AUTHENTICATED
U.S. GOVERNMENT
INFORMATION
GPO

THE REGULATION OF DIETARY SUPPLEMENTS: A REVIEW OF CONSUMER SAFEGUARDS

HEARING

BEFORE THE

COMMITTEE ON GOVERNMENT REFORM

HOUSE OF REPRESENTATIVES

ONE HUNDRED NINTH CONGRESS

SECOND SESSION

MARCH 9, 2006

Serial No. 109–135

Printed for the use of the Committee on Government Reform

Available via the World Wide Web: http://www.gpoaccess.gov/congress/index.html
http://www.house.gov/reform

U.S. GOVERNMENT PRINTING OFFICE

27–187 PDF WASHINGTON : 2006

For sale by the Superintendent of Documents, U.S. Government Printing Office
Internet: bookstore.gpo.gov Phone: toll free (866) 512–1800; DC area (202) 512–1800
Fax: (202) 512–2250 Mail: Stop SSOP, Washington, DC 20402–0001

COMMITTEE ON GOVERNMENT REFORM

TOM DAVIS, Virginia, *Chairman*

CHRISTOPHER SHAYS, Connecticut
DAN BURTON, Indiana
ILEANA ROS-LEHTINEN, Florida
JOHN M. MCHUGH, New York
JOHN L. MICA, Florida
GIL GUTKNECHT, Minnesota
MARK E. SOUDER, Indiana
STEVEN C. LATOURETTE, Ohio
TODD RUSSELL PLATTS, Pennsylvania
CHRIS CANNON, Utah
JOHN J. DUNCAN, JR., Tennessee
CANDICE S. MILLER, Michigan
MICHAEL R. TURNER, Ohio
DARRELL E. ISSA, California
JON C. PORTER, Nevada
KENNY MARCHANT, Texas
LYNN A. WESTMORELAND, Georgia
PATRICK T. MCHENRY, North Carolina
CHARLES W. DENT, Pennsylvania
VIRGINIA FOXX, North Carolina
JEAN SCHMIDT, Ohio

HENRY A. WAXMAN, California
TOM LANTOS, California
MAJOR R. OWENS, New York
EDOLPHUS TOWNS, New York
PAUL E. KANJORSKI, Pennsylvania
CAROLYN B. MALONEY, New York
ELIJAH E. CUMMINGS, Maryland
DENNIS J. KUCINICH, Ohio
DANNY K. DAVIS, Illinois
WM. LACY CLAY, Missouri
DIANE E. WATSON, California
STEPHEN F. LYNCH, Massachusetts
CHRIS VAN HOLLEN, Maryland
LINDA T. SANCHEZ, California
C.A. DUTCH RUPPERSBERGER, Maryland
BRIAN HIGGINS, New York
ELEANOR HOLMES NORTON, District of Columbia

BERNARD SANDERS, Vermont (Independent)

DAVID MARIN, *Staff Director*
TERESA AUSTIN, *Chief Clerk*
PHIL BARNETT, *Minority Chief of Staff/Chief Counsel*

CONTENTS

	Page
Hearing held on March 9, 2006	1
Statement of:	
Brackett, Robert E., Ph.D., Director, Center for Food Safety and Applied Nutrition, Food and Drug Administration, U.S. Department of Health and Human Services; Paul M. Coates, Ph.D., Director, Office of Dietary Supplements, National Institutes of Health; and C. Lee Peeler, Deputy Director, Bureau of Consumer Protection, Federal Trade Commission	24
Brackett, Robert E.	24
Coates, Paul M.	45
Peeler, C. Lee	62
Jordan, Kathleen, MS, RD, general manager, Dietary Supplement Certification Program, on behalf of NSF International; V. Srini Srinivasan, Ph.D, vice president, Verification Program, U.S. Pharmacopeia Convention, Inc.; Tod Cooperman, M.D., president and founder, Consumerlab.com; and Janell Mayo Duncan, senior counsel, Consumers Union of U.S. Inc.	96
Cooperman, Tod	184
Duncan, Janell Mayo	189
Jordan, Kathleen	96
Srinivasan, V. Srini	173
Letters, statements, etc., submitted for the record by:	
Brackett, Robert E., Ph.D., Director, Center for Food Safety and Applied Nutrition, Food and Drug Administration, U.S. Department of Health and Human Services, prepared statement of	27
Burton, Hon. Dan, a Representative in Congress from the State of Indiana, prepared statement of	217
Cannon, Hon. Chris, a Representative in Congress from the State of Utah, prepared statement of	16
Coates, Paul M., Ph.D., Director, Office of Dietary Supplements, National Institutes of Health, prepared statement of	47
Cooperman, Tod, M.D., president and founder, Consumerlab.com, prepared statement of	187
Cummings, Hon. Elijah E., a Representative in Congress from the State of Maryland, prepared statement of	220
Davis, Chairman Tom, a Representative in Congress from the State of Virginia, prepared statement of	4
Duncan, Janell Mayo, senior counsel, Consumers Union of U.S. Inc., prepared statement of	191
Jordan, Kathleen, MS, RD, general manager, Dietary Supplement Certification Program, on behalf of NSF International, prepared statement of	99
Peeler, C. Lee, Deputy Director, Bureau of Consumer Protection, Federal Trade Commission, prepared statement of	64
Srinivasan, V. Srini, Ph.D, vice president, Verification Program, U.S. Pharmacopeia Convention, Inc., prepared statement of	175
Watson, Hon. Diane E., a Representative in Congress from the State of California, prepared statement of	20
Waxman, Hon. Henry A., a Representative in Congress from the State of California, prepared statement of	9

THE REGULATION OF DIETARY SUPPLEMENTS: A REVIEW OF CONSUMER SAFEGUARDS

THURSDAY, MARCH 9, 2006

HOUSE OF REPRESENTATIVES,
COMMITTEE ON GOVERNMENT REFORM,
Washington, DC.

The committee met, pursuant to notice, at 10:47 a.m., in room 2154, Rayburn House Office Building, Hon. Tom Davis (chairman of the committee) presiding.

Present: Representatives Tom Davis, Gutknecht, Platts, Cannon, Miller, Issa, Dent, Schmidt, Waxman, Maloney, Cummings, Watson, Van Hollen, Ruppersberger, and Norton.

Also present: Representative Davis of California.

Staff present: Jennifer Safavian, chief counsel for oversight and investigations; Michael Sazonov, research assistant and legislative correspondent; Sarah D'Orsie, deputy clerk; Phil Barnett, minority staff director/chief counsel; Sarah Despres and Tony Haywood, minority counsels; Earley Green, minority chief clerk; and Jean Gosa, minority assistant clerk.

Chairman TOM DAVIS. The committee will come to order.

Good morning. Welcome to today's Government Reform Committee hearing on dietary supplements.

A little more than a year ago, this committee launched a bipartisan investigation into the use of steroids and performance-enhancing drugs in Major League Baseball and other professional sports. One of the results of that investigation was baseball's adoption of stricter penalties for steroid use and new penalties for the use of illegal stimulants.

Our steroids inquiry also led us in a direction we had not anticipated and that is one reason we find ourselves here today, taking a closer look at the massive and fast-growing dietary supplement industry. By some recent estimates, dietary supplements are a $20 billion industry a year. The Food and Drug Administration counts 29,000 dietary supplements on the market today, up nearly 20 percent from a decade ago. A 2004 government survey showed nearly 60 percent of Americans take dietary supplements regularly.

Despite the vast size of the industry and the obvious popularity of supplements with American consumers, I fear there remains great and potential confusion over how closely the government regulates these supplements. Consumers mistakenly believe supplements are regulated like pharmaceutical drugs, but that is simply not the case. For example, according to a 2002 Harris Poll, 68 per-

cent of American adults believe the Federal Government requires supplements to carry warning labels about potential side effects. Not true. The poll shows 59 percent of people believe supplements must be approved by a government agency like the Food and Drug Administration before they can be sold. Not true. And 55 percent of people believe supplement manufacturers are not permitted to make claims regarding safety without solid scientific evidence. Again, not true.

Today, we are here to learn the facts about the exact responsibility of the Federal Government in regulating dietary supplements and what role is played by independent groups such as the NSF International, U.S. Pharmacopeia, and Consumerlab.com who either independently test supplements or will certify supplements on behalf of the manufacturers. Just as important, we want to understand how this information is conveyed, if at all, to consumers. We have millions of Americans buying products, many under the false assumption that the items have been approved for use by the FDA.

Are all supplements dangerous? Of course not. But are all of them perfectly safe for everyone to take? Again, of course not. Just look at ephedra. The FDA in 2004 banned its use in dietary supplements citing concerns over its cardiovascular effects, including increased blood pressure and irregular heart rhythm. The action was spurred in part by the death of the Baltimore Orioles pitcher, Steve Belcher who had been taking ephedra.

For years there was concern, even with the FDA, that ephedra was dangerous. Ephedra and its variants were the first dietary supplement banned for sale by the FDA under the 1994 Dietary Supplement Health and Education Act [DSHEA]. Under this law, dietary supplement manufacturers don't need FDA approval before manufacturing, labeling, distributing, and marketing their products. FDA's regulation of dietary supplements is primarily a post-market program. For supplements that don't contain the new dietary ingredient, that is a dietary ingredient that was not sold in the United States before October 15, 1994, there is no requirement for manufacturers to provide FDA with evidence about the safety of the product either before or after marketing.

While DSHEA does require manufacturers to label their product as a supplement and include a full list of ingredients, manufacturers are not required to alert FDA to adverse event reports they may receive from consumers. Further, the law requires FDA to prove a significant and unreasonable risk to health before a dietary supplement can be removed from a shelf.

In some cases, the regulatory gaps in the law have been filled by the private sector. Our second panel of witnesses today will explain how their organizations test supplements and in some cases certify that the manufacturer is accurately listing the ingredients on the label. One of these groups, NSF International, helped create a national packaging standard for supplements and now works with the NFL and Major League Baseball to certify that the supplements don't contain banned substances such as performance-enhancing drugs. I find this telling, that millionaire athletes with topnotch athletic trainers on staff need to resort to third parties to let them know which supplements are safe to take and which are not be-

cause they might unexpectedly and illegally contain performance-enhancing drugs.

What is the average consumer to do? How many of these 29,000 supplements really contain what they claim? How many truly have an exhaustive list of all the ingredients on their labels?

The Washington Post highlighted this problem in an October 18, 2005 article for which the newspaper purchased five dietary supplements, all labeled as muscle-builders and all available through the Internet who have been tested by the UCLA Olympic Analytical Laboratory for anabolic steroids. All five tested positive for what are commonly known as designer steroids. Moreover, just 2 weeks ago, the FDA announced that $3 million worth of products containing ephedrine alkaloids were seized from High-Tech Pharmaceuticals, a Georgia company that was manufacturing and selling three dietary supplements containing the banned substance.

Just yesterday, two staff members of this committee were able to walk into a health food store near Capitol Hill and purchase two separate products, both marketed as weight loss supplements. These labels list ephedrine alkaloids as a key ingredient. Our staff has also been able to find nearly a dozen Internet sites offering to sell supplements containing ephedra. Clearly, we have questions about how effective the ban on ephedra has been in actually keeping these products off the market.

I hope today's hearing will be able to shed more light on this enormous industry and that we learn a bit more about how consumers can protect themselves. We will start our discussion with a panel of witnesses from the three Federal agencies that exercise jurisdiction over this field: The FDA, the National Institutes of Health, and the Federal Trade Commission. I very much look forward to hearing your testimony as well as that of our second panel.

[The prepared statement of Chairman Tom Davis follows:]

Chairman Tom Davis
Committee on Government Reform
Opening Statement
"The Regulation of Dietary Supplements: A Review of Consumer Safeguards"
March 9, 2006

Good morning and welcome to today's Government Reform Committee hearing on dietary supplements.

A little more than a year ago, the Committee launched a bipartisan investigation into the use of steroids and performance-enhancing drugs in Major League Baseball and other professional sports. One of the results of that investigation was baseball's adoption of stricter penalties for steroid use and new penalties for the use of illegal stimulants.

But our steroids inquiry also led us in directions we had not anticipated, and that's one reason we find ourselves here today, taking a closer look at the massive and fast-growing dietary supplement industry.

By some recent estimates, dietary supplements are a $20 *billion* a year industry. The Food and Drug Administration counts 29,000 dietary supplements on the market today, up nearly 20 percent from a decade ago. A 2004 government survey showed nearly 60 percent of Americans take dietary supplements regularly.

Despite the vast size of this industry and the obvious popularity of supplements with American consumers, I fear that there remains great – and potentially dangerous – confusion over how closely the government regulates these supplements. Consumers mistakenly believe supplements are regulated like pharmaceutical drugs, but that is simply not the case.

For example, according to a 2002 Harris Poll survey, 68 percent of American adults believe the federal government requires supplements to carry warning labels about potential side effects.

Not true.

The poll showed 59 percent of people believe supplements must be approved by a government agency, like the Food and Drug Administration, before they can be sold.

Not true.

And, 55 percent of people believe supplement manufacturers were not permitted to make claims regarding safety without solid scientific evidence.

Again, not true.

Today, we are here to learn the facts about the exact responsibility of the federal government in regulating dietary supplements. And what role is played by independent groups such as NSF International, U.S. Pharmacopeia, and Consumerlab.com., who either independently test supplements or will certify supplements on behalf of the manufacturers.

And just as important, we want to understand how this information is conveyed – if at all – to the consumer. We have millions of Americans buying products, many under the false assumption that the items have been approved for use by the FDA.

Are all supplements dangerous? Hardly. But are all of them perfectly safe for everyone to take? Of course not. Just look at ephedra. The FDA in 2004 banned its use in dietary supplements, citing concerns over its cardiovascular effects, including increased blood pressure and irregular heart rhythm. The action was spurred in part by the death of Baltimore Orioles pitcher Steve Belcher, who had been taking ephedra. But for years there was concern, even at the FDA, that ephedra was dangerous.

Ephedra and its variants were the first dietary supplement banned for sale by the FDA under the 1994 Dietary Supplement Health and Education Act, known as DSHEA (Da-SHAY). Under this law, dietary supplement manufacturers do not need FDA approval before manufacturing, labeling, distributing, and marketing their products. FDA's regulation of dietary supplements is primarily a post-market program. For supplements that do not contain a new dietary ingredient – that is, a dietary ingredient that was not sold in the United States before October 15, 1994 – there is no requirement for manufacturers to provide FDA with evidence about the safety of the product either before or after marketing.

While DSHEA does require manufacturers to label their product as a "supplement" and include a full list of ingredients, manufacturers are not required to alert FDA to adverse event reports they may receive from consumers. Furthermore the law requires FDA to prove "a significant and unreasonable risk to health" before a dietary supplement can be removed from the shelves.

In some cases, the regulatory gaps in the law have been filled by the private sector. Our second panel witnesses today will explain how their organizations test supplements and in some cases certify that the manufacturer is accurately listing the ingredients on the label.

One of these groups, NSF International, helped create national packaging standards for supplements and now works with the NFL and Major League Baseball to certify that supplements do not contain banned substances such as performance-enhancing drugs.

I find this telling – that millionaire athletes, with top-notch athletic trainers on staff, need to resort to a third party to let them know which supplements are safe to take and which are not, because they might unexpectedly (and illegally) contain performance-

enhancing drugs. What is the average consumer to do? How many of those 29,000 supplements really contain what they claim? How many truly have an exhaustive list of all ingredients on their labels?

The *Washington Post* highlighted this problem in an October 18, 2005 article, for which the newspaper purchased five dietary supplements, all labeled as muscle builders and all available over the Internet, and had them tested by the UCLA Olympic Analytical Laboratory for anabolic steroids. All five tested positive for what are commonly known as "designer steroids."

Moreover, just two weeks ago, the FDA announced that $3 million worth of products containing ephedrine alkaloids were seized from Hi-Tech Pharmaceuticals, a Georgia company that was manufacturing and selling three dietary supplements containing the banned substance.

I hope today's hearing will be able to shed more light on this enormous industry, and that we learn a bit more about how consumers can protect themselves. We will start our discussion with a panel of witnesses from the three federal agencies that exercise some jurisdiction over this field – the FDA, the National Institutes of Health and the Federal Trade Commission, and I very much look forward to hearing their testimony, as well as that of our second panel.

Chairman TOM DAVIS. I will now recognize the distinguished ranking member, Mr. Waxman, for an opening statement.

Mr. Waxman.

Mr. WAXMAN. Mr. Chairman, thank you for very much for holding this hearing today concerning what safeguards exist to protect the public from potentially dangerous dietary supplements. Most supplements are safe, but there are some on the market that pose risks. Unfortunately, the 1994 law known as the Dietary Supplement Health and Education Act [DSHEA], made it very difficult for the FDA to act and to provide meaningful protection against unsafe products. The problem of effective oversight has been compounded by the underfunding of the Center for Freedom Safety and Applied Nutrition at the FDA.

Today we are going to hear about the work of private companies that have stepped in to provide consumers with the assurance that the products they are taking are at a minimum not contaminated. The companies represented here today provide a valuable service. These companies test and certify that supplements are pure and contain the ingredients listed on the label in the amounts listed on the label. Such certification is important to pregnant women who are taking folic acid to minimize the risk of birth defects, who want assurances that the pill they are taking actually has folic acid in the necessary amounts and it does not contain anything potentially harmful, such as lead or arsenic. For an athlete who is taking a dietary supplement product marketed as steroid-free confirmation that the supplement does not contain steroids can mean the difference between passing a drug test or failing one.

While a company has to certify that a dietary supplement is pure, that doesn't mean the product is necessarily safe or effective. That is because unlike the review it conducts for drugs and medical devices, FDA does not conduct a pre-market review of dietary supplements to determine whether they pose a serious health hazard and the claims on the logos are true.

Understandably, consumers are confused about how dietary supplements are regulated. A 2002 Harris poll found that 59 percent of consumers believe that supplements have to be approved before they can been be marketed. It is just not true, and the chairman cited other polls to that effect. It seems that consumers do not understand that even when a product that has been certified as pure, the product may be ineffective and may even pose a health risk.

Most dietary supplement products do not pose health risks, but FDA does not have strong enough authority to take swift action to protect consumers against those products that are unsafe. Unfortunately, FDA lacks the legal authority and political backing it needs to protect the public. An example of this is in the case of the dietary supplement ephedra. FDA amassed thousands and thousands of adverse event reports, including a number of reports of very serious injuries such as heart attack, stroke, and death. Experts concluded that ephedra-containing products were likely causing serious injury and should be taken off the market.

Despite the evidence of harm, it took FDA years before it took ephedra off the market. Even now the FDA ban on ephedra is being litigated and FDA had to go the great lengths to amass these documents and evidence because they felt that they had to prove

this case so clearly that it could be sustained in these attacks by the industry in courts that they are now fighting to maintain today.

What the ephedra story makes clear is that it is very difficult for the FDA to protect consumers against unsafe dietary supplement products, and that is why Representative Susan Davis, Representative John Dingle, and I have introduced H.R 3156, the Dietary Supplement Access and Awareness Act. To those who are concerned that this bill will take away Vitamin C or will allow FDA to ban a dietary supplement on the basis of a single adverse event report, let me reassure you that this is not the case. This bill would not change the regulation of vitamins and minerals at all.

What the bill would do is to require dietary supplement companies to report to FDA adverse health consequences associated with their products. If these adverse event reports signal that there might be a problem with a supplement, FDA would have the authority to require that the company demonstrate that their product is safe. Responsible dietary supplement companies that market safe products should not find that requirement an undue burden.

The bill would also give the FDA enhanced authority over dietary supplement products marketed for kids. As we learned in our investigation of steroids in sports, kids are taking supplements to try to enhance their athletic performance. It is very important that these products do not pose a significant risk to them.

I am pleased that we are also hearing today from Consumers Union which does great work educating the public about dietary supplements through their magazine Consumer Reports, and I also look forward to the testimony of our government witnesses about the work they are doing to help consumers understand which supplements are safe and which ones may not be. I don't think we ought to allow the marketplace to be that the consumer bears the risks, the buyer beware, if it doesn't work out, that is just too bad, the consumers should know better and then the information is kept from them and the government agency that one would think of as protecting the public and the consumers has no real authority to do anything about the problem.

I thank the witnesses for coming today. I look forward to their testimony. This is a very important hearing, and I am pleased, Mr. Chairman, that you called it.

[The prepared statement of Hon. Henry A. Waxman follows:]

Statement of Rep. Henry A. Waxman, Ranking Minority Member
Committee on Government Reform
Hearing on
"The Regulation of Dietary Supplements: A Review of Consumer Safeguards"

March 9, 2006

Mr. Chairman, thank you for holding this hearing today concerning what safeguards exist to protect the public from potentially dangerous dietary supplements. Most supplements are safe, but there are some on the market that pose risks. Unfortunately, the 1994 law known as the Dietary Supplement Health and Education Act, or "DSHEA," made it very difficult for FDA to provide meaningful protection against unsafe products. The problem of effective oversight has been compounded by underfunding of the Center for Food Safety and Applied Nutrition at FDA.

Today we will hear about the work of private companies that have stepped in to provide consumers with the assurance that the products that they are taking are, at a minimum, not contaminated. The companies represented here today provide a valuable service. These companies test and certify that supplements are pure and contain the ingredients listed on the label in the amounts listed on the label.

Such certification is important for pregnant women taking folic acid to minimize the risks of birth defects, who want assurance that the pill they are taking actually has folic acid in the necessary amounts, and that it does not contain anything potentially harmful, such as lead, or arsenic. For an athlete who is taking a dietary supplement product marketed as steroid-free, confirmation that the supplement does not contain steroids can mean the difference between passing a drug test and failing one.

But even where a company has certified that a dietary supplement is pure, the product is not necessarily safe and effective. That is because, unlike the review it conducts for drugs and medical devices, FDA does not conduct a pre-market review of dietary supplements to determine whether they pose a serious health hazard and the claims on the labels are true.

Understandably, consumers are confused about how dietary supplements are regulated. A 2002 Harris Poll found that 59% of consumers believed that supplements have to be approved before they can be marketed. I received a letter recently from a clinician at Johns Hopkins University who surveyed patients at three different clinics in Baltimore about their understanding of dietary supplement regulation. Over half of the people he surveyed either believed that supplements

were approved by the FDA or were unsure whether the product was approved.

It seems that consumers do not understand that even when a product that has been certified as pure, the product may be ineffective and may pose health risks.

Most dietary supplement products do not pose health risks. But FDA does not have strong enough authority to take swift action to protect consumers against those products that are unsafe. Unfortunately, FDA lacks the legal authority – and political backing – it needs to protect the public.

In the case of one popular dietary supplement, ephedra, FDA amassed thousands and thousands of adverse event reports, including a number of reports of very serious injuries such as heart attack, stroke and death. Experts concluded that ephedra-containing products were likely causing serious injury and should be taken off of the market. Despite evidence of harm, it took FDA years before it took ephedra off of the market. Even now, the FDA ban on ephedra is being litigated.

What the ephedra story makes clear is that it is very difficult for FDA to protect consumers against unsafe dietary supplement products.

This is why Rep. Susan Davis, Rep. Dingell, and I have introduced H.R. 3156, the Dietary Supplement Access and Awareness Act.

To those who are concerned that this bill would take away vitamin C, or would allow FDA to ban a dietary supplement on the basis of a single adverse event report, let me reassure you that this is not the case. This bill would not change the regulation of vitamins and minerals at all.

What the bill would to is to require dietary supplement companies to report to FDA adverse health consequences associated with their products. If these adverse event reports signal that there might be a problem with a supplement, FDA would have the authority to require that the company demonstrate that their product is safe. Responsible dietary supplement companies that market safe products should not find this requirement an undue burden.

The bill would also give FDA enhanced authority over dietary supplement products marketed for kids. As we learned in our investigation of steroids and sports, kids are taking supplements to try to enhance their athletic performance. It is very important that these products do not pose a significant risk to them.

I am pleased that we are also hearing today from Consumers Union, which does great work educating the public about dietary supplements through their magazine, *Consumer Reports*. And I also look forward to the testimony of our government witnesses about the work they are doing to help consumers understand which supplements are safe and which ones may not be.

I thank the witnesses for coming today and I look forward to their testimony.

Chairman TOM DAVIS. Thank you very much, Mr. Waxman.

Mr. Cannon.

Mr. CANNON. Thank you, Mr. Chairman. In the first place, let me just say that I very much appreciate this hearing. First let me ask unanimous consent that my written statement be included in the record.

Chairman TOM DAVIS. Without objection.

Mr. CANNON. Thank you.

I would like to make orally here just a couple of points. The first is that the industry is complex. You have good players and you have bad players, and as the chairman knows, a large portion of this industry is in my district. The vast majority of those, this is not a testimonial, but I think are good players and are very concerned about the issues that are raised. I would like to talk about those issues just briefly.

In the first place, supplements have a different history from pharmaceuticals and truly ought to be treated differently, but both you and the ranking member raised really important points. We talk about steroids and drugs that your staff or staff of this committee has been able to buy off the shelf or online. I just want to point out if a supplement has steroids in it that are prohibited, that is a crime that needs to be prosecuted. You have products that have ephedra that the staff have been able to obtain. Having products with ephedra in it today, I think is a crime despite the fact that there is some litigation about the process by which ephedra was determined to be inappropriate.

So I don't think there is going to be any question that we ought to be enforcing the law, and I think Mr. Waxman made the point that the funding for enforcement is very important. It is important to the good players in the industry.

While both you and the ranking member talked about either premarket review or only having a post-market program, that I think is inherent in nature, but it goes to the core problem of what kind of products are we getting. When you buy a supplement that says, say, Vitamin C, which I can't stand and the nice thing about our market today is I don't have to buy Vitamin C, but if it is a market that has some purported content, it needs to be labeled, that is consumers need to have some assurance that what they are getting is what they are buying.

So we are anxious to see the good manufacturing practices rules promulgated so we can have a standard out there. It has been so long since they were first proposed that maybe we ought to be looking at some kind of a re-proposal or something so that we have those out there; but, in fact, I don't think there is any question among the good suppliers that we ought to have adverse event reports as well. So I think that set of issues is important.

The second point I would like to make is we are on the brink of an incredibly different future and what we do in this committee is very, very important. We have never lived in a world where the cost of decoding DNA has plummeted like it has over the last few years. We have six orders of magnitude of reduced cost in how we decode DNA, and this year we just finished decoding the HAP map or the HAP locks of the DNA code. That is going to have terrific implications for how we understand metabolic pathways and the

compounds in these supplements that are actually helpful and how those affect the metabolic pathways, and the cost of computerization has plummeted. BYU, a relatively small private university had the sixth largest super computer in the world for a period of time. It cost a lousy $20 million. We are in a world where computing, massive, massive computing, has transformed the nature of health care, and so I just think it is vital that this committee is thoughtful, responsive, careful about these issues and how they are presented so what we don't do is get in the way of the kind of technological wave that I think is going to transform health care and allow us to do things with supplements that would be much better than what we can do in some cases with drugs.

So with those two points, Mr. Chairman, I appreciate the hearing. I appreciate you holding it today and I yield back.

[The prepared statement of Hon. Chris Cannon follows:]

Opening Statement
Congressman Cannon
Committee on Government Reform
"The Regulation of Dietary Supplements: A Review of Consumer Safeguards" Hearing
March 9, 2006

Mr. Chairman, thank you for holding this hearing. Today's hearing discusses an issue of great interest and importance to me. I am the founder and a co-chair of the Dietary Supplement Caucus here in the House of Representatives. Not only that, I take dietary supplements daily to promote my health and have noticed the health benefits that come with doing so. As one of the 178 million Americans taking some type of dietary supplement, I hope we can leave today better educated about dietary supplement regulation.

Today we will be discussing dietary supplement regulation and DSHEA. I believe consumers should have information available to them so they may be assisted in making wise and thoughtful decisions. I also believe that Americans are responsible individuals who should have the freedom to make their own health assessment as to what they do or do not do to promote their health. Many, like myself, take dietary supplements in order to meet their nutritional needs as well as for prevention and health promotion purposes. Mr. Chairman, as you may relate, sometimes the demands of a member of Congress, unfortunately, do not permit the opportunity to receive all the nutritional requirements as recommended by the USDA. In fact, according to the USDA Dietary Guidelines for Americans:

> *Sometimes supplements are needed to meet specific nutrient requirements. For example, older people and others with little exposure to sunlight may need a vitamin D supplement.*

Women of childbearing age may reduce the risk of certain birth defects by consuming folate-rich foods or folic acid supplements. Iron supplements are recommended for pregnant women. However, because foods contain many nutrients and other substances that promote health, the use of supplements cannot substitute for proper food choices.

I'm sure we all agree that the best source of vitamins and minerals is through natural food sources. However, most Americans are deficient in some nutrients and therefore, benefit from supplements. The CDC reported that almost 75 percent of Americans do not consumer the government recommended five to nine servings of fruits and vegetables each day.

Although, I am a supporter of the dietary supplement industry, I certainly am not a supporter of the illegal use of steroids or illegal drugs marketed as dietary supplements. Let me make it clear that anabolic steroids are not a dietary supplement, regardless of whether or not they are marketed as such. I believe that there needs to be a clear distinction.

Mr. Chairman, I appreciate the lead you have taken to address the abuse of illegal use of steroids in athletics. Those who use illegal drugs are committing a crime and should be punished accordingly. Unfortunately, those who have abused these drugs have tainted the dietary supplement industry, of which millions have achieved better health from. Even the U.S. Food and Drug Administration, the agency that regulates dietary supplements, acknowledges that just because a steroid-or any other product- is marketed as a dietary supplement doesn't make it one. As I see it, we don't have a problem with dietary supplement regulation or safety, rather we have a problem with anabolic steroid enforcement.

The drugs that were tested positive for steroids in the October 18, 2005 Washington Post article, which has been referenced, were

marketed as performance enhancers and were purchased online, a sales channel that comprises less than three percent of the dietary supplement market. Americans should not be led to believe that dietary supplements are under regulated.

The Dietary Supplement Health and Education Act (DSHEA), which became law in 1994, provides the FDA with the necessary enforcement of dietary supplements. Under DSHEA, the FDA has the power to seize a supplement if it poses an "unreasonable or significant risk of illness or injury" as well as stop the sale of an entire class of dietary supplements if they pose an imminent public health hazard. DSHEA grants the FDA authority to terminate marketing of a new dietary ingredient if the agency has not received sufficient data in advance. Additionally, DSHEA required the FDA to implement strict Good Manufacturing Practices (GMP), which the agency still has not come out with- I feel that the industry has waited long enough, and I look forward to hearing from the FDA as to where we are at in this process.

I believe that consumers are protected under DSHEA, and it is the abuse of a very few corrupt companies that have wrongly implicated a legitimate industry. What we don't need to do today is to amend DSHEA, which has proven to be an effective law for regulating the industry. But what we do need to do is to have agencies come up with a unified and effective steroid policy and plan.

We are continually learning more about dietary supplements and that trend will continue. Supplements can be one inexpensive factor for Americans in obtaining full optimal health.

I look forward to hear from our witnesses. Thank you all for coming today. With that, I yield back the balance of my time.

Chairman TOM DAVIS. Thank you very much.

Any other opening statements, Members?

Ms. Watson.

Ms. WATSON. I have an opening statement. That bell is for a vote. So let me submit my statement, Mr. Chairman.

Chairman TOM DAVIS. That would be great.

[The prepared statement of Hon. Diane E. Watson follows:]

Opening Statement
Congresswoman Diane E. Watson
Government Reform Committee
Full Committee Hearing
Hearing: "The Regulation of Dietary Supplements: A Review of Consumer Safeguards"

Mr. Chairman, thank you for holding this important hearing. Many nutritionists feel that natural foods and supplements are very beneficial in developing a healthy population. If one understands everything that goes into their body, it should be possible to live a healthier and more productive life. The key is that whatever product someone consumes, they should know the facts about the contents. This has not totally been the case in the dietary supplement industry.

There are some supplements that have proven to be effective. For example, pregnant women are advised to take folic acid to reduce certain birth defects, and

calcium supplements have been demonstrated to reduce the risk of osteoporosis. While these supplements have been effective along with several others, there is room to do much more in the area of regulation and research initiated by the natural food and supplement industry. These industries, in conjunction with the Food and Drug Administration (FDA), should test products carefully.

The dietary supplement market has flourished into a $20 billion industry. The Dietary Supplement Health and Education Act of 1994 should be reevaluated. Under this law, the FDA has no authority to approve, or even to evaluate dietary supplements before they are marketed. In the pharmaceutical industry, prescription drugs are studied by the FDA and pharmaceutical

companies before they even allow humans to consume them for testing purposes.

Mr. Chairman, over the past few years there have been several media stories of supplements causing adverse effects. Some athletes have even stated that they took supplements that they thought were safe when reading the ingredients, but ended up causing them to test positive for steroids and other performance enhancing drugs. For the safety and good of our constituents, we must work to keep track of what products are being sold and what danger and harm each one presents.

I want to thank the witnesses for coming and testifying so Congress can understand the problems in regulating this industry. With 50-60% of the American public consuming supplements on a regular basis, this is

a problem that needs to be addressed quickly. The point is not to add more bureaucratic triangles to the industry; it is to make sure that what consumers know they are purchasing is what they get, nothing more and nothing less.

I yield back

Chairman TOM DAVIS. Ms. Norton.

Ms. NORTON. Is that the bell for a vote?

Chairman TOM DAVIS. Yes, it is. It is the previous question and it may be two votes. I will try to keep this going.

Ms. NORTON. All right.

Chairman TOM DAVIS. Why don't I swear in this our first panel? Members will have 7 days to submit opening statements for the record.

I am going to recognize our first panel. We are pleased to have today Dr. Robert Brackett, the Director of the Center for Food Safety and Applied Nutrition at the Food and Drug Administration; Dr. Paul Coates, the Director of the Office of Dietary Supplements, National Institutes of Health; and Mr. Lee Peeler, who is the Deputy Director of the Bureau of Consumer Protection for the Federal Trade Commission.

It is our policy that we swear witnesses in before you testify. So if you would rise, please, and raise your right hands.

[Witnesses sworn.]

Chairman TOM DAVIS. Thank you very much.

Thank you for being with us.

STATEMENTS OF ROBERT E. BRACKETT, Ph.D., DIRECTOR, CENTER FOR FOOD SAFETY AND APPLIED NUTRITION, FOOD AND DRUG ADMINISTRATION, U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES; PAUL M. COATES, Ph.D., DIRECTOR, OFFICE OF DIETARY SUPPLEMENTS, NATIONAL INSTITUTES OF HEALTH; AND C. LEE PEELER, DEPUTY DIRECTOR, BUREAU OF CONSUMER PROTECTION, FEDERAL TRADE COMMISSION

STATEMENT OF ROBERT E. BRACKETT

Dr. BRACKETT. Thank you, Mr. Chairman and members of the committee. I am Dr. Robert Brackett, Director of FDA's Center for Food Safety and Applied Nutrition, and I do appreciate the opportunity to participate in today's hearing as the committee considers the regulation of dietary supplements and related consumer safeguards.

I do want to assure the members of the committee and the American public that FDA is committed to dietary supplement safety. Many Americans take some type of dietary supplement, and in some cases, there is evidence that these vitamins and minerals and other products could offer important health benefits. The Dietary Supplement Health and Education Act of 1994, otherwise DSHEA, amended the Food, Drug and Cosmetic Act, or FD&C Act, to set up a distinct regulatory framework for these products. DSHEA is intended to strike the right balance between providing consumers access to safe dietary supplements that they might choose to help maintain and improve their health and giving FDA the regulatory authority to take action against supplements and supplement ingredients that prevent safety problems or if they have false or misleading claims or are otherwise adulated or misbranded.

DSHEA defined the term "dietary supplement" as a food that, among other things, is intended for ingestion, is intended to supplement the diet, is labeled as a dietary supplement, is not rep-

resented as a conventional food or as a sole item in a meal or diet and contains one or more so-called dietary ingredients. Dietary supplements may be found in many forms such as tablets, capsules, powders, liquids, or bars. By law, the label of the dietary supplement must first identify the product as a dietary supplement, provide nutrition information in the form of supplement facts, list separately any ingredients not listed in the supplement facts panel, provide the name and address of the manufacturer, packager, distributor, and state the net quantity of contents.

Importantly, if the labeling includes a claim related to an affect on the structure or function of the body, a claim of general being or a claim of benefit related to the classical nutrient deficiency disease, that product must bear a disclaimer stating that FDA has not evaluated the claim and that the product is not intended to diagnose, treat, cure, or prevent any disease. Furthermore, a manufacturer of a dietary supplement making a claim must have substantiation that the claim is truthful, is not misleading, and must notify FDA that its product bears such a claim within 30 days of marketing the product with the claim.

As with most foods, there is no requirement for manufacturers of most dietary supplements to provide evidence of product safety to FDA prior to marketing. Accordingly, FDA regulates the safety of dietary supplements primarily through a post-market evaluation of whether the product is adulterated or misbranded under the provisions of FD&C Act. If the product contains a new dietary ingredient that is an ingredient that wasn't marketed in the United States before October 15, 1994, then the FD&C Act requires that the manufacturer or distributor notify FDA 75 days prior to the marketing of the dietary supplement containing the new dietary ingredient unless the new dietary ingredient has been present without chemical alteration in the food supply as an article used in food.

The notification must include the information upon which the manufacturer or distributor has based its conclusion that the dietary supplement containing the new ingredient will reasonably be expected to be safe. Failure to notify the agency when required causes the product to be considered adulterated under the FD&C Act.

Other regulatory and surveillance tools that the agency uses to address dietary supplements includes: First, a voluntary adverse event reporting system that can track, evaluate, and monitor adverse events, scientific research about the safety of dietary supplements, and, additionally, the agency has been working to inform consumers about dietary supplements and their uses by making available more scientifically accurate information about these dietary products so that Americans know the truth and consequences of what they consume. Tied to this is a commitment to bring enforcement actions against those who market unsafe dietary supplements or make false or misleading claims.

This morning, I would like to highlight our most recent enforcement action, which was to send forewarning letters to manufacturers or distributors of steroid-containing products marketed as dietary supplements. The agency's enforcement actions send a clear message that FDA will not tolerate fraudulent practices that victimize and endanger consumers.

Mr. Chairman, thank you for the opportunity to testify, and I do look forward to answering any questions that you might have.

[The prepared statement of Mr. Brackett follows:]

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Food and Drug Administration
Rockville MD 20857

STATEMENT OF

ROBERT E. BRACKETT, Ph.D., DIRECTOR

CENTER FOR FOOD SAFETY AND APPLIED NUTRITION
FOOD AND DRUG ADMINISTRATION
U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

BEFORE THE

COMMITTEE ON GOVERNMENT REFORM
HOUSE OF REPRESENTATIVES

MARCH 9, 2006

FOR RELEASE ONLY UPON DELIVERY

INTRODUCTION

Thank you, Mr. Chairman for this opportunity to testify before your Committee at this hearing entitled, "The Regulation of Dietary Supplements: A Review of Consumer Safeguards."

BACKGROUND ON REGULATION OF DIETARY SUPPLEMENTS

Many Americans take some type of dietary supplement, and in some cases, there is evidence that these vitamins and minerals and other products could offer important health benefits. The Dietary Supplement Health and Education Act (DSHEA) of 1994 (P.L. 103-417) amended the Federal Food, Drug, and Cosmetic (FD&C) Act to set up a distinct regulatory framework for these products. DSHEA is intended to strike the right balance between providing consumers access to safe dietary supplements that they may choose to help maintain and improve their health, and giving the Food and Drug Administration (FDA or the Agency) regulatory authority to take action against supplements and supplement ingredients that present safety problems, have false or misleading claims, or are otherwise adulterated or misbranded. DSHEA and FDA's implementing regulations establish special requirements for dietary supplements that differ in some respects from those covering "conventional" foods.

DSHEA defined the term "dietary supplement" as a product that, among other things, is intended for ingestion, is intended to supplement the diet, is labeled as a dietary supplement, is not represented as a conventional food or as a sole item of a meal or diet,

and contains one or more "dietary ingredients." "Dietary ingredients" are defined as vitamins, minerals, amino acids, herbs or other botanicals, dietary substances (such as enzymes), and concentrates, metabolites, constituents, extracts, or combinations of the preceding types of ingredients. Dietary supplements may be found in many forms, such as tablets, capsules, powder, liquids, or bars.

LABELING OF DIETARY SUPPLEMENTS

Under the FD&C Act and FDA's implementing regulations, the label of a dietary supplement must bear a statement of identity (product name) that identifies the product as a dietary supplement (Title 21 United States Code [U.S.C.] §321 [ff][2][C] and §342 [s][2][B] and Title 21 Code of Federal Regulations [CFR] §101.3 [g]); nutrition information in the form of a Supplement Facts panel (21 U.S.C. [Q][5][F] and 343 [s][2][A] and 21 CFR §101.36 and §101.4 [h]); a list of any ingredients not listed in the Supplement Facts panel (21 U.S.C. §343 [i][2] and 21 CFR §101.4 [g]); the name and address of the manufacturer, packager, or distributor (21 U.S.C. §343 [e][1] and 21 CFR §101.5); and the net quantity of contents (21 U.S.C.§343 [e][2] and 21 CFR §101.105). In addition, if the labeling includes a claim relating to an effect on the structure or function of the body, a claim of general well-being, or a claim of a benefit related to a classical nutrient deficiency disease, the product must bear a disclaimer stating that FDA has not evaluated the claim and that the product is not intended to diagnose, treat, cure, or prevent any disease. Furthermore, a manufacturer of a dietary supplement making such a health claim must have substantiation that the claim is truthful and not misleading and

must notify FDA that its product bears such a claim within 30 days of marketing the product with the claim.

DIETARY SUPPLEMENT SAFETY

Statutory Framework

As with most foods, there is no requirement for manufacturers of most dietary supplements to provide evidence of product safety to FDA prior to marketing. Accordingly, FDA regulates the safety of dietary supplements primarily through a post-market evaluation of whether the product is adulterated under one of the provisions of the FD&C Act. The burden of proving lack of safety rests with the Federal government. There is a 75-day pre-market notification requirement for dietary supplements that contain certain dietary ingredients that were not marketed in the United States before October 15, 1994, or "new dietary ingredients." Specifically, the manufacturer or distributor of a supplement that contains one or more new dietary ingredients must submit a pre-market notification to FDA unless all new dietary ingredients in the product have been present without chemical alteration in the food supplement as articles used for food. In its notification to FDA, the manufacturer or distributor of the supplement must submit information, including citation to published articles, that forms the basis for the firm's conclusion that the dietary supplement containing the new dietary ingredient will reasonably be expected to be safe. Unless there is a history of use or other evidence of safety establishing that the new dietary ingredient will reasonably be expected to be safe

when used as recommended or suggested in the labeling of the dietary supplement, the supplement is deemed adulterated.

ENFORCEMENT ACTIONS

At the core of FDA's DSHEA enforcement efforts is our commitment to work with industry in order to encourage the legitimate manufacture, sale, and use of dietary supplements while enforcing the law aggressively against fraudulent product claims and other illegal practices. Dietary supplement enforcement efforts include inspections that have resulted in voluntary compliance, voluntary recalls, warning letters, seizures and injunctions, criminal enforcement, and joint enforcement actions with the Federal Trade Commission (FTC) and the Department of Justice.

FDA shares Federal oversight of dietary supplements with FTC. FDA regulates the safety, manufacturing, and labeling of dietary supplements, while FTC has primary responsibility for regulating the advertising of these products. Over the last few years, FDA and FTC have worked together to ensure that there is a seamless assertion of our jurisdiction over these products. With the mutual goal of consumer protection, FDA and FTC chair an interagency health fraud steering committee that includes Federal agencies in the U.S., Canada, and Mexico. Also, as part of FDA's effort to curb Internet health fraud, the Agency has conducted several "surfs" to identify fraudulent marketing of health care products over the Internet. These actions were carried out in partnership with FTC and other law enforcement and public health authorities in the U.S. and abroad.

FDA works closely with the Drug Enforcement Administration (DEA) when illegal steroid products are marketed as dietary supplements. The Anabolic Steroid Control Act (ASCA) of 2004 classified androstenedione (an anabolic steroid precursor) and a number of other steroid substances as controlled substances by defining them as anabolic steroids, which fall under Schedule III of the Controlled Substances Act. The new law provided for scheduling of new steroid substances not covered by the ASCA through DEA's administrative scheduling process.

When criminal sanctions may be warranted, FDA's Office of Criminal Investigations (OCI) gets involved. OCI is the entity within the Agency responsible for the conduct and coordination of criminal investigations and, as such, maintains liaison and cooperative investigative efforts with other Federal, state, local, and international law enforcement agencies. OCI is instrumental in implementing FDA criminal investigation policy, training, and coordination. OCI uses all customary and legal criminal investigative techniques, interfaces directly with Federal and local prosecutorial offices, and participates in grand jury proceedings and judicial actions as required.

From October 2002 through February 2006, FDA has conducted 588 domestic inspections of dietary supplement manufacturers, issued more than 350 "warning letters" and "cyber letters" to marketers of dietary supplement products, seized products worth more than $13.4 million, supervised the voluntary destruction of more than $3 million worth of products marketed as dietary supplements that were promoted with unsubstantiated claims or that were unapproved drugs or were unsafe, and obtained

permanent injunctions against five firms distributing misbranded or unapproved drugs as dietary supplements.

FDA enforcement has extended to our nation's borders, where we have refused importation for more than 4,000 foreign shipments of potentially unsafe or misbranded dietary supplements offered for entry in the U.S. The Agency's enforcement actions send a clear message that FDA will not tolerate fraudulent practices that victimize and endanger consumers.

As with all of FDA's activities, priorities are established based upon the direct impact upon public health. Products that present a direct health hazard to consumers are the Agency's highest priority, although FDA also proceeds against products that present indirect health threats. When the Agency encounters such products, FDA will use all available civil and administrative remedies to assure that the product is quickly removed from the market. We also aggressively publicize our actions to warn consumers and health professionals about such products. In some cases, the Agency may initiate a criminal prosecution against manufacturers or distributors of violative products.

FDA recognizes that traditional enforcement actions and coordinated efforts with other agencies are necessary, but these steps are not the only components of a thoughtful enforcement strategy. We fully appreciate that the dietary supplement industry has a vested interest in curbing fraudulent operators and practices, and that most of FDA's regulated industries are interested in complying with the FD&C Act, and do so. For this

reason, FDA will continue to assist the industry by issuing regulations and guidance documents addressing the manufacture, labeling, and sale of dietary supplements and other FDA-regulated products.

SCIENTIFIC RESEARCH

In order to be informed about the safety of dietary supplements, in addition to assessing known reported adverse events, FDA evaluates published literature, evidence-based reports, and the known pharmacology of a compound in order to assist in the evaluation of dietary supplement products. Collaboration with academic centers such as the National Center for Natural Products Research (NCNPR), Federal partners such as the National Institutes of Health and the National Center for Toxicological Research (NCTR), and our consumer and industry stakeholders are important in our efforts to develop a comprehensive safety evaluation of dietary supplement products. For example, the partnership that FDA has with NCNPR at the University of Mississippi is valuable for finding practical solutions to scientific problems encountered with botanical dietary ingredients. For example, in the case of Citrus aurantium extract, FDA needed to ascertain how much synephrine is typically present in imported and domestic Citrus aurantium extracts. To answer this question, scientists at the University of Mississippi obtained citrus plant materials and citrus extracts from a variety of sources and measured the amount of synephrine contained in each sample. A comparison of the amount of synephrine extracted from raw citrus plant materials and the marketed Citrus aurantium extracts revealed that Citrus aurantium extracts typically contain up to 4 percent synephrine. However, Citrus aurantium extracts containing 90 percent synephrine

contain an added amount of chemical synephrine. This allowed FDA to monitor the safety of dietary supplements containing Citrus aurantium and provided a standardized test article for a collaborative project with NCTR to study the effects of Citrus aurantium extract on developmental and reproduction parameters in the rat. For dietary supplements containing botanical ingredients, the development of a toxicologic science base can be especially difficult because of the complex mixture of chemicals contained in botanical extracts. In the case of dietary supplement products containing Citrus aurantium extract, there are a variety of naturally occurring chemicals such as tyramine and octopamine, which can have a pharmacological effect on blood pressure and heart rate. Depending on the harvest time and agricultural growing conditions of the citrus plant, the amount of each chemical extracted can vary from one product to another. It is critical that FDA continue to base its conclusions on evidence-based scientific information. We are continuing to work with our colleagues at NCTR and our partners at NCNPR at the University of Mississippi to develop a strong science base on which to support our regulatory actions.

CFSAN ADVERSE EVENT REPORTING SYSTEM (CAERS)

FDA's Center for Food Safety and Applied Nutrition (CFSAN) Adverse Event Reporting System (CAERS) monitors adverse event reports for CFSAN-regulated products, i.e. food (including dietary supplements) and cosmetics. Adverse event reporting for dietary supplements is not mandatory. CAERS is a computerized system that records reports submitted voluntarily by industry, health care providers, and consumers. Since becoming operational in June 2003, CAERS has received approximately 1,145 adverse

event reports. Using CAERS, CFSAN staff can track, do preliminary evaluations, and monitor adverse event reports and consumer complaints received about CFSAN-regulated products. Individual serious adverse event reports are reviewed by appropriately assigned CFSAN staff within days of receipt. Adverse event reports are reviewed on a regular basis by the program offices responsible for a given product category. FDA also notifies the manufacturer (when the manufacturer is identified) when it receives an adverse event report about a CFSAN-regulated product. Efforts are on-going to incorporate a thesaurus of botanically-derived ingredients used in dietary supplements into the CAERS database to enable more sophisticated search strategies and to create a thesaurus for cosmetic ingredients. Work will be done to ensure compatibility of the system with Federal Health Architecture Initiatives regarding post-marketing surveillance and public health information.

DIETARY SUPPLEMENT GOOD MANUFACTURING PRACTICES

Under DSHEA, another important tool of FDA's regulatory and surveillance activities to help ensure the safety of dietary supplement products is the Agency's authority to promulgate regulations for dietary supplement current good manufacturing practices (cGMPs). Such regulations will help ensure product quality and consistency. This regulation is under review at the Office of Management and Budget. FDA will continue to take action against dietary supplement products that threaten the public health and believe that the new cGMP regulations will provide another level of safety for the American public. Currently, dietary supplement manufacturers are subject to the

requirements specified in Title 21, CFR, part 110, Current Good Manufacturing Practice in Manufacturing, Packing, or Holding Human Food.

CONSUMER HEALTH INFORMATION FOR BETTER NUTRITION INITIATIVE

As part of FDA's efforts on dietary supplements, the Agency has been working to inform consumers about these products and their uses through the Consumer Health Information for Better Nutrition Initiative. The focus of this effort is to make available more scientifically accurate information about foods and dietary supplements so Americans know the health consequences of what they consume. This Better Health initiative is designed to foster two complementary goals concerning the labeling of food and dietary supplements:

- encouraging marketers of conventional foods and dietary supplements to make accurate, science-based claims about the health benefits of their products, and
- bringing enforcement actions against those who make false or misleading claims.

As a part of this initiative, FDA has undertaken numerous enforcement actions against dietary supplement manufacturers and others who make false or misleading claims about the health benefits or other effects of their products. I have included as an addendum to this statement some examples of recent enforcement actions.

Mr. Chairman, thank you for this opportunity to describe FDA's regulatory program for dietary supplements. I would be pleased to answer any questions.

ADDENDUM

Dietary Supplement Actions – June 2004 – March 2006

June 2004

Prison Sentence for Selling Laetrile as a Cure for Cancer

A U.S. District Court judge in the Eastern District of New York sentenced defendant Jason Vale to 63 months in prison and 3 years of supervised release. Vale, through Christian Bros., had sold Laetrile over the Internet as a cure for cancer and saturated the public with a massive Internet and "spam" E-mailing marketing campaign which guaranteed persons a cancer free life if they used his products.

http://www.fda.gov/bbs/topics/news/2004/NEW01080.html

July 2004

Metabolife Indicted for Making False Representations to FDA

A Grand Jury in the Southern District of California returned an indictment against Metabolife International, Inc., and its founder, Michael J. Ellis. The indictment charges both defendants with making false, fictitious, and fraudulent representations to FDA and two counts of corruptly endeavoring to influence, obstruct, and impede proceedings concerning the regulation of dietary supplements containing ephedra being conducted by FDA. Until FDA banned the use of ephedrine alkaloids in dietary supplements, Metabolife was one of the largest retailers of dietary supplements in the United States,

based largely on sales of its ephedra-based product. Metabolife and Ellis are charged with falsely representing a number of different material facts to FDA in letters to the Agency, including statements indicating that the firm had not received any adverse health reports about its product.

www.fda.gov/bbs/topics/news/2004/doj72204.html

U.S. District Judge Issues Permanent Injunction Against Lane Labs-USA, Inc.

A judge in the United States District Court for the District of New Jersey, found that three products sold by Lane Labs-USA, Inc. and its president Andrew J. Lane (the defendants) as dietary supplements and a cosmetic - Benefin, MGN-3 and SkinAnswer – are unapproved new drugs under Federal law because they were being marketed as treatments for cancer, HIV, and skin cancer without FDA approval. In addition, the judge permanently enjoined the defendants from distributing the products unless the products are first either approved for marketing by FDA or distributed pursuant to an investigational new drug (IND) application for purposes of conducting a clinical trial. The judge also ordered the defendants to pay restitution to all purchasers of the products since September 22, 1999. Lane Labs appealed the decision to allow restitution. In October 2005, the U.S. Court of Appeals for the Third Circuit ruled in FDA's favor, affirming the District Court's decision regarding restitution.

http://www.fda.gov/bbs/topics/news/2004/NEW01086.html

August 2004

Firms Voluntarily Destroy Over $287,000 Inventory of Ephedra

In August 2004, two companies voluntarily destroyed dietary supplements containing ephedrine alkaloids. IDS Sports, Oveida, Florida, voluntarily destroyed approximately $230,315.16 worth of dietary supplement products. Europa Sports Products, Inc., Mesquite, Texas, voluntary destroyed 19 pallets containing 1,341 cases of a liquid products containing ephedra (ephedrine alkaloids), worth $28,988.00, and 1,142 cases of sport drinks containing ephedrine alkaloids worth approximately $28,000.

Warning Letter to Manufacturer of Cortislim

FDA and the Federal Trade Commission cooperated in an action to address claims made by Window Rock Enterprises in its labeling and promotion of the product Cortislim, a product promoted heavily through infomercials for weight loss. In August 2004, FDA issued a Warning Letter to Window Rock Enterprises. The Warning Letter stated that Cortislim is misbranded because the product's labeling includes unsubstantiated claims relating to weight loss. In September 2004, FTC filed a Stipulated Interim Agreement and Order against Window Rock and several of the firm's management. In the agreement, the firm agreed to cease all promotion of products for serious diseases or weight loss if such representations were not supported by competent and reliable scientific evidence that substantiated the claims.

http://www.ftc.gov/opa/2004/10/windowrock.htm

October 2004

Warning Letters issued for Unsubstantiated Weight Loss Claims

FDA issued Warning Letters to nine firms that were marketing dietary supplement products with claims regarding weight loss. Many of the claims were related to the products' purported ability to block the absorption of fats or carbohydrates. FDA found that the products were misbranded because the claims were not supported by competent and reliable scientific evidence.

http://www.cfsan.fda.gov/~dms/wl-list2.html

November 2004

Seizure of Products that Contain Ephedrine Alkaloids

The U.S. Marshals Service, in a case initiated by FDA, seized more than 2.1 million capsules of Vitera-XT in the possession of Asia MedLabs, Houston Texas. Although the product was labeled as a "traditional Asian herbal formulation," the product is still considered a dietary supplement because its label included a "Supplement Facts" panel and the dietary supplement disclaimer. FDA initiated the seizure because the product contains ephedrine alkaloids. The firm's Internet website also made claims that the product treats diseases or conditions.

http://www.fda.gov/bbs/topics/news/2004/NEW01140.html

December 2004

Seizure of ginseng found to contain illegal pesticides

The U.S. Marshals, in a case initiated by FDA, seized ginseng products from FCC Products, Inc., Livingston, New Jersey. FDA initiated the action because the ginseng products are considered adulterated under the Federal Food, Drug, and Cosmetic Act because they contain unsafe chemical residues from the pesticides procymidone and quintozene. These residues are deemed unsafe because there has been no maximum amount of residues allowed (tolerance) established for them in ginseng. FDA is responsible for enforcing pesticide tolerances and food additive regulations.

http://www.fda.gov/fdac/departs/2005/205_upd.html#ginseng

November 2005

FDA and FTC Joint Action Against Marketers of Unapproved Alternatives to Hormone Therapies

In November 2005, FDA and the Federal Trade Commission joined to take action against a number of products that are promoted for use as alternatives to hormone therapies and that claim to prevent, treat, cure, or mitigate serious diseases. FDA issued "Warning Letters" to 16 dietary supplement or hormone cream manufacturers who claim their products are effective in preventing or treating diseases and conditions such as cancer, heart disease, and osteoporosis. The alternative therapies are often promoted as "natural" or "safer" treatments that can be used in place of approved hormone therapies. FTC issued letters to 34 websites, stating that FTC is unaware of any competent and

reliable scientific evidence to support the claims.

www.fda.gov/bbs/topics/NEWS/2005/NEW01260.html

December 2005

Seizure of Dietary Supplements Containing Ephedrine Alkaloids

In December 2005, the U.S. Marshals, at the request of FDA, seized Nature's Treat Energy Plus #1, a dietary supplement found to contain ephedrine alkaloids. The product was seized in both Gainesville, Texas, at Nature's Treat, Inc., and in Eugene, Oregon, at ACD Distributing, LLC. Marshals seized 2634 bottles from the Texas location and 363 bottles from the Oregon location. The seized products had a total retail value of approximately $150,000.

www.fda.gov/bbs/topics/NEWS/2005/NEW01267.html

Actions to Address Fraudulent Avian Flu Therapies

In December 2005, FDA issued "Warning Letters" to nine companies marketing bogus products with claims that the products would prevent, cure, or treat avian flu or other forms of influenza. FDA is not aware of any scientific evidence that the products would be safe or effective for treating or preventing avian flu. Eight of the letters were issued to firms marketing dietary supplements, and the other letter was issued to a firm marketing a drug product. Examples of the claims cited include, "prevents avian flu," "a natural virus shield," and "kills the virus."

www.fda.gov/bbs/topics/NEWS/2005/NEW01274.html

January 2006

Seizure of Dietary Supplements Containing Ephedrine Alkaloids

In January 2006, the U.S. Marshals, at the request of FDA, seized dietary supplements that contain ephedrine alkaloids from ATF Fitness Products, Oakmont, Pennsylvania. The seized products include five boxes of dietary supplements, worth approximately $16,000.

www.fda.gov/bbs/topics/NEWS/2006/NEW01297.html

February 2006

Seizure of Dietary Supplement with Ephedrine Alkaloids

In February 2006, the U.S. Marshals, at the request of FDA, seized approximately $3 million worth of dietary supplements and raw materials that were labeled to contain ephedrine alkaloids at Hi-Tech Pharmaceuticals, Norcross, Georgia. The seizure included more than 200 cases of finished products, more than 200 boxes of bulk tablets, and nine of ephedrine alkaloid raw materials.

www.fda.gov/bbs/topics/NEWS/2006/NEW01325.html

Chairman TOM DAVIS. Thank you very much.
Dr. Coates.

STATEMENT OF PAUL M. COATES

Dr. COATES. Good morning, Mr. Chairman. I am Paul Coates, Director of the Office of Dietary Supplements at the National Institutes of Health. I appreciate the opportunity to appear before you today to talk about NIH efforts and research on dietary supplements.

As you pointed out, dietary supplements are widely used by American consumers for their potential health benefits, often in combination with other lifestyle measures. The potential of some supplement ingredients to improve health and to prevent disease have been realized when they have been subjected to modern scientific testing. Others have yet to undergo rigorous evaluation in order to establish their efficacy and safety. Some of these are under active investigation at the NIH, as I will mention in a moment. Some ingredients in dietary supplements have the potential for harm.

I would like to give you a few examples of recent and ongoing NIH-funded research efforts evaluating dietary supplement ingredients. The Gate trial reported last month that the combination of glucosamine and chondroitin sulfate appears not to have an effect on osteoarthritis pain overall in the population, but may provide relief to patients in the category with moderate to severe knee pain due to osteoarthritis. The ongoing Select trial evaluates the potential role of Vitamin E in prostate cancer prevention.

ODS, my office, has sponsored a series of evidence reports on the health affects of Omega 3 fatty acids for a number of conditions. Of the reports concluded that there was substantial evidence for a benefit of Omega 3s in the secondary prevention of heart disease, but that there was considerably less evidence for an affect on primary prevention, that is in the general population. ODS and its NIH partners will use these reports to assist in defining priorities for future research investigation on these agents.

I would comment at this point that research efforts need to continue at a pace in which NIH remains committed to encouraging and supporting the best science in this area. You might be interested to know that between the 1999 and 2004, NIH as a whole invested more than $1 billion in support of research related to dietary supplements.

Turning now specifically to the Office of Dietary Supplements at NIH, it was authorized by DSHEA in 1994 and came into being in 1995. The ODS mission is to identify and foster research on the health benefits and risks of supplements and to translate that research into useful information for consumers. As a result of increases in funding for the office, ODS has been able to expand its role in a number of important activities. Examples include the fact that last year we were able to co-fund over 100 research grants on dietary supplements with other institutes and centers. This includes the NIH program of botanical research centers jointly funded by ODS, the National Center for Complementary and Alternative Medicine, and the National Institute of Environmental Health Sciences. There are six such botanical research centers

around the country that specialize in interdisciplinary research on botanical supplements.

We regularly partner with other organizations both within and outside the NIH to meet our research needs. An example of two of these include the fact that there is an upcoming NIH State-of-the-Science Conference on the role of multivitamins and minerals in chronic disease prevention to be held on the NIH campus in May, sponsored by ODS and many other institutes and Federal agencies. In addition, ODS coordinates a program to develop, validate, and disseminate analytical methods and reference materials for supplements in collaboration with the FDA, the National Institute of Standards and Technology, and a number of private sector organizations. This resource will be valuable for researchers, regulators, industry, and ultimately the public by providing improved tools for the characterization of supplements.

A key feature of all of the examples I have given here is that they are collaborations that ODS has built with other NIH agencies, with other Federal agencies, such as FDA, and with partners in the academic and private sectors. To discover the full potential of supplements in public health, more must be learned about their efficacy and safety through basic and clinical research.

Finally, I want to emphasize the major goal of ODS, and that is the translation of scientific findings into meaningful information for consumers. To that end, we publish a number of consumer-oriented documents, most available on our Web site, that include, for example, fact sheets on a variety of supplements. Details of these and other public information resources from our office are provided in my written testimony.

Mr. Chairman, thank you again for the opportunity to review the work of the Office of Dietary Supplements at NIH and I would be very happy to answer your questions.

[The prepared statement of Mr. Coates follows:]

Testimony
Before the Committee on Government Reform
United States House of Representatives

The Mission and Work of the Office of Dietary Supplements at the National Institutes of Health

Statement of
Paul M. Coates, Ph. D.
Director
Office of Dietary Supplements
National Institutes of Health
U.S. Department of Health and Human Services

For Release on Delivery
Expected at 10:00 a.m.
on Thursday, March 9, 2006

Mr. Chairman and Members,

Thank you for the opportunity to appear before you today at this hearing "The Regulation of Dietary Supplements: A Review of Consumer Safeguards", representing the Office of Dietary Supplements (ODS) at the National Institutes of Health (NIH). I became Director of ODS in late 1999, and I have had the pleasure of appearing before the Committee twice before, in July 2002 and September 2004. At those visits, I provided you with some details about ongoing activities of ODS and other NIH Institutes and Centers (ICs) and I highlighted both the opportunities and the challenges that NIH faces as it develops a solid scientific base in the field of dietary supplements.

You have asked me today to address the work and mission of ODS, how we partner with other agencies and organizations, including the Food and Drug Administration (FDA), to meet common goals, and how we work to educate the public regarding dietary supplements. These are all very important matters, ones that occupy me and my staff every day. I will also use this opportunity to tell you about the broader NIH involvement in dietary supplement research. While ODS portrays itself as a catalyst in stimulating trans-NIH research activities in this area, the NIH ICs, as you will see, have had a longstanding commitment to research in this field.

Dietary supplements are widely used by American consumers, often in combination with other lifestyle measures such as diet and physical activity, for their potential benefits in health promotion and disease prevention. At a hearing of this Committee in 2004, I

commented that population surveys, such as the National Health and Nutrition Examination Survey (NHANES), which is conducted by the Centers for Disease Control and Prevention (CDC) and funded in part by NIH organizations including ODS, show that 50% or more of American adults use supplements on a regular basis, primarily vitamins and minerals, but herbal and other supplements as well[1].

There are many hopes pinned on dietary supplements for improving health and reducing the risk of chronic disease, hopes realized when in some cases by modern scientific testing. Examples of these include:

- Folic acid to reduce the risk of neural tube defects, one of the most common birth defects;
- Iron supplementation during pregnancy to reduce the risk of maternal anemia;
- Vitamin B-12 supplementation for those (particularly among persons over 50) who cannot readily absorb food-bound vitamin B-12;
- Vitamin and antioxidant supplementation to reduce the rate of progression of macular degeneration; and
- Use of vitamin D supplements by older adults and people exposed to insufficient sunlight to ensure adequate vitamin D status for optimal calcium absorption and reduced risk of bone loss.

With NIH support for dietary supplement research, much already has been accomplished. For example, preliminary results of a National Center for Complementary and Alternative

[1] Radimer K, Bindewald B, Hughes J, Irvin B, Swanson C, Picciano MF: Dietary supplement use by US

Medicine (NCCAM)- and National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS)-funded trial recently were published in the *New England Journal of Medicine* that suggest that the popular dietary supplements, glucosamine and chondroitin sulfate, may provide pain relief to patients with moderate-to-severe pain from knee osteoarthritis. Also, ODS, NCCAM, and the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) are partnering to learn more about the potential of milk thistle to address chronic liver disease. In addition, there are ongoing clinical trials of dietary supplement ingredients funded by several components of the NIH. Examples include the National Cancer Institute (NCI)-funded SELECT trial to investigate the role of vitamin E and selenium in preventing prostate cancer, and a trial funded by several NIH Institutes and Centers (ICs) (NCCAM, ODS, and the National Institute on Aging – NIA) to explore whether the dietary supplement Ginkgo biloba can prevent or forestall the neurodegenerative changes associated with Alzheimer's disease.

On the other hand, ingredients used in some dietary supplements on the market in the United States have not undergone the rigorous scientific testing needed to establish their efficacy and safety; some of these have been evaluated by NIH ICs or are under active early investigation. Other ingredients contained in some dietary supplements have been shown to be potentially harmful to some individuals; for example, research has shown that beta-carotene, instead of reducing lung cancer risk, may actually increase it among cigarette smokers. For still others, there are signals of concern (e.g., such as herb-drug

---

adults: Data from the National health and Nutrition Examination Survey, 1999-2000. Amer J Epidemiol 160:339-349, 2004.

interactions and adverse event reports, such as those shown for ephedra-containing dietary supplements) that need to be addressed in a scientifically sound manner.

The Work and Mission of the Office of Dietary Supplements

ODS was mandated by the Dietary Supplement Health and Education Act of 1994 (DSHEA). It was formally installed in the Office of the Director of NIH in 1995, and so we have just celebrated our tenth anniversary. Its mission is to "strengthen knowledge and understanding of dietary supplements by evaluating scientific information, stimulating and supporting research, disseminating research results, and educating the public to foster an enhanced quality of life and health for the U.S. population".

ODS has in place its second 5-year Strategic Plan which was developed with input from a wide range of stakeholders. This Plan has been published and can be found on the ODS website (http://ods.od.nih.gov). The Strategic Planning process helped us considerably in assessing how far we had come since the first plan was published in 1998 and in guiding ODS activities for the future. ODS has been able to embark on a number of important activities, including:

- Co-funding of dietary supplement research grants with other Institutes and Centers (ICs) at NIH. In FY 2005, ODS invested approximately $15 million in co-funding 100 grants with 15 NIH ICs.
- Sponsoring conferences and workshops, again most often in collaboration with other ICs; since the inception of this program, ODS has sponsored more than 100

such events. These are open to the public and summaries are available on the ODS Web site.

- Developing a series of fact sheets on dietary supplements, in collaboration with NCCAM and the NIH Clinical Center.
- Initiating two important publicly accessible Web-based databases: the *International Bibliographic Information on Dietary Supplements (IBIDS)* developed jointly with the National Agricultural Library of the U.S. Department of Agriculture (USDA), which cites roughly 750,000 references to the world's literature, and *Computer Access to Research on Dietary Supplements (CARDS)* to track the Federal investment in dietary supplement research. The current CARDS data set describes the NIH investment from FY 1999 to FY 2004; over that period of time, NIH alone has invested over $1 billion in supporting more than 3500 research projects related to dietary supplements.
- An especially important activity of ODS, in collaboration with NCCAM and the National Institute of Environmental Health Sciences (NIEHS), is its program of comprehensive Dietary Supplement Research Centers located in academic settings around the country. There are six of these multidisciplinary Centers (located at Purdue University/University of Alabama at Birmingham; Iowa State University/University of Iowa; University of Illinois at Chicago; Pennington Biomedical Research Center; Memorial Sloan Kettering Cancer Center; and Wake Forest University) whose primary focus is interdisciplinary research on botanical dietary supplements.

The budget for ODS has grown, from $3.5 million in FY 1999 to approximately $27 million in FY 2006. This has permitted expansion of our research, education, and communications agenda into new and important areas:

- Evidence-based reviews of dietary supplement efficacy and safety, in collaboration with other NIH ICs and the Agency for Healthcare Research and Quality (AHRQ). I will return to this activity later in my testimony.
- Nationally representative surveys of dietary supplement use over time, e.g., the NHANES conducted by the Centers for Disease Control and Prevention (CDC). ODS contributes to this effort in several ways and is developing an accurate, easy-to-use, Web-based analysis tool to determine nutrient intakes from foods and supplements by various population groups.
- Development of a database of dietary supplement ingredients in collaboration with the U.S. Department of Agriculture (USDA); this is essential information for evaluating intakes from dietary supplements for the U.S. population and for monitoring intakes over time; it will provide much-needed information for the research community in designing and monitoring studies; when completed, it will also be useful for the industry and for consumers to have ready availability to information on the composition of a broad range of marketed dietary supplement products.
- Development, validation, and dissemination of analytical methods and reference materials for dietary supplements, in collaboration with FDA and a number of private sector organizations[2], including the Association of Official Analytical

[2] Saldanha LG, Betz JM, Coates PM: Development of the analytical methods and reference materials program for dietary supplements at the National Institutes of Health. J AOAC Int. 87:162-165, 2004.

Chemists (AOAC) International. This will be especially useful for researchers and industry users. AOAC International has also developed training activities for the industry and research communities as part of this program.

- Expansion of our information and communications program following a comprehensive evaluation and assessment.

In partnership with other NIH ICs, ODS funds research grants in areas such as (primary IC in parentheses):

- Alpha-tocopherol modulation of xenobiotic metabolism (NIDDK);
- Black cohosh and menopause-related anxiety (NCCAM);
- Phytoestrogens and aging: dose, timing, and tissue (NIA);
- Vitamin D and progression of knee osteoarthritis (NIAMS);
- Aging, vitamin E, and immune function (NIA);
- Chromium enhancement of insulin signaling (NCCAM);
- Mechanisms of alcohol-induced immunosuppression (National Institute on Alcohol Abuse and Alcoholism – NIAAA);
- Folate-genome interactions in colorectal cancer (NCI);
- Neuromodulatory effects of ginkgolides and bilobalides (National Institute of Mental Health);
- Modulation of autoimmunity by green tea polyphenols (NCCAM):
- Cranberry effects on Candida albicans adherence (NCCAM);
- Mechanisms of prostate cancer prevention by lycopene (NCI).

ODS sponsors workshops and conferences, again in collaboration with other organizations both within and outside NIH. These public meetings are valuable sources of information in assisting us to shape upcoming research activities. The outcomes of these conferences are summarized and available on the ODS Web site and are also often published in scientific journals. Some recent and upcoming conferences include:

- Diet, DNA Methylation Processes and Health, sponsored by NCI with participation by ODS, NIEHS, NIDDK, the National Heart, Lung, and Blood Institute (NHLBI), the National Institute of Child Health and Human Development (NICHD), and the FDA. This led to the funding of 10 grants by NCI and ODS.
- Three conferences on Dietary Supplement Use in Children, in Women, and in the Elderly (with NICHD, NCCAM, NIA, the NIH Office of Research on Women's Health, and others).
- Biomarkers for Diet/Cancer Relationships, jointly sponsored by FDA, NCI, and ODS.
- Animal Diets for Use in Studying Phytoestrogen Effects, jointly sponsored by NIEHS and ODS.
- Vitamin D and Health in the 21st Century, jointly sponsored by ODS and NICHD.
- An NIH State-of-the-Science Conference on the Role of Multivitamins/ multiminerals in Chronic Disease Prevention, to be held in May 2006 and organized by the NIH Office of Medical Applications of Research with sponsorship from ODS and many other NIH ICs.

ODS Collaboration with Other Agencies and Organizations

The development of new areas of investigation relies on forging strategic partnerships with other agencies as well. A few current examples include Interagency Agreements with:

- The National Center for Health Statistics (NCHS) at CDC, to support improvements in the ability of NHANES to more accurately assess dietary supplement intake in the U.S., as well as biomarkers of supplement usage related to health outcomes.
- AHRQ, to develop evidence reports of dietary supplement efficacy and safety. The first of these, on ephedra efficacy and safety in weight management and athletic performance enhancement, was published in early 2003[3]. Other reports have been completed (a series on the health effects of omega-3 fatty acids) or are underway on topics that include "Vitamin D Adequacy and Health" and "Relationship between Antioxidants in Berries and B Vitamins and Age-related Neurodegenerative Disorders". A complete list of these is available on the ODS Web site at the URL given at the end of this testimony. In all of these cases, the goal of the reports is to give ODS and its NIH partners an objective and independent view of the current state of the science as we make decisions about further research priorities.

---

[3] Shekelle PG, Hardy ML, Morton SC et al: Efficacy and safety of ephedra and ephedrine for weight loss and athletic performance: a meta-analysis. JAMA 289:1537-1545, 2003.

- FDA, to support the development and validation of analytical methods by AOAC International.
- FDA and the National Institute of Standards and Technology (NIST) in the Department of Commerce, to support development of standard reference materials.
- Numerous agencies of the USDA, the Department of Health and Human Services (DHHS), and the Department of Defense (DoD) to identify and enhance research in support of the development of Dietary Reference Intakes.
- NIEHS and the Food and Agriculture Organization/World Health Organization (FAO/WHO) to support development of an international conceptual model for nutrient risk assessment.

Broader NIH collaborations with other agencies in pursuit of these goals are also important. Let me provide two examples:

- Several components of NIH (including ODS, NCCAM, NIAMS, and the National Institute on Drug Abuse – NIDA) joined FDA and the Drug Enforcement Administration (DEA) to fund the development of an animal model to evaluate the anabolic potential of steroids and steroid precursors, some of which are purported to be in dietary supplements.
- The National Toxicology Program (NTP), housed in NIEHS, is a joint activity with FDA's National Center for Toxicological Research (NCTR). The NTP is currently evaluating *Citrus aurantium*, an herb which has become popular in weight-loss products as a replacement for *Ephedra*, in standard animal toxicity and physiological models.

ODS has worked with partners outside of the government in a number of areas:

- Publication of an annual bibliography of outstanding research in dietary supplements, initially with the Consumer Healthcare Products Association. This effort, now fully under the auspices of ODS, is in its sixth year.
- Publication of "Botanical Pharmacognosy and the Microscopic Characterization of Botanical Raw Materials" by the American Herbal Products Association, supported in part by ODS.
- Publication of a summary (one for health professionals, one for dietary supplement industry readers) of the conference "Dietary Supplement Use in the Elderly" in collaboration with the Foundation for the National Institutes of Health and Virgo Publishing Inc.
- Publication of "What Supplements Are You Taking? Does Your Health Care Provider Know? It Matters and Here's Why", a brochure for the elderly, jointly produced by FDA and ODS in collaboration with a number of private sector organizations.
- Collaboration with the National Consumers League on the topic of dietary supplements and anticoagulant therapies.
- Regular participation of ODS staff in educational and scientific sessions at academic meetings, consumer conferences, industry meetings, and expositions.
- Engaging with federal agencies such as the FDA, industry, non-governmental organizations and academia to develop, validate, and disseminate analytical methods and reference materials for dietary supplements.

I would like to stress a theme that runs through all of the activities that I have mentioned here. All were developed as the result of collaborations with other organizations at NIH, in other agencies of DHHS, and in other government departments. They could not have been accomplished otherwise. These collaborations enriched our program in many ways, including the sharing of scientific expertise, leveraging of limited resources, and the ability to reach a broader and more diverse group of stakeholders and audiences. In my view, this is crucial to the advancement of science and dissemination of information in the area of dietary supplements. From these collaborations, we know that there is a critical need for additional research on dietary supplements, particularly botanical products. To discover the full potential of dietary supplements for the public health, more must be learned about their safety and efficacy through basic and clinical research, product standardization, and improved research design. Further details of these and other interactions can be found on the ODS Web site (http://ods.od.nih.gov).

Public Education Efforts

At the end of the day, a major goal of our work is to improve the information available to consumers as they make healthcare choices. ODS employs a number of strategies to make information available to the public. Some of them have already been mentioned. Many of these resources are available on the ODS Web site and are listed below.

- Complete List of Dietary Supplement Fact Sheets and Related Information

http://ods.od.nih.gov/Health_Information/Information_About_Individual_Dietary_Supplements.aspx

- Dietary Supplements: Background Information (fact sheet)
  http://ods.od.nih.gov/factsheets/dietarysupplements.asp
- What Supplements Are You Taking?
  http://ods.od.nih.gov/pubs/partnersbrochure.asp
- Annual Bibliographies of Significant Advances in Dietary Supplements
  http://ods.od.nih.gov/Research/Annual_Bibliographies.aspx
- CARDS (Computer Access to Research on Dietary Supplements Database)
  http://ods.od.nih.gov/Research/CARDS_Database.aspx
- IBIDS (International Bibliographic Information on Dietary Supplements Database)
  http://ods.od.nih.gov/Health_Information/IBIDS.aspx
- Complete List of ODS-Sponsored Evidence Reports on Dietary Supplement Efficacy and Safety
  http://ods.od.nih.gov/Research/Evidence-Based_Review_Program.aspx#reportsinprogress

Summing Up

Mr. Chairman and Members of the Committee, I thank you again for inviting me to talk with you about the role that the Office of Dietary Supplements at NIH plays and to

highlight some of its ongoing research and education efforts. I would be happy to answer your questions.

Mr. DENT [presiding]. The chair thanks the gentleman.

Mr. Peeler, you are recognized.

STATEMENT OF C. LEE PEELER

Mr. PEELER. Good morning, Mr. Chairman and members of the committee. The Commission appreciates the opportunity to testify before you today on this important and timely subject.

The Federal Trade Commission shares responsibility with the Food and Drug Administration for the prevention of false, deceptive, or unsubstantiated claims by dietary supplement manufacturers and retailers. Specifically, the Commission authority to take action against false, deceptive, or unsubstantiated advertising claims for dietary supplements. If the Commission determines that there is reason to believe that a violation has occurred, it can file either an administrative law enforcement action or apply to a Federal District Court to obtain an order enjoining misleading advertising. In appropriate cases, we can also seek an order requiring the payment of consumer redress or disgorgement of profits made from the deceptive advertising.

As described in our testimony, the dietary supplement industry has been an active area of FTC law enforcement. In the past year alone, the Commission has filed 14 complaints against companies making unsubstantiated or false advertising claims for dietary supplements or other natural health care products. During the same period of time, the Commission obtained orders against 40 companies and 44 individuals. In addition to broad injunctive relief, these orders require defendants to pay a total of $35.7 million in consumer redress, disgorgement and civil penalties.

Our most recent settlement is being announced today. That case involves Garden of Life, Inc. and challenges unsubstantiated claims that their dietary supplement treated or cured a variety of ailments ranging from colds to cancer and requiring a payment of $225,000 in consumer redress.

In selecting cases, the Commission considers a number of factors, including the safety of risk and the scope of consumer injury. One priority area has been dietary supplements marketed to or for young people, particularly products that present safety concerns. Past cases have included body building supplements containing steroid precursors, cold remedies containing herbs toxic to the liver, and products containing ephedra that were marketed to young audiences as a natural high.

Of particular relevance to this hearing are FTC cases challenging the marketing of body building products containing andrens, steroid precursors. These cases brought before the substances were banned in 2004 challenged claims that the products could be used, and I quote, safely and with minimal or no negative side effects. The orders in these cases required a strong specific health warning to be included in all future advertising for those products.

Notwithstanding these enforcement efforts and those of the Food and Drug Administration, as the subject of today's hearing illustrates, the marketing of dietary supplements remains a concern. To further address the concerns raised by this committee, the FTC staff is currently reviewing Web sites and chat rooms popular with young athletes to determine if they are making deceptive advertis-

ing claims. In addition to law enforcement, it is important to educate consumers about the potential risks involved in the use of dietary supplement by children.

We welcome the opportunity to work with other authorities, responsible industry members, and others to educate parents and young athletes about the risk associated with these products. The Commission has issued a special consumer education brochure on this subject. As described in that brochure, the Commission and members of the medical community urge the parents to exercise caution in having their children use any dietary supplement. Among the items of good advice in that brochure are reminders that many dietary supplements, and especially herbal products, have never been tested to determine their safety or effectiveness for use by children. Second, the supplements and other natural products are not necessarily safe and can have powerful drug-like effects. For these reasons, parents should check with a health care provider before children start using any dietary supplements. This advice has proved popular. The brochure has been on our Web site for 5 years and is accessed approximately 10,000 times per year.

Again, the subject of today's hearing is important and timely. We appreciate the opportunity to testify and look forward to your questions.

[The prepared statement of Mr. Peeler follows:]

"THE REGULATION OF DIETARY SUPPLEMENTS: A REVIEW OF CONSUMER SAFEGUARDS"

Prepared Statement of the Federal Trade Commission

C. Lee Peeler
Deputy Director, Bureau of Consumer Protection

Before the

Committee on Government Reform
United States House of Representatives

Washington, D.C.

March 9, 2006

Mr. Chairman and members of the Committee, I am C. Lee Peeler, Deputy Director of the Bureau of Consumer Protection, Federal Trade Commission ("FTC" or "Commission"). The Commission is pleased to have this opportunity to provide information concerning its efforts to protect consumers from false or misleading marketing of dietary supplements, especially where it involves the safety of young consumers.[1] The mission of the Federal Trade Commission is to prevent unfair competition and to protect consumers from unfair or deceptive practices in the marketplace. As part of this mission, the Commission has a longstanding and active program to combat fraudulent and deceptive advertising claims about the health benefits and safety of dietary supplements.[2] The agency coordinates those efforts closely with the Food and Drug Administration ("FDA") and frequently calls on the expertise of other government authorities, including the Office of Dietary Supplements of the National Institutes of Health. The Commission is committed to vigorous law enforcement against those who deceptively market dietary supplements. The FTC has filed fourteen actions in the past year and more than 100 actions over the past decade challenging allegedly false or unsubstantiated efficacy or safety claims for dietary supplements.

The dietary supplement industry represents a substantial and growing segment of the

---

[1] The written statement presents the views of the Federal Trade Commission. Oral testimony and responses to questions reflect my views and do not necessarily reflect the views of the Commission or any Commissioner.

[2] The Commission's authority in this area derives from Section 5 of the Federal Trade Commission Act, which prohibits "unfair or deceptive acts and practices in or affecting commerce," and Section 12, which prohibits the false advertisement of "food, drugs, devices, services or cosmetics." 15 U.S.C. §§ 45, 52.

consumer healthcare market with an estimated $20.3 billion in industry sales in 2005.[3] A recent survey of complementary and alternative medicine use in the United States shows that more than one-third of U.S. adults age 18 and over are turning to alternative medicine, including herbal products, enzymes and other dietary supplements.[4] The market for children's supplements has also been growing. Industry analysts estimate annual sales of children's supplements had reached $510 million as of July 2002 and represented one of the top niche markets in the supplement industry.[5]

The supplement category encompasses a broad range of products, from vitamins and minerals to herbals and hormones. Products are promoted to adults not just to maintain basic health and nutrition, but also for weight loss, to build muscle, cure sexual dysfunction, treat and prevent colds and flu, and even reverse arthritis, cure cancer, and treat many other serious diseases. Products promoted specifically for children also extend beyond traditional multivitamins to include treatment and cures for a variety of childhood ailments ranging from colds to more serious conditions such as attention deficit/hyperactivity disorder (AD/HD). Products in the dietary supplement category have also been marketed to appeal to children or adolescents who are seeking to lose weight, build muscle, or even get high.

---

[3] *Nutrition Business Journal,* Supplement Business Report 2005.

[4] Barnes, P. et al., *CDC Advance Data Report #343 Complementary and Alternative Medicine Use Among Adults: United States, 2002* (May 27, 2004), *available at* http://nccam.nih.gov/news/camsurvey_fs1.htm. According to the study, 36% of adults surveyed used some form of complementary and alternative medicine, and 19% of respondents reported using natural products such as herbs, other botanicals and enzymes, most without consulting a healthcare practitioner.

[5] *Nutrition Business Journal* (July 2002).

FTC's Dietary Supplement Advertising Program

Commission law requires that claims about the safety and efficacy of any health-related product, including dietary supplements, be substantiated before the claims are made. The Commission seeks to ensure that consumers get accurate information so that they can make informed decisions about how to manage their own healthcare. Although many supplements offer the potential for real health benefits to consumers, unproven products and inaccurate information can pose a threat to the health and well-being of consumers and cause economic injury. The Commission takes vigorous enforcement action against false and misleading supplement promotions to help ensure that consumers are getting reliable and accurate information in the marketplace. The agency also works to protect consumers by educating them about the safe and appropriate use of supplements through brochures, web sites, feature articles, and other means, and by issuing consumer alerts on specific health and safety topics. The Commission's testimony today will highlight some of those enforcement and education efforts and describe how it coordinates those efforts with the FDA.

Coordination with FDA and other Government Offices

The FTC and FDA have concurrent jurisdiction over dietary supplements and other health and nutrition products and work closely to police the marketplace for deceptive and unsubstantiated claims and for marketing that presents safety concerns. Under a longstanding liaison agreement,[6] the FTC has primary jurisdiction over the advertising of foods, including

[6] *See* Working Agreement Between FTC and FDA, 3 Trade Reg. Rep. (CCH) ¶ 9,859.01

dietary supplements, while the FDA has primary responsibility over the labeling of those products. The staff of the two agencies have always coordinated closely on enforcement matters. Coordination enhances the ability of the two agencies to identify the worst offenders, to share information about the marketers and their products, and to formulate a more effective plan to stop fraud and deception, using the strongest tools available to each agency. [7]

The FTC staff coordinates with many other federal, state, and local government agencies in all of its consumer protection programs. In the dietary supplement program, the Office of Dietary Supplements of the National Institutes of Health has also been an important resource for the FTC. The FTC staff has sought help from that office to identify qualified and knowledgeable scientific experts for law enforcement matters and has used its online resources for background scientific information on various dietary supplement ingredients.

FTC Enforcement Priorities

The Federal Trade Commission commits significant resources to combating false, misleading, or unsubstantiated claims in advertising for healthcare products, including dietary supplements. The Commission has focused its enforcement priorities on national advertising

---

(1971).

[7]One recent example of a successful coordinated enforcement action was the *Seasilver USA* matter, involving a supplement purported to treat or cure cancer, AIDS, diabetes, and 650 other diseases. *FTC v. Seasilver USA, Inc.,* Civil Action No. CV-S-0676-RHL-LRL (D. Nev. Mar. 4, 2004) (final stipulated orders). In that case, the FTC took quick action in federal court to obtain a restraining order, receivership, and asset freeze against the defendants, while the FDA concurrently conducted a seizure of products. The subsequent FTC settlement in *Seasilver* included $4.5 million in consumer redress, while the FDA settlement required the destruction of $5.3 million worth of misbranded product.

claims for products with unproven benefits; products promoted to treat or cure serious diseases; products that may present significant safety concerns to consumers; and products that are deceptively marketed to or for children and adolescents.

Strong Remedies

As in all of its advertising programs, the Commission works to make sure its enforcement actions have a strong impact by holding accountable not just the supplement manufacturer but other parties that play a role in deceptive marketing, such as expert endorsers, ad agencies, infomercial producers, distributors, and catalog companies.[8] The Commission has sought to obtain meaningful relief for consumers, going beyond the basic cease and desist orders in many cases to require substantial monetary relief for consumer redress or disgorgement of profits.[9] In cases of outright fraud or repeated law violations, the agency has obtained explicit bans to prevent individuals from any future marketing of certain categories of products or has required

---

[8] *See, e.g., FTC v. Braswell,* Civil Action No. CV-3700(PJWx) (C.D. Cal. Jan. 19 and 23, 2006) (stipulated final order naming individuals who created direct mail brochures containing challenged claims); *see also FTC v. National Urological Group, Inc.,* Civil Action No. 1:04-C3294 (N. D. Ga. Nov. 10, 2004) (complaint filed naming three companies, their corporate officers and a doctor involved in the product advertising); *FTC v. Direct Marketing Concepts.,* Civil Action No. 04-CV-11136-GAO (D. Mass. June 1, 2004) (complaint filed naming several companies and principals involved in the product development and distribution as well as the production of the infomercial); *Creative Health Institute, Inc. and Kyl L. Smith,* FTC Docket No. C-4108 (2004) (consent agreement included the marketer and the individual who developed the product among respondents). Information on the Commission's enforcement actions is available at www.ftc.gov.

[9] *See, e.g., FTC v. Window Rock Enterprises, Inc.,* Civil Action No. CV04-8190 DSF (JTLx) (C.D. Cal. Sept. 20, 2005) (stipulated final orders requiring a combined total of $4.52 million in redress from various defendants); *FTC v. Great American Products, Inc.,* Civil Action No. 3:05CV170-RV-MD (N. D. Fla. May 20, 2005) (stipulated final order requiring payment of up to $20 million in consumer redress); *FTC v. Seasilver USA,* Civil Action No. CV-S-0676-

the posting of performance bonds prior to marketing.[10] When the marketing of a supplement raises safety concerns, the Commission has required that strong warning statements be placed in labeling and advertising and, in certain cases, has imposed limits on how and to whom the product can be marketed.[11] Finally, as a complement to strong injunctive and monetary relief, the Commission will often use other tools to enhance its efforts to protect consumers from deceptive supplement marketing. In some cases the agency has followed its action against one or more marketers with warning letters to other parties engaged in similar misconduct.[12] The

---

RHL-LRL (D. Nev. Mar. 4, 2004) ($4.5 million in consumer redress).

[10]*See, e.g., FTC v. Braswell,* Civil Action No. CV 03-3700-DT (PJWx) (C.D. Cal. Jan. 23, 2006) (stipulated final orders ban defendant Braswell from direct response marketing of foods, dietary supplements, and unapproved drugs and require defendant Revel to post a $1 million performance bond before engaging in the marketing of any food, drug, or dietary supplement); *see also FTC v. Trudeau,* Civil Action No. 03-C3904 (N.D. Ill., Sept. 3, 2004) (stipulated final order bans Kevin Trudeau from infomercial marketing for all products and services, other than publications).

[11] *See, e.g., Global World Media Corp.,* FTC Docket No. C-3772 (1997) (consent) (warning on ephedra risks and ban on marketing of certain products in media with majority youth audience); *FTC v. Christopher Enterprises, Inc.,* Civil Action No. 2:01 CV-0505 ST (D. Utah 2001) (stipulated final order banning marketing of comfrey products for internal use and application on external wounds).

[12]*See* discussion of purported human growth hormone ("HGH") enhancer products, *infra* p. 8 and text accompanying n. 15.

Commission has also, on many occasions, issued consumer alerts to warn the public about a category of deceptively marketed products or a particular type of consumer fraud.[13]

Recent FTC Supplement Enforcement Actions

In the past year, the Commission has filed fourteen complaints against companies making allegedly unsubstantiated or false advertising claims for dietary supplements or other natural healthcare products, including oral sprays, creams and patches. During the same time period, the Commission obtained orders against forty companies and forty-four individuals, some of those arising from cases filed prior to this year. In addition to broad injunctive relief, these orders required defendants to pay a total of $35.7 million in consumer redress, disgorgement, and civil penalties.

An illustration of the Commission's strong remedies and multi-pronged approach to safeguarding consumers from health fraud is the Commission's recent effort to stop deceptive marketing of alleged human growth hormone products for their purported anti-aging benefits. In May of 2005, the Commission filed a complaint and stipulated final order in federal district court in Florida against Great American Products, Physician's Choice, and two individual defendants. The order settled charges of allegedly deceptive marketing of two dietary supplements, Ultimate HGH and Super HGH Booster, and two sublingual sprays, Master HGH and Super HGH.[14] The Commission challenged claims that these products would provide various anti-aging benefits

---

[13]*See* discussion on FTC consumer education efforts, *infra* p. 13.

[14]*FTC v. Great American Products, Inc.,* Civil Action No. 3:05CV170-RV-MD (N. D.

including weight loss, reduction in blood pressure and cholesterol, and increased cognitive function, immune function, and sexual performance. The order required the businesses to pay up to $20 million in consumer redress – the largest judgment yet obtained in an FTC health fraud case.

To complement this action, the Commission sent warning letters to more than 90 Internet operators who were selling similar alleged HGH enhancers and monitored those operations to ensure that the sites modified or dropped unfounded marketing claims.[15] Finally, because of the prevalence of fraud involving anti-aging products, the Commission issued a consumer alert to help the public spot and avoid imposter pills and sprays claiming to provide anti-aging benefits or the same benefits as prescription HGH.[16]

In the Commission's most recent action involving dietary supplement marketing, the agency challenged allegedly deceptive advertising for four products being promoted by Garden of Life, Inc. and its founder and chairman Jordan S. Rubin through direct mail catalogs, the Internet and magazines.[17] The products included Primal Defense, a "probiotic" supplement marketed to

---

Fla. May 20, 2005) (stipulated final order).

[15]FTC Electronic Letter to Internet Advertisers of Purported HGH Enhancers (May 12, 2005), *available at* www.ftc.gov/os/2005/06/050609greatamericanltr.pdf.

[16]*"HGH" Pills and Sprays: Human Growth Hype?*, FTC (June 2005), *available at* *http://www.ftc.gov/bcp/online/pubs/alerts/hgalrt.htm.* http://www.ftc.gov/bcp/conline/pubs/alerts/hghalrt.htm.

[17]*FTC v. Garden of Life, Inc.*, FTC Matter No. 0323237 (complaint and final stipulated order approved for filing by Commission vote, March 7, 2006).

cure multiple diseases, RM-10, a mushroom-based product sold as an immune system booster and cancer remedy, Living Multi, a multivitamin advertised to reverse memory loss and support weight loss, and FYI, a supplement marketed as an anti-inflammatory. The stipulated final order, which the Commission approved for filing with the court earlier this week, includes broad injunctive relief and monetary relief.

Enforcement Efforts to Protect Young Consumers

The agency's efforts to police the supplement marketplace include especially close scrutiny of products marketed for use by children or otherwise targeted to appeal to young consumers. The Commission has made such youth-targeted products a priority not only because young consumers represent a particularly vulnerable audience, but also because the safety concerns are heightened when children, who are still growing and developing, use products that may have been studied for safety only in adults, if at all.[18] In the past several years, the Commission has taken action against allegedly deceptive advertising for children's supplements touted as various health aids, including cold prevention products, safe and natural alternatives for the treatment of attention deficit/hyperactivity disorder (AD/HD), natural alternatives to steroids for young bodybuilders, and weight loss aids. Some of the products challenged by the FTC have contained stimulants or hormones that raise serious safety concerns or herbs with known toxicity.

[18]A 2001 NIH conference on dietary supplement use in children, for example, found that little is known about the evidence to support appropriate indications for supplement use in children or about the safety of children's supplements. The conference was sponsored by the National Institute of Child Health and Human Development and the Office of Dietary Supplements of NIH. *See* NIH, *Dietary Supplement Use in Children: Who, What, Why, and Where Do We Go From Here* (Feb. 2001), *available at* http://www.nichid.nih.gov/about/od/prip/pastevents/executive_summary.htm.

1. Bodybuilding Supplements Appealing to Young Athletes

The Commission is aware that dietary supplements marketed to increase athletic performance and strength may be particularly attractive to young athletes and bodybuilders. For that reason, in 1999 the Federal Trade Commission challenged ads deceptively promoting a category of body-building supplements that raised safety concerns and were popular among teenage athletes. The Commission brought action against two marketers of supplements containing androstenedione and other steroid hormones, MET-Rx USA, Inc.[19] and AST Nutritional Concepts.[20] Both companies were charged with making allegedly unsupported safety claims for their products, and were required to place strong warnings in future advertising and labeling about the potential risks of using steroid hormones, including unwanted changes in male and female sexual characteristics and increased risk of prostate or breast cancer.[21] The orders in both of these cases also required an additional warning for certain products that contained the powerful cardiovascular and central nervous system stimulant, ephedra, which has since been banned by the Food and Drug Administration.

In bringing these actions, the agency coordinated closely with the Food and Drug

---

[19]*FTC v. MET-Rx USA, Inc.*, Civil Action No. SA CV99-1407-DOC(ANX) (C.D. Cal. Nov. 24, 1999) (stipulated final order).

[20]*FTC v. AST Nutritionals Concepts & Research, Inc.*, Civil Action No. 99-WY-2197 (D. Colo. May 4, 2000) (stipulated final order).

[21]The stipulated final orders required that the following statement be displayed prominently in advertising and labeling: **"WARNING:** This product contains steroid hormones and may cause breast enlargement, testicle shrinkage, and infertility in males, and increased facial and body hair, voice deepening, and clitoral enlargement in females. Higher doses increase these risks. <u>If you are at risk for prostate or breast cancer you should not use this product</u>."

Administration, as well as the Department of Justice's Drug Enforcement Agency and the White House Office of National Drug Control Policy, to better understand the risks these products posed and how young athletes used them. The agency also worked with the National Federation of State High School Associations to help raise awareness among student athletes about the dangers of using any performance-enhancing substances. The FTC also worked with FDA in that agency's issuance of letters warning other companies that the marketing of products containing androstenedione was prohibited.[22]

The FTC is aware that there continue to be potential safety concerns about the marketing of supplements for muscle building, especially to the extent some of the products on the market may contain steroid ingredients. The FTC staff is reviewing web sites and chat rooms popular among young athletes to try to assess how and whether bodybuilding supplements are being marketed to young athletes and what claims are being made about product safety. The FTC staff is also reaching out to responsible supplement industry members for assistance in determining whether misleading marketing to young people is occurring. The FTC is committed to protecting young consumers, both by challenging deceptive safety claims and by working with other authorities and responsible industry members to educate parents and young athletes about the risks associated with these products.

2. Other Children's Cases Raising Safety Concerns

---

[22]The FDA warning letters indicated that such products are adulterated under the Federal Food, Drug, and Cosmetic Act because androstenedione is a new dietary ingredient for which there is not adequate evidence of safety. *See* sample FDA warning letter to manufacturers regarding androstenedione, *available at* http://www.cfsan.fda.gov/~dms/andrlist.html#letter.

When necessary, the Commission has imposed additional remedies, beyond warning requirements, to ensure that potentially dangerous supplements do not harm young consumers. In the Commission's 1997 action against Global World Media Corp., for example, the agency challenged the marketing of a supplement named "Herbal Ecstacy," a product containing a high dosage of ephedra, that was promoted as an "absolutely safe" natural alternative to street drugs to get "high."[23] The product was advertised with psychedelic print and television ads in media with large youth audiences, including MTV and Nickelodeon in some markets. The Commission's order required strong warning statements in advertising and labeling.[24] To further protect young consumers to whom the marketing had been targeted, the order also prohibited any future advertising of Herbal Ecstacy and similar ephedra products in media with a predominantly young audience.[25]

In another matter, the Commission addressed the marketing of several products containing comfrey, an herb associated with severe liver toxicity.[26] Christopher Enterprises, Inc. used the Internet and other media to market various cure-all remedies containing comfrey. Some of these comfrey products were promoted for use in young children as a cough and cold remedy

---

[23]*Global World Media Corp.,* FTC Docket No. C-3772 (1997) (consent).

[24]*Id.* The specific warning for the 1997 order was: "**WARNING:** This product contains ephedrine which can have dangerous effects on the central nervous system and heart and could result in serious injury. Risk of injury increases with dose."

[25]*Id.* The consent order prohibited dissemination of ads for Herbal Ecstacy and similar products containing ephedra in any media where more than 50% of the audience is under 21 years of age.

[26]*FTC v. Christopher Enterprises, Inc.,* Civil Action No. 2:01 CV-0505 ST (D. Utah 2001) (stipulated final order).

and for use in babies and pregnant women for treatment of a variety of infections. The Commission alleged that the company's safety claims were false. Because of the severe risks associated with this herb, the Commission's 2001 consent order banned the company from marketing any comfrey product either for internal use or for application to open wounds. The consent order further required that products sold for external use were required to be labeled and advertised with warning statements making it clear that comfrey can cause serious liver damage and even death.[27]

3. Weight Loss Supplements for Children

With any weight loss advertising, whether to adults or children, the Commission is concerned that consumers not be misled by ads promising dramatic, easy, and rapid weight loss without diet or exercise.[28] Given the concern about the increasing rate of childhood obesity, the

---

[27] *Id.* The warning reads: "**Warning:** External Use Only. Consuming this product can cause serious liver damage. This product contains comfrey. Comfrey contains pyrrolizidine alkaloids, which may cause serious illness or death. This product should not be taken orally, used as a suppository, or applied to broken skin. For further information contact the Food and Drug Administration: http://vm/cfsan.fda.gov." The final stipulated order also included a $1.4 million judgment that was suspended, based upon defendants' inability to pay, provided defendants paid $100,000 in consumer redress.

[28] The Commission's efforts to stop the deceptive marketing of weight loss products to children are part of a larger ongoing effort to stop weight loss scams. Going back more than a decade, the agency has maintained an aggressive law enforcement program against weight loss scams, bringing more than 100 cases against false and misleading weight loss claims. The Commission has also called upon television, newspapers, magazines and other media to screen out facially false weight loss ads before they are run. As part of this effort, the FTC issued its *Red Flag: Bogus Weight Loss Claims* brochure to help media spot and stop false weight loss claims. Available at www.ftc.gov/bcp/conline/pubs/buspubs/redflag.pdf. A recent survey of weight loss ads by the FTC staff suggests that this media screening effort has helped to reduce the incidence of the more extreme weight loss claims. *2004 Weight-Loss Advertising Survey* FTC Staff Report (April 2005).

marketing of dietary supplements for pediatric and adolescent weight loss is a subject of ongoing FTC investigations and law enforcement.

In a 2004 case involving a product called "Skinny Pill for Kids," the FTC challenged advertising by The Fountain of Youth Group, LLC and its principal Edita Kaye.[29] The company claimed on its web site and in other media that Skinny Pill for Kids was the "First thermic and herbal formula ever developed for weight loss for children 6 to 12." According to the advertisements, Skinny Pill for Kids would burn fat, block new fat deposits, normalize insulin and blood sugar levels, reduce the risk of obesity-related diseases including heart disease, high blood pressure and diabetes, and was proven safe by scientific research. The complaint alleged that these claims were unfounded or blatantly false. Prompt Commission action stopped this marketing campaign before the children's product actually entered the marketplace. The Commission staff has also been engaged in administrative litigation in two other matters that include allegedly unproven weight loss products marketed to or for children – "PediaLean," one of many products marketed by Basic Research, purported to provide clinically proven and substantial weight loss in overweight and obese children; and "PediaLoss," a supplement marketed by Dynamic Health of Florida as an appetite suppressant for children age six and older.[30]

---

[29] *FTC v. The Fountain of Youth, LLC,* Civil Action No. 3:04-CV-47-J-99HTS (M.D. Fla. Jan. 28, 2004) (stipulated final order).

[30] *See Basic Research, LLC.,* FTC Docket No. 9318 (June 4, 2004) (complaint). The FTC's complaint also named four other related corporations and three individuals and focused on six of the most heavily promoted products: Dermalin, Cutting Gel, Tummy Flattening Gel, Leptoprin, Anorex, and PediaLean. *Dynamic Health of Florida,* FTC Docket No. 9317 (June 16,

Consumer Education Efforts

The Commission's consumer protection activities are not limited to law enforcement. The agency complements traditional cases with a variety of creative and effective education and outreach for both consumers and industry. The agency's consumer education efforts have been especially strong on subjects related to health and safety. The FTC currently has 39 consumer education brochures, consumer alerts, feature articles, and other pieces available on its web site covering a wide range of health and safety issues.[31]

Several of the FTC's consumer education pieces are designed to warn consumers about unscrupulous marketing of dietary supplements or to educate them about safe and appropriate supplement use. These include pieces to help consumers avoid fraudulent cure-all products on the Internet, tips on spotting weight loss scams, and consumer alerts about ineffective products purporting to treat SARS (Severe Acute Respiratory Syndrome), protect against biological terrorism, cure impotence, and reverse aging. In preparing consumer education materials, the Commission often enlists the scientific and medical expertise of other agencies, such as the FDA and the Centers for Disease Control and Prevention. It also coordinates with these and other organizations to disseminate the information as widely as possible.[32] The FTC also uses a

---

2004) (complaint). Both cases have recently been withdrawn from adjudication so that the Commission can consider proposed settlements.

[31]Links to all of the FTC's health-related consumer education materials are available at www.ftc.gov/bcp/menu.health.htm.

[32]For example, *"Miracle" Health Claims: Add a Dose of Skepticism,* a consumer brochure on common types of Internet health fraud was produced in cooperation with FDA and

variety of means to disseminate the information, often partnering with other consumer and public health officials and organizations to ensure that the materials are available to consumers where they are most likely to make use of them. As one example of the creative means that the agency uses to reach consumers before they are harmed by false or misleading marketing, the FTC has created a number of teaser web sites, that mimic the techniques used by scam artists to sell ineffective weight loss pills, bogus impotence cures, or other products.[33] When consumers visit these sites and attempt to order a product, they are warned that they could have been scammed and are referred to the FTC web site or other sources for more reliable information.

The Commission uses consumer education as an important tool to protect young consumers from marketing practices that could harm them. Those efforts include a variety of topics from protecting young consumers' privacy online, to protecting them from ineffective or unsafe dietary supplement products. For example, the FTC published a feature article in May 2000, to educate families about promotions for children's dietary supplements.[34] That article

---

includes links to other government and public health authorities, such as the National Cancer Institute, the HIV-AIDS Treatment Information Service, the Arthritis Foundation, and others, to provide consumers with reliable sources of health information. In addition, the FTC's consumer alert, *RX for Products that Claim to Prevent SARS?,* was designed to warn consumers against the purchase of ineffective SARS prevention and treatment products and was produced in consultation with both FDA and CDC.

[33]For example, one of the FTC's teaser sites promotes the fictitious "Fat Foe Eggplant Extract," for easy weight loss without dieting. The site uses enticing testimonials, before-and-after photos, and "experts" in white lab coats to mimic Internet weight loss scams. When consumers click through to order they are directed to FTC consumer fact sheets. The site has registered more than 100,000 hits to date. The site is posted in English, Spanish, and French. *See* http://wwww.wemarket4u.net/fatfoe/index.html.

[34]FTC Consumer Feature, *Promotions for Kids' Dietary Supplements Leave Sour Taste* (May 2000), *available at* http://www.ftc.gov/bcp/conline/features/kidsupp.htm.

described the FTC's enforcement efforts against various deceptive promotions of children's supplements and detailed some of the concerns surrounding the safety and efficacy of these products. It also provided practical pointers for parents about safe and responsible use of supplements, urging parents to consult with a pediatrician before starting their child on any supplement. The article was reprinted in large and small markets, and was featured in numerous local and regional radio broadcasts, reaching parents throughout the country. As another example of consumer education efforts to protect young consumers, the Commission is currently working on a project to address the problem of underage drinking.

Conclusion

The Commission will continue to have an active program to challenge deceptive marketing of dietary supplements. It will also continue to use innovative techniques to reach out to supplement users, including parents and young people, to educate them about how to use supplements safely and how to avoid being scammed by unscrupulous marketers. The Commission thanks this Committee for focusing attention on this important consumer health issue and for giving the Federal Trade Commission an opportunity to discuss its role.

Mr. DENT. Thank you, Mr. Peeler.

For Dr. Brackett, I have some questions. First, unlike pharmaceutical drugs, dietary supplement manufacturers are not required to report adverse events to the FDA resulting from their products. That is correct?

Dr. BRACKETT. That is correct.

Mr. DENT. Can you tell us the number of adverse event reports FDA received for dietary supplements over the past year?

Dr. BRACKETT. I am not sure of the exact number at that time, Congress Dent, but I can find that information out for you for the record. I do know it is in the thousands; however, when we receive these adverse event reports, we often don't know if it is a dietary supplement ingredient or something else at that time. So I will just be able to give you the total amount.

Mr. DENT. What, if any, followup action did FDA take at that time? What followup does FDA take in response to these reports or these incidents?

Dr. BRACKETT. What FDA normally does when we receive an adverse event report, whether it be from our CAERS system or whether it be from newspapers or whatever source, is to actually followup and do an investigation to find out actually what ingredients might be in it to find out if there are any ingredients of known safety hazards and try to find out, in fact, if there are any other adverse events related to that product as well as sort of a followup, hopefully narrowing down on some specific ingredients.

Mr. DENT. OK. I know that the FDA had received a large number of adverse event reports regarding ephedra which prompted FDA to take the necessary steps to ban the product. Can you tell us if there are any other dietary supplements which FDA has received a large number of reports and what is FDA doing about those?

Dr. BRACKETT. I don't think there is any ingredient that I am aware of where we have received the large number of adverse event reports that ephedra had experienced.

Mr. DENT. Is ephedra the only dietary supplement that has been banned by the FDA?

Dr. BRACKETT. To this point, yes. That is the only one.

Mr. DENT OK.

Dr. BRACKETT. The other ingredients that we looked at, if we haven't received adverse event reports, we would look at the next tier of ingredients that might look like they might have the same pharmacological or toxicological similarities to ephedra or other products like that and look closer at those ingredients, look for signals that there might be adverse events with those.

Mr. DENT. OK. I would like for you, Dr. Brackett, and also for Dr. Coates to tell me what the FDA and NIH tell consumers about the following supplements identified by Consumer Reports as having potentially dangerous effects yet are widely available in stores, and I do note some of them are banned in Asia, Europe, and Canada. Aristolocia, is it? It is conclusively linked to kidney failure and cancer. I can't pronounce the name of the drug or supplement.

Dr. BRACKETT. Aristolocic acid, aristolocia.

Mr. DENT. Correct.

Dr. BRACKETT. In many cases where we were aware of these, they actually have not been included in dietary supplements. They are often in other sources such as beverages or teas that people might have taken that may not meet necessarily the definition of dietary supplement.

Dr. COATES. And in the case of the NIH, since we rarely have any experience with ingredients like aristolocic acid and because FDA has the authority to regulate in this area, we customary refer to material on the FDA Web site or refer them to the FDA.

Mr. DENT. Another issue: Is it yohimbi, the sexual stimulant that leads to heart and respiratory problems?

Dr. BRACKETT. A number of these ingredients, we are aware of these, and we have been for the last several years looking at those ingredients, looking at their presence in dietary supplements and trying to identify exactly what the specific pharmacological part of that could be so that we can make some scientific judgments, and this does take a bit of background and scientific sleuthing to determine this.

Mr. DENT. Which ingredients are you looking closer at?

Dr. BRACKETT. Well, any of those that may have been listed in the Consumer Reports article that you said and as well as others that appear either structurally or pharmacologically similar to this them.

Mr. DENT. Dr. Coates.

Dr. COATES. There is very little scientific information to my knowledge about yohimbi, and so we don't have any presence in that area. People ask us very frequently about products like these. We refer them or try to help them to navigate through available information such as that in the FDA.

Mr. DENT. I guess back to Dr. Brackett. Does FDA or NIH initiate a clinical trial or study to determine the safety of a supplement that has been banned in another country?

Dr. BRACKETT. The FDA doesn't conduct any clinical trials. We do rely on other scientific partners, such as NIH and others, including academic institutions, and evaluate the studies that they do conduct on these ingredients and try to assimilate all of the scientific information from whatever source.

Dr. COATES. From the NIH point of view, to my knowledge, the NIH has not conducted clinical trials on unsafe ingredients or that have been determined to be unsafe in other jurisdictions.

Mr. DENT. At this time, the chair recognizes Mr. Cannon.

Mr. CANNON. Thank you, Mr. Chairman.

Dr. Brackett, I have several questions for you. I think you have been involved in a lot on this stuff, and I would just like to get a couple of issues out. On the products that were mentioned in the October 18th Washington Post article, they are misbranded. They have been adulterated, confused with steroids. They are not dietary supplements, but they are actually elicit drugs?

Dr. BRACKETT. That is correct. That is in our contention in this case.

Mr. CANNON. Would you also confirm that if a steroid or any other product is marketed as a dietary supplement, it doesn't actually make it one.

Dr. BRACKETT. That is true. If it has a structure function claim much as the case that the warning letters that were sent out did, that would put them in the definition of drugs.

Mr. CANNON. Then, too, can you confirm that your agency has testified before this committee in the past that DSHEA, the Dietary Supplement Health and Education Act, provides you with ample and sufficient authority to regulate those products that are dietary supplements?

Dr. BRACKETT. Well, I think as provided in the appendix, there are numerous enforcement actions that we have taken under DSHEA. So it does show that, in fact, it does provide an ability for us to take action on safe dietary supplements. As you know, in the case of ephedra, we have court cases there. Before we would go forward and see if there is not enough authority under DSHEA, we would have to see how that turns out. At this point, the administration has no plans to suggest any modifications to DSHEA.

Mr. CANNON. So in short, you believe you do have ample and sufficient authority to regulate in this area?

Dr. BRACKETT. At this point, we have no reason to think we don't.

Mr. CANNON. Thank you. It has been about 3 years since the agency promulgated the proposed GMP rules. The new GMP that is coming out, is it a proposed final rule or a rule subject to comment so we can allow for additional comments based upon the changes that have been made over what has not been a relatively long period of time and maybe get a final feedback, set of feedback, on it before those rules become final?

Dr. BRACKETT. At this point, the new dietary supplement GMP, has left the agency and is in the very final stages of the administration review. We do hope to have this actually out very soon.

Mr. CANNON. Very soon means?

Dr. BRACKETT. Well, it is out of FDA's hands at this point. I would fail to predict a specific date, but since it is in the very final stages, it is just a matter of a very short time.

Mr. CANNON. The way the rule has developed—and by the way, I chair the Commercial Administrative Law Committee of the Judiciary which oversees the APA, and so we have a particular interest in this over there. My sense is this really was built in different parts of the agency, and so as it has come together, you had a proposed rule and then you dealt with the rule, it seems to me, in different parts, and how can anybody be sure unless you are in charge of those all those parts, and even then, I guess my concern is I represent a large number of high quality manufacturers who really want those GMPs out there, but I personally as a Congressman don't want to see the cost of nutritional supplements, which I use a lot of, to go up for me and for the consumers, and so I am concerned that the final rule have some input for people who are looking at it from their perspective and they may be different from the perspective we have gotten someplace along the line, or maybe it would be a coherent perspective where there may have been some pieces missed. Is it possible, would you consider, would the agency consider doing this not as a final rule, but as a final rule with comment or a proposed final rule?

Dr. BRACKETT. Well, this is something I think that we would be willing to talk with you about. I am not able to answer at this time. I will say that the way that the rule was developed, with our proposed rule, it was a very complicated rule, one of the largest we have ever done. We got many, many comments, and much of what was considered there was the economic benefit and cost of the rule, and all of those have been taken into account in the final rule.

Mr. CANNON. Of course, they have to be taken into account. The concern is as it all gets balanced, do we need some other views. You heard my opening statement. I believe that we are at a time when we are going to have these dramatic changes in the science that backs health up, and in that process, I think over the last year or 2 or 3 years, we have spend $128 million in Federal funding of nutritional supplement research which has yielded profound results, and I think we are going to see more of that. In the process, I want consumers to be incented to have good health and to take the supplements that they need as they get more and more information and not create a hurdle of costs that could be promulgated through these rules or along with these rules.

So perhaps we can talk about it a little bit more, and this is not to say the rule is bad. I want you to understand the whole industry, at least the good guys in the industry, want those rules out there. They want them promulgated. I am saying from the outside, yeah, you may want them, but let us make sure that we get rules that are not going to up costs unreasonably, because dietary supplements typically are powders. They are not fluids. The kind of controls that are demanded are such that it might significantly affect costs. I find that very unfortunate at a time when we are in transition.

Thank you, Mr. Chairman. I see my time has expired. So I yield back reluctantly, but thank you.

Mr. DENT. I would be happy to give Mr. Cannon some more time right now.

Mr. CANNON. Thank you. I would like to sort of pursue, go farther on the GMPs.

I think I expressed my concern. Let me just tell you that my industry is not telling me to say this. This is Chris Cannon, the consumer and the guy who has a lot of consumers in his district that he is worried about the GMP issue.

The media has repeatedly claimed that the dietary supplements industry is unregulated despite the FDA authority. We talked about that a little bit earlier. Do you believe that the FDA is moving in the right direction to regulate the dietary supplement industry, Mr. Brackett?

Dr. BRACKETT. Yes, Congressman, I do, and it is not true that it is unregulated. It is regulated. We do and have in the last year and or two tried to even be more transparent about the way we will regulate, both the way that we will evaluate the safety of both and new dietary ingredients. Our expectation is of the industry, much of which will focus on the GMPs and the common level playing field the industry will have, and we will continue to consider any new ways to be much more efficient and scientifically balanced in our evaluation of dietary supplements.

Mr. CANNON. It seems to be beyond question that the GMPs are really a valuable tool in helping consumers choose and helping consumers get what they pay for, and so I am anxious to see those come out one way or the other.

Can you talk about the regulatory framework that we now have and as it is evolving with GMPs?

Dr. BRACKETT. At this point, we are trying to make sure we use every provision of DSHEA, make sure that it works. At some point in the future, if we would learn that something didn't work, then we might consider whether we have enough authority.

Mr. CANNON. Let me direct this to you, Mr. Bracket, and also to Mr. Peeler: What role does the Drug Enforcement Agency have in relationship to your agencies in policing companies who are producing or selling illegal manufactured or elicitly marketed drugs or steroids as dietary supplements?

Mr. PEELER. Well, I can start. If in the course of our investigation we determine that the issue is the selling of an illegal product rather than false and deceptive claims about a dietary supplement, we will certainly be in contact with both the FDA and the DEA to determine what enforcement options are available.

Mr. CANNON. So you have open channels with DEA to say this may be a deceptive ad, but it may be an ad that actually says what it is.

Mr. PEELER. Right.

Mr. CANNON. If it is not deceptive, then you have a channel to move those kinds of enforcement actions over to DEA?

Mr. PEELER. We have open communications with them, yes.

Mr. CANNON. Is that a standard; have you created a standard channel, or is this just people know each other in the agencies?

Mr. PEELER. It is people that know each other in the agencies. I mean, the DEA and FTC and FDA have been working together in this area for many, many years, and there is a very good informal working relationship between the agencies.

Mr. CANNON. I can't tell you how much I hate these kinds of hearings where the whole industry gets tainted because you have some truly bad actors, criminal actors out there, and I know they are just civil violations, but there are bad actors polluting the whole system.

Mr. Peeler, does your agency patrol the Internet to find companies and prevent them from acting like the ones that are identified in the October 18th Washington Post article, those that claim they sell dietary supplements who are actually selling illegal drugs?

Mr. PEELER. We do monitor Internet promotion and we often will do sweeps together with the State Attorney Generals or with other Federal regulators like the FDA. Again, our focus is really on whether the claims that are being made are truthful and substantiated. As your previous question indicated, if the issue is are you selling an illegal substance over the Internet, then it does become an issue we would discuss with the FDA, DEA, or the Department of Justice which actually has a role in the marketing of all illegal substances over the Internet.

Mr. CANNON. Do you know if they are out actively looking on line for these kinds of elicit illegal criminal compounds that are being sold?

Mr. PEELER. I don't know that. I do know that when we see them, we would notify them of it.

Mr. CANNON. Can you talk to me a little bit about what the steps are the FTC takes to go after those companies that are selling illegal drugs or that are selling drugs that are mislabeled or have misleading labels?

Mr. PEELER. Again, our focus is on whether the advertising claims or the promotional claims are truthful and whether they are substantiated. So again, if it is a question of is it a drug, a legal drug, we would refer it to other agencies.

Mr. CANNON. But back to the inappropriate advertising of the drug, do you have a process for looking at this industry? Are you going after these people that are mislabeling their drugs?

Mr. PEELER. We have a very active enforcement program that looks at deception, substantiation. You mentioned good companies and bad companies in the industry. We receive a lot of support from the good companies in the industry. They are often the source of leads on things that we should look at. In cases where you have a real spike in public interest in particular things, like anthrax a few years ago, we will often in connection with the Food and Drug Administration do surfs to make sure that people aren't marketing cures for anthrax, ineffective cures for anthrax, and we receive great support from the industry in those types of efforts also.

Mr. CANNON. Before I yield back, Mr. Chairman, let me just point out that not all companies that report on other companies are good companies. It is a terrific marketing and competitive tool, but we appreciate the job you are doing.

Mr. PEELER. We understand that, and we are very careful in evaluating those types of complaints. We are looking for evidence that consumers are being injured, not the companies being injured.

Mr. CANNON. Interestingly, Mr. Chairman, if I could make one point, the companies that I believe are the good companies have all said essentially that to me, that they are not afraid of the regulatory process because you guys have been thoughtful in the way you have prosecuted these kinds of things. They have all had their competitors submit their products for one reason or another and they feel like they have been fairly treated. So all regulation and all Federal regulation is not bad, and we appreciate your role in that and the evolving role of your agencies in this industry.

Thank you, Mr. Chairman. I yield back.

Mr. DENT. The chair thanks the gentleman and the chair recognizes the gentleman from California, Mr. Issa, for 5 minutes.

Mr. ISSA. Thank you, Mr. Chairman.

I have been a pretty unabashed supporter of the growth of, if you will, the nutritional supplement industry, but I have also been somebody who has begun to question where and when we are going to draw the line on claims that drugs can't make that nutritional supplements are making. I am wondering more than anything else when I am going to stop hearing about cures or treatments of diseases that, in fact, no drug can claim what nutritional supplements presently can claim.

Dr. BRACKETT. Well, Mr. Congressman, I will dare say you will never hear the end of that. That has been going on the hundred years that FDA has been in existence, and I am sure that will con-

tinue; however, when we do see that, we do take that very seriously. We aggressively try to enforce the rules to make sure that does not happen.

Mr. PEELER. And I would add that those are clearly priority cases for the FTC and we have been recently able to get good strong remedies. In one recent case that we settled, the individual proprietor was banned from the direct sale of any dietary supplements in the future under Federal District Court order.

Mr. CANNON. Would the gentleman yield just on that point?

One of the real interesting things in this area is not so much the claims that people promote legally or illegally, and there may even be some gray area there. The interesting thing is the kind of data that has been made available that people can understand and make evaluations of in a market where you have a free flow of information. That, I think is one of the priorities of this industry, because that goes to the core of, I think, your concern, which is bogus claims and people whose health deteriorates because they rely on claims that are not only unsubstantiated but unscientific.

Mr. ISSA. I guess the balance part of that question is I look at people who are, for example, dealing with calcium supplements and so on, and as far as I can tell, whether calcium helps you or doesn't help you, it is about as clear as whether aspirin does or doesn't help you, and yet aspirin is marketed as a drug with substantial research that indicates maybe it does, and yet you look at somebody wanting to sell something like calcium supplements and they are constantly in a changing tide of whether or not they can make any claims on it.

Could you comment further on is there going to be at least from the administrative standpoint a clearer path for when there is some indication—I always use Florida orange juice as the best example. You know, to be candid, Florida orange juice gets away with something that no pill can in its claims. California orange juice, by the way, was not mentioned.

Dr. BRACKETT. Yes, Congressman. I think that we are trying to provide a way under our provisions for the qualified health claims both for conventional foods and dietary supplements where if it is a significant scientific agreement, there is no problem with the claims; otherwise, there may be claims that could be made based on the degree of scientific evidence to date. So that does allow the free flow of information to consumers. As we have evolved in our process for reviewing these, we have made it clear to the industry what sort of evidence they would need to reach a certain conclusion.

Mr. PEELER. And just to followup along the same lines, starting with orange juice, we actually did just this year enter into an order with Tropicana, and it involved advertizing where they went over the line. They overstated what the studies actually said they could do, and we called them on it. We are not saying that orange juice is not a good food or not a good product, but they claimed more than they could have.

But as you started out, the real problem we face are not people that are misstating the evidence, but people that are claiming their dietary supplements can cure cancer or treat virtually every disease known to man.

Mr. ISSA. And then last—I know my time is running out and I apologize. I stepped out for another committee for a moment, but nowhere in the written information that I see, if you will, how you are going to deal with the growth of the Internet which seems to have completely exploded what conventionally we thought of as enforcement of outlandish claims.

Mr. PEELER. Well, if I could start, we see the Internet as a challenge in the full range of advertising regulation that we do. We have been adapting the way that we do business to address Internet advertizing, including setting up within the Commission a separate intent lab that is outside of our firewall so that we can go out on the Internet anonymously and check claims onsites. One of the real challenges of the Internet, though, is you don't know where people are, and in our general enforcement, we find one of the problems is when we track down people, often they are located offshore.

So one of the things the Commission has asked for generically is an improvement of our ability to share information internationally with other law enforcement agencies to promote law enforcement cooperation on an international basis.

Mr. ISSA. And who has jurisdiction to give you that?

Mr. PEELER. The Senate Commerce Committee has reported out legislation called the U.S. Safe Web Act, and it is exactly what we need.

Mr. ISSA. Thank you very much. I yield back.

Mr. DENT. The chair recognizes the gentleman, Mr. Van Hollen, for 5 minutes.

Mr. VAN HOLLEN. Well, thank you, Mr. Chairman, and thank you for your testimony. As you know, we have been in votes. So I am trying to run back and forth, but I appreciate all of you being here and the testimony.

Let me just ask you, if I could, Mr. Peeler, with respect to the FTC's control and regulation of claims made about different products whether or not you think you have the resources available to cover the claims, the many claims that are made by people advertising these different products with respect to what they can do for people's health and whether they are safe or not.

Mr. PEELER. Well, every agency would like to have more resources. I think that we have put the right amount of emphasis on resources in this area. As I said in my opening statement, this has been, dietary supplement health claims has been, an area where we actually have been very, very active over the course of the last 10 years.

Mr. VAN HOLLEN. Let me ask you about a particular claim, because it has gotten some attention. Some companies are now marketing DHEA, which is a steroid precursor and they are marketing it as an alternative to Andro, which is another steroid precursor that was taken off the market by FDA. There is one Internet ad out there for a product called Andro Shock. It claims that the combination of a variety ingredients, including DHEA, tangot, ali, bulgari, and some other ingredients can result in, "explosive gains in muscle growth."

My question to you is, is there enough sufficient evidence to support the claim that DHEA in combination of these ingredients re-

sults in what the company claims it does, namely these kind of explosive gains in muscle growth?

Mr. PEELER. The way we would determine that is to obtain the information from the company and evaluate it often with the assistance of the Food and Drug Administration. We in the last couple of years have settled a number of cases involving claims made for DHEA, primarily anti-aging claims, claims that if you take this, you will stay young.

Mr. VAN HOLLEN. Well, with respect to my question though, have you had an opportunity yet to look at that claim that has been made and make a finding?

Mr. PEELER. We have not made a finding on that specific claim.

Mr. VAN HOLLEN. Are you looking at it now?

Mr. PEELER. I can't discuss publicly whether we have a particular investigation, but we can certainly submit that information to the committee.

Mr. VAN HOLLEN. All right. Is there any evidence to the knowledge of anyone on this panel that particular product poses a health safety issue?

Dr. COATES. I could comment from the point of view of the National Institutes of Health. I can say almost with complete certainty that combination has never been evaluated in a clinical relevant way for either efficacy or safety.

Mr. VAN HOLLEN. All right.

Dr. COATES. The combination.

Mr. VAN HOLLEN. All right. Well, let me just ask the general question if you have a product out there where evidence comes forth that is there some question of a threat to public health, you begin to hear personal testimony, you interview the people, you find the testimony to be credible, why shouldn't we at least then require, No. 1, the company selling these products to begin to, No. 1, to do some self-reporting? I want to commend my colleague Mrs. Davis from California for her efforts in this area. Why shouldn't we require them to at least keep track of these reports and allow you, the FDA, to make some evaluation whether there is an indication of health safety problems and they can make a finding as to whether or not these are safe products or not safe products?

Dr. BRACKETT. Congressman Van Hollen, we actually have at FDA have with Congress in looking at some of the technical background for mandatory adverse event reporting. We haven't taken a position on that specifically, but the one thing that is important to point out is that any kind of adverse event reporting system is just one signal among several or many that we will use to take action on a specific ingredient or company.

Mr. VAN HOLLEN. Right, but you are in the process, you say, of determining whether or not the administration is going to support that kind of mechanism, in other words, a requirement of adverse event reporting?

Dr. BRACKETT. Well, we are not opposed to it. In fact, that is why we are working with Congress to try to formulate something that might work.

Mr. VAN HOLLEN. All right. Thank you. Thank for your testimony.

Chairman TOM DAVIS [presiding]. Thank you very much.

I would ask unanimous consent that Mrs. Davis of California who has been very active on this issue to be allowed to participate today, and hearing no objection, so ordered.

Mrs. DAVIS OF CALIFORNIA. Thank you.

Chairman TOM DAVIS. You are going to participate, but I am going to keep you on the list. I think Ms. Watson and me are going to go back and forth.

Dr. Brackett, unlike pharmaceutical drug companies, dietary supplement manufacturers are not required to report adverse events to the FDA resulting from their products; is that correct?

Dr. BRACKETT. That is correct.

Chairman TOM DAVIS. Dietary supplements containing ephedra have been banned. Well, let me put it this way: These two bottles of dietary supplements are labeled as containing ephedra. Just a couple of blocks from the Capitol, our staff went up and purchased these yesterday, one of which, Lipodrine, is the same supplement involved in FDA's recent seizure of $3 million from High-Tech Pharmaceuticals in Georgia. Additionally, dietary supplements containing ephedra are widely available on the Internet. Again, we were able to locate 10 different Web sites that will allow them to purchase these products. Dietary supplements containing ephedra have been banned since 2004, but they are still widely available, two blocks from the Capitol.

What enforcement action is FDA taking to prevent the continued use of these supplements?

Dr. BRACKETT. Well, Mr. Chairman, we are aware that these occur and it does trouble us. What we are trying to do is focus on those manufacturers and distributors that have the biggest production so that we can make, first of all, a public disclosure that we have taken action, and the example you shared, in Georgia 2 weeks ago, was one example of how we do get those off the streets. What we do in the cases of the ingredients or at least the bottles that you just showed is we often use our own shopping to track down who is actually still manufacturing those.

There is the mistaken belief by some in the industry that simply because several of the cases are in litigation that, in fact, the ban is off, and that is not true.

Chairman TOM DAVIS. What is FDA doing to remove the products from store shelves that were manufactured by High-Tech, like this bottle, Lipodrine?

Dr. BRACKETT. We did a seizure on the products at High-Tech. I don't know that it has gotten to the point of market withdraw from those products or not, but I can get back to you with the specifics.

Chairman TOM DAVIS. We are well aware of the Federal District Court in Utah ruling that the ephedra ban didn't apply to one particular manufacturer, and now I understand that High-Tech Pharmaceuticals has asked for a preliminary injunction to force FDA to return the $3 million of ephedra supplements it recently seized. What is the legal status of FDA's ephedra ban on dietary supplement?

Dr. BRACKETT. It is still in effect with the exception of the products that are under litigation, which are under 10 milligrams product.

Chairman TOM DAVIS. Dr. Coates, what research is conducted on the effects of the dietary supplements for certain populations? For example, some experts believe that the DHEA should have been included in the Anabolic Steroids Control Act because it turns anabolic in the body and it is performance enhancing. We know that anabolic steroids can be harmful to youth whose bodies are still growing and developing, but DHEA is a very popular energy-boosting supplement for the senior population. Would it be appropriate for certain supplements to be sold only to certain populations, for example?

Dr. COATES. Thank you for the question, Mr. Chairman.

NIH currently funds research in some populations on DHEA, looking at metabolic and biological effects. These are very narrowly focused. To my knowledge, NIH is not currently funding any clinical trials of DHEA. but I would be very happy to try to provide that information one way or the other for you.

I think perhaps what I might comment on is that the impact of something like DHEA on one population does not necessarily have any anything to do with the potential biological effect on another population. In my opinion, if somebody were to focus a product or an ingredient toward a particular population, it is incumbent upon them to have actually done those studies.

Chairman TOM DAVIS. Mr. Peeler, Internet sellers don't necessarily have fixed addresses. Has the FTC been active in pursuing cases of Internet fraud, and if you are, how do you do it?

Mr. PEELER. We have been very active. The Internet has really opened up a whole new frontier to scam artists, and we have brought a number of cases and we have taken a number of steps to improve our ability to take action against Internet fraud, including setting up an Internet lab that is outside of the Federal Government's firewall that we can use to survey sites and get information about what is going on. As you noted, one of the problems is finding out where people are, and one of the other problems is once you find out where people are, sometimes they are overseas.

So we have been working to develop cooperative enforcement relationships with other regulators in other countries, and the one sort of generic improvement that we think would be very helpful for us is additional authority to share information with foreign enforcement officials. There is legislation called the U.S. Safe Web Act that has been reported out of the Senate Commerce Committee that would do exactly that, and we are definitely hoping that will be enacted by Congress.

Chairman TOM DAVIS. Thank you very much.

Ms. Watson.

Ms. WATSON. Mr. Chairman, I am going to yield my time to Mrs. Davis, and I would like to reclaim it when she finishes.

Chairman TOM DAVIS. Mrs. Davis.

Mrs. DAVIS OF CALIFORNIA. Thank you.

Thank you, Mr. Chairman. I certainly appreciate the opportunity to sit in today, and I am sorry I missed some of the earlier testimony today. As you may know, I have been involved in this issue for some time, largely because I have constituents in San Diego who came to me, and I also served as the Consumer Protection

Chair on the State of California Assembly, and we heard frequently from individuals.

I know that there are obviously some wonderfully positive effects of dietary supplements. What we have been concerned about is the education, really, for consumers and trying to kind of close a loop between consumers who believe through advertising and just generally through the media that these products are safe when, in fact, they don't understand or realize that there hasn't been the kind of rigorous testing that perhaps they might assume from products being on the market.

I wonder if you could share with me, you mentioned that you are working with the Congress and I am pleased to hear that, that you are looking at the USA Safe Web Act, and you also mentioned that you would have some interest in adverse event reporting, although I think you haven't really taken a position on that. What would be the kind of ideal legislation that you see would help to close that loop between having products on the product market and giving the FDA the ability to really ascertain the extent to which there is a problem out there?

Dr. BRACKETT. There are a number of different sort of ideal sort of facets, one of which would be the speed with which we would get the adverse events, the degree of specificity about the ingredients so that we could really tell what, in fact, the adverse event was about, and also the ability to work together with our colleagues in the government, such as FTC, to try to see if they are aware of any connection between any adverse events as well, and perhaps deceptive advertising.

Mrs. DAVIS OF CALIFORNIA. Is there a mechanism for that? What would you consider that mechanism to be?

Dr. BRACKETT. Well, I am not sure of a specific mechanism. I think because this is largely a data-driven sort of system, I think having data systems such as our CAERS system that can quickly and accurately handle all sorts of situations, I think is the first step.

Mrs. DAVIS OF CALIFORNIA. Does anybody else care to weigh in on that? I guess what I am looking for is do you see some kind of self-reporting that would work with some standardized reporting mechanisms, or is it really the responsibility of—whose responsibility is it to try to get that information?

Dr. BRACKETT. One point that I could mention to you is our CAERS system within the Center for Food is just one part of several adverse event reporting systems within the Food and Drug Administration. Often when there is an adverse event reported, we don't know whether it is a dietary ingredient, whether it is a food or, in fact, may have been a drug interaction. So it is important that we coordinate with the other centers at FDA, and we are in the process of doing that to have a more robust reporting system that is inclusive of all the different products.

Mrs. DAVIS OF CALIFORNIA. One of the concerns that I think people have raised is the combination of ingredients, and certainly caffeine is one where we know that the concentration of caffeine can create an adverse effect, perhaps, with an ingredient that isn't harmful in and of itself. To what extent is the work that you are doing trying to get at that issue, of that concentration and how

those adverse impacts work? I guess the only other question really is whether we are dealing with diverse populations, whether age, medical problems. Certainly with young people, there may be additional issues that we wouldn't see necessarily in an older individual, and how are we testing or how are we trying to get at those issues?

Dr. COATES. I can answer part of that, I think, on behalf of the National Institutes of Health. NIH is the home, specifically the National Institute for Environmental Health Sciences, is the home of something called the National Toxicology Program, which is a joint effort between NIEHS and NIH—sorry for the acronyms—and the National Center for Toxicological Research at the FDA, and their job is to evaluate the potential for toxicity in some standard animal model settings. So these are preclinical studies, not clinical studies.

At the moment, and Dr. Brackett might be able to comment a little more, one of the studies that is going on, actually, is looking at citrus arantium, which is one of the ephedra replacement products or ingredients that is in the marketplace, and while I don't have specific details of the protocol, I am aware that among the questions being asked have to do with citrus arantium plus-minus caffeine in the animal models. That is an example of the approach that is taken.

Mrs. DAVIS OF CALIFORNIA. Thank you very much. Thank you, Mr. Chairman. I really appreciate it.

Chairman TOM DAVIS. Thank you for participating and thank you for your leadership on this issue.

Mr. Cannon.

Mr. CANNON. Thank you, Mr. Chairman. I just wanted to follow-up on one question you asked Dr. Coates.

Dr. Coates, the question was about clinical trials for DHEA, and you responded you weren't aware of or there were none. A lot of doctors have been prescribing DHEA. A lot of people have been taking DHEA at various ages. It pretty much appears that there is a population of older people who are taking it. Have you considered doing a non-double blind study, what I would call like a Beazian study, where you take people that have taken DHEA, evaluate all of the aspects of their lives, and then try to determine what the effect has been? Has that been considered? Have you looked at doing that in your agency?

Dr. COATES. Thank you for the question, Mr. Cannon. Our office does not directly conduct clinical trials of dietary supplements; however, we do work with other components of NIH in elaborating designs for clinical trials.

Generally speaking, dietary supplements for clinical trials have not been done by using that Beazian model, at least that I am aware of for dietary supplements, but we are always challenged to try to figure out what the best clinical trial designs are for these kind of agents, sometimes for reasons that may not be perfectly obvious. One of them is that they are present in the marketplace and they are not the sorts of things that consumers necessarily must seek professional guidance from their physicians about. So there is this challenge of being able to do effective clinical research in an environment where they are already part of the landscape.

Your notion of this kind of clinical trial design is an interesting one, and I would be very happy to try to followup on it.

Mr. CANNON. Thank you. Currently, have you been evaluating? You guys, sort of your agency sort of helps direct these studies or works with how they are designed. Do you know if you have actually been working on that in the past?

Dr. COATES. I will claim ignorance on this, Mr. Cannon, because I don't know the answer to it.

Mr. CANNON. This, I believe, is an area where this is transformational. It is only a few months old, the possibility of doing this. We have only recently had the tools, and so I would love to work with your office and talk about some of those things and about what kind of outcomes we can look for that I think would be very helpful. I think everybody in the industry would love to see some of that happen.

I mean, I am getting to the point in life and I know many people of this baby-boom age are looking at a transition and want to live long and healthy and then die suddenly instead of creeping toward the grave, and learning a little bit about dietary supplements and how they actually affect people, I think is important to many of us. So thanks. I would love to talk to you about it further.

Mr. Chairman, I yield back.

Mr. ISSA [presiding]. Thank you.

Ms. Watson, I believe you have one more round of questions.

Ms. WATSON. Yes, very quickly, and this would go to Mr. Peeler.

DHEA, if a parent wrote to you who had discovered that her child was taking DHEA supplements, would you be able to reassure that parent that it is safe, and since they are taking it because the child probably feels that there will be muscle growth and all kinds of gains for their ability, say, to play a particular sport, how would you respond to that parent?

Mr. PEELER. Well, I think that is really a very important question, and at our agency, we are an agency of lawyers and economists that are engaged in law enforcement. What we would do is repeat the basic advice that we have on our Web site and our consumer education material, which is that any parent who is considering having their children start taking any dietary supplements should start by consulting their own health care provider and keep that health care provider informed about any dietary supplement use. If we had the letter come in directly to us, we would also go to the Food and Drug Administration and see whether the Food and Drug Administration had more specific advice that they could give.

Ms. WATSON. In that answer, would you suggest that child go see the medical doctor?

Mr. PEELER. We would suggest that the parent consult their health care provider before they start a child on any dietary supplement regime.

Ms. WATSON. Thank you. That is it.

Mr. ISSA. Mrs. Davis, do you want a second round?

Mrs. DAVIS OF CALIFORNIA. No. Thank you.

Mr. ISSA. With that, I would like to thank our panel for taking us half of the way to the finish line here and thank you once again and ask for our second panel to come up.

Mr. ISSA. While you are finishing getting set up, I would like to recognize the panel, our second panel: Kathleen Jordan, general manager, Dietary Supplements for Functional Foods Program, NSF International; Dr. V. Srini Srinivasan, vice president, Verification Program, U.S. Pharmacopeia; Dr. Tod Cooperman, president and founder of Consumerlab.com, and Ms. Janell Duncan, senior counsel, Consumer Union.

For those of you who were here on the first panel, you know it is policy of this committee to swear in all witnesses. So I would ask that you please rise and raise your right hands. Also, anyone in the back row that is going to assist or may be called on to testify, also rise at this time if you are going to answer questions if asked. It makes it easier for us.

[Witnesses sworn.]

Mr. ISSA. Thank you. You may all be seated.

Now, in order to maximize the Q and A, which as you have probably already noticed we are better at than we are at listening in general, we are going to ask that all of your written testimony with unanimous consent will be placed in the record, and we would ask you to speak over and above or from that if you feel necessary, but try to limit to 5 minutes. We are beginning with Ms. Jordan.

STATEMENTS OF KATHLEEN JORDAN, MS, RD, GENERAL MANAGER, DIETARY SUPPLEMENT CERTIFICATION PROGRAM, ON BEHALF OF NSF INTERNATIONAL; V. SRINI SRINIVASAN, Ph.D, VICE PRESIDENT, VERIFICATION PROGRAM, U.S. PHARMACOPEIA CONVENTION, INC.; TOD COOPERMAN, M.D., PRESIDENT AND FOUNDER, CONSUMERLAB.COM; AND JANELL MAYO DUNCAN, SENIOR COUNSEL, CONSUMERS UNION OF U.S. INC.

STATEMENT OF KATHLEEN JORDAN

Ms. JORDAN. Good afternoon, Mr. Chairman and members of the committee.

Mr. ISSA. And I will tell you that you have to look at those things to really make sure the green light is on, because it will fool you. When you hit it, you sometimes hit it twice. Thank you.

Ms. JORDAN. Thank you and good afternoon, Mr. Chairman and members of the committee.

My name is Kathleen Jordan. I am a registered dietitian and the manager of the Dietary Supplement Certification Program at NSF International. I would like to thank you for the opportunity to appear before you today to discuss your involvement in dietary supplements in sports nutrition products and the independent role we play in the evaluation and certification of these products.

NSF International was founded at the School of Public Health at the University of Michigan in 1944. We are an independent not for profit 501(c)(3) organization that develops national standards and tests and certifies products that have the potential to impact public health, primarily through the foods we eat and the water we drink. NSF has successfully provided third-party certification solutions to support a variety of regulatory and public health initiatives. Our standards development and product certification programs are fully accredited by the American National Standards Institute.

In addition, NSF is a world health organization collaborating center for food and water safety. We currently employ 450 professionals comprised of chemists, microbiologists, toxicologists, and food scientists among many others. NSF standards development follows the ANSI process in OMB Circular A–119, Requirements for Federal Agency Participation in Consensus Standards. All NSF standards are reviewed and approved by an independent external council of public health consultants with no ties to industry. This council, which includes representatives from EPA, FDA, CDC, and other Federal agencies assures that NSF standards are protective of public health.

The product categories we test and certify address food safety, water quality, environmental health, and dietary supplements. For dietary supplements, NSF worked with key stakeholders, including FDA to develop the U.S. national standard for dietary supplements known as NSF ANSI 173. The NFS certification program based on this standard allows consumers to identify compliant products and helps them make informed purchasing decisions. It should be noted that neither this standard nor the certification address product efficacy in any way.

Companies seeking product certification against this voluntary standard are involved in a five-step process: Step one, an application is filed and a binding certification contract signed. Step two, formulations and labels are evaluated by NSF toxicologists for safety and accuracy. We do review label claims, by the way. Step three, all facilities that make those products are inspected for good manufacturing practices. Step four, products are tested for identity, quantity, and contaminants such as heavy metals, pesticides, bacteria, and adulterants. And, finally, step five, followup plant inspections and product testing are conducted semiannually.

As specified in the standards, product ingredients deemed a public health or safety hazard by a regulatory agency are not eligible for certification. Would you like me to repeat that?

Mr. ISSA. Please do.

Ms. JORDAN. As specified in the standard, products and ingredients deemed a public health or safety hazard by a regulatory agency are not eligible for NSF certification.

Because of our experience in the dietary supplement certification area, the National Football League and the National Football League Players Association requested our assistance in developing and administering their supplement certification program. In addition to meeting the requirements of NSF ANSI Standard 173, we test each lot for substances banned by professional football. We believe this program effectively addresses one key aspect of the banned substances problem. Building on these problems, our new athletic banned substance certification program is designed to meet the growing demands from athletes, coaches, regulators, and parents.

Recently, Major League Baseball and the MLB Players Association have expressed support for and recommend this new program. In the future, the Canadian Center for Ethics in Sport will do the same.

We stand ready to work with FDA, this committee, manufacturers, and the sports community as a whole to create a level playing

field for all professional, amateur, and youth athletes who are dedicated to fair play in sports. The NFS certification mark on a product is an easy way for consumers to know that the contents of a product match what is in the bottle and is not adulterated or contaminated. Additionally, NSF's worldwide inspection capabilities permit the evaluation of domestic and imported products.

In summary, the NSF dietary supplement certification program and the banned substance certification programs were designed to provide consumers, regulators, and retailers with reliable information to make informed purchasing decisions. We agree with the committee that there is much more work to do when it comes to addressing the safety of supplements and the education of consumers. We reach out to the consumers through our consumers affairs office, our Web site, online product listings, and our free consumer fact kits which are available on the back table.

As this committee continues to examine the issue of dietary supplement safety, NSF is ready to help. I would like to thank you, Mr. Chairman and the entire committee, for this opportunity to address this important issue today. I would be pleased to answer any questions that you may have.

[The prepared statement of Ms. Jordan follows:]

NSF International

Testimony of

Kathleen Jordan, MS, RD

General Manager, Dietary Supplement Certification Program

On Behalf of

NSF International

Before the

U. S. House of Representatives

Committee on Government Reform

Regarding

Regulation of Dietary Supplements

Washington, D.C.

March 9, 2006

789 N. Dixboro Road, Ann Arbor, Michigan 48105-9723 USA
1-800-NSF-MARK 734-769-8010
www.nsf.org

Welcome

Good afternoon Mr. Chairman and members of the Committee. I want to thank you for the opportunity to appear before you today to discuss NSF International's involvement in Dietary Supplements, Sports Nutrition Products and Functional Foods and the independent role we play in the evaluation and certification of these products.

About NSF

NSF was founded at the University of Michigan School of Public Health in 1944 to address the emerging need for national standardization of foodservice equipment and to provide product certification. NSF International is an independent, not-for-profit, 501(c)3 organization that develops national standards, and tests and certifies products that have the potential to impact public health, primarily through the food we eat and the water we drink. As part of its mission, NSF also provides education and training and conducts basic research at NSF International laboratories.

NSF standards development and product certification programs are fully accredited by the American National Standards Institute (ANSI), and NSF also has been designated as a World Health Organization Collaborating Centre for Food and Water Safety. NSF currently employs approximately 450 professionals, comprised of chemists, microbiologists, toxicologists, and food scientists.

About NSF Standards

NSF develops consensus standards according to the ANSI process, with the participation of federal agencies. NSF standards development follows OMB Circular A-119 requirements for federal agency participation in consensus standards and third-party certification. All NSF standards are reviewed and approved by an independent, external Council of Public Health Consultants, which is comprised of representatives from public health, academia and the regulatory communities with no ties to industry. Using this Council as the final oversight body in the standards development process assures that NSF standards remain protective of public health.

Product Certification

The product categories we test and certify include among many others, foodservice equipment, drinking water treatment chemicals and system components, water filters, bottled waters, plumbing products, and more recently, dietary supplements. Product certification at NSF is

based on formulation disclosure, review of potential health concerns by toxicologists, facility inspections, product sampling, product testing, and signing of a binding certification contract.

Dietary Supplement Standard NSF/ANSI 173

Using this same approach, NSF International worked with key stakeholders, including the Food and Drug Administration (FDA), to develop a U.S. national standard for Dietary Supplements, known as NSF/ANSI 173. The NSF certification program based on this standard allows consumers to identify compliant products and helps them make informed purchasing decisions. It should be noted that neither this standard nor the product certification address product efficacy in any way.

NSF/ANSI 173 covers manufacturing, packaging, and labeling of supplements. Companies seeking product certification against this Standard are involved in a five-step process:

1. An application is filed and certification contract signed.
2. Formulations and labels are evaluated by toxicologists for safety and accuracy.
3. Manufacturing facilities are audited against Section 8 of NSF/ANSI 173 for GMP compliance (based on the 1997 FDA Advance Notice of Proposed Rulemaking -ANPR).
4. Products are tested for identity, quantity and contaminants such as heavy metals, pesticides, mycotoxins, bacteria and adulterants.
5. Follow up product plant inspections and product testing are conducted annually.

As specified in NSF/ANSI 173, products and ingredients deemed a hazard to public health or safety by a regulatory agency having jurisdiction shall be excluded from certification.

The NFL/NFLPA Supplement Certification Program

Because of NSF's experience in dietary supplement certification, the National Football League (NFL) and the National Football League Players Association (NFLPA), requested NSF assistance in developing and administering the NFL/NFLPA Supplement Certification Program. In addition to meeting the requirements of NSF/ANSI 173, NSF tests each lot of product to ensure the absence of any substances banned by the NFL/NFLPA. We believe this program effectively addresses one aspect of the banned substances problem in sport.

The NSF Athletic Banned Substances Certification Program

NSF is now introducing its Athletic Banned Substances Certification Program. By building on the principles of the NFL program and the NSF dietary supplement certification expertise, we hope this new program will meet the growing demands from athletes and coaches, regulators, and

parents who are concerned about banned substances in sports supplements. Recently Major League Baseball and the MLB Players Association have expressed support for, and recommend, this new program. Through the NSF Athletic Banned Substances Certification Program, we stand ready to work with this committee, with manufacturers and with the sports community as a whole to create a level playing field for all professional, amateur and youth athletes who are dedicated to fair play in sports.

Proven Benefits

Once a product achieves certification, the product is required to bear the NSF Mark. When a consumer sees the NSF certification mark on a product, it sends a clear message that the contents of the product matches what's on the label and that it is not adulterated or contaminated. An additional benefit is that the NSF program is international in scope, and that its worldwide inspection capabilities permit the evaluation of domestic and imported products.

Summary

In summary, NSF was established to serve the public and help protect public health, and the NSF Dietary Supplement Certification Program was designed to provide consumers, regulators and manufacturers with reliable information to facilitate informed purchasing decisions. We agree with the committee that there is much more work to do when it comes to addressing the safety of supplements and the education of consumers. To fulfill our public health mission, we reach out to consumers through our consumers' affairs office and consumer web site and provide free consumer Fact Kits, free Listings and other educational materials.

As this House Committee continues to examine the issue of dietary supplement safety, NSF is ready to help. It's our goal to provide objective, reliable information about dietary supplements, and all categories of products we independently test and certify, so that purchase, use and regulation decisions can be based on reliable information.

Thank you to you Mr. Chairman and the entire committee for the opportunity to address this important issue today. I would be pleased to answer any questions that you may have.

Attachments

1. NSF Banned Substances Certification Process Flow Chart
2. NSF Dietary Supplements Website – Frequently Asked Questions
3. NSF Dietary Supplements Website – Sample Listings
4. Financial Disclosure of Federal Funding (2003-2005)
5. NSF/ANSI Standard 173: Dietary Supplements (separate)

NSF Banned Substances Certification Process Flow Chart

Certified for Sport™
www.nsf.org

THE NSF ATHLETIC BANNED SUBSTANCES CERTIFICATION PROGRAM

APPLICATION

- Formulation
- Label
- Ingredient suppliers information
- Manufacturing facilities information

TOXICOLOGY REVIEW

- Label and formulation review and comparison
- Ingredient review
- Determine product testing

FACILITY INSPECTION

- Good Manufacturing Practices (GMP) audits of production facilities
- Observations of in-house laboratories
- Sourcing and traceability procedures
- Schedule of ingredient supplier audits based on number of suppliers

ANNUAL LABORATORY TESTING/ANALYSIS

- Microbiological
- Heavy metals
- Pesticides/herbicides
- Label content verification
- Disintegration
- Banned substances testing based on number of lots

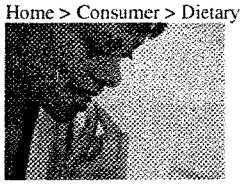
PRODUCT CERTIFICATION/LISTING

- Monitor control formulation/ingredient supplier changes
- Unannounced follow-up audits
- Marketplace sampling

NSF International
The Public Health and Safety Company™
789 N. Dixboro Road, Ann Arbor, MI 48105, 800-NSF-MARK, www.nsf.org

NSF Dietary Supplements Website – Frequently Asked Questions

Home > Consumer > Dietary Supplements



Dietary Supplements

Are you concerned about the contents of your vitamins, minerals, herbs, botanicals, protein bars or other supplements.? So are we.

In the last decade, the dietary supplements industry has grown tremendously. The fact that these products do not receive the same regulation as prescription or over-the-counter drugs raises questions in the minds of many consumers. That's why NSF became involved in developing the nation's first truly independent testing standard and product certification program strictly for dietary supplements.

Learn more about dietary supplements and the NSF certification program by selecting from the links below.

- Understanding Dietary Supplement Labels
- The Importance of Certification
- NSF Public Service Announcements: Dietary Supplements
- Additional Information and Links
- Frequently Asked Questions
- Search the NSF Listings
- Receive Email Updates
- Contact the NSF Consumer Affairs Office

Home > Consumer > Dietary Supplements

Frequently Asked Questions

Below are some of the common questions about dietary supplements that are received by the NSF Consumer Affairs Office. If you do not see your question listed, please contact our Consumer Specialist for assistance.

Should consumers check with a medical professional before using a dietary supplement?

Dietary supplements may not be totally risk-free under all circumstances, so consumers may want to check with a health-care provider prior to using a specific dietary supplement.

Some dietary supplement products can interact with certain prescription or over-the-counter medications. If you plan to use a dietary supplement in place of or in combination with a prescription or over-the-counter medication, you should discuss your intended use of the product with your health-care provider. Some supplements contain active ingredients that have strong biological effects and can cause adverse reactions in some users. Some supplements can also have unwanted effects during surgery, so it is important to remember to fully inform your doctor about the vitamins, minerals, herb, or any other supplements you are taking, especially before surgery.

What does NSF certification of a dietary supplement mean to consumers?

NSF International was one of the first organizations to develop an independent product evaluation program to address the rapidly growing dietary supplements industry.

The purpose of our voluntary program is to test and certify dietary supplements products to

- verify the identify and quantity of dietary ingredients listed on the product label;
- ensure the product does not contain undeclared ingredients or unacceptable levels of contaminants; and
- demonstrate conformance to currently recommended industry Good Manufacturing Practices (GMPs) for dietary supplements.

Consumers who purchase products that carry NSF certification can be assured that their dietary supplements meet the requirements of the most stringent product-testing program in place today.

What types of products are classified as dietary supplements?

A dietary supplement is defined as a product taken by mouth that contains a "dietary ingredient"

intended to supplement the diet.

Products meeting this definition include vitamins, minerals, herbs, botanicals, amino acids (the individual building blocks of protein) and concentrates, metabolites, constituents, and extracts of these substances. Dietary supplements are not classified as or considered to be drugs.

Who ensures the safety of dietary supplements?

By law, the manufacturer of the supplement is responsible for ensuring that its dietary supplement products are safe before they are marketed. The manufacturer is also responsible for determining that the claims shown on their product labels are accurate and truthful.

Unlike drug products that must be proven safe and effective for their intended use before marketing, dietary supplement products are not reviewed by the government before being made available to the consumer. However, the FDA can take action against any unsafe dietary supplement product that reaches the market. In addition, if the FDA is able to prove that claims being made for a dietary supplement product are either false or misleading, they can take action against such products as well.

Does the Federal Government regulate dietary supplements?

Congress established the Dietary Supplement Health and Education Act (DSHEA) in 1994 to create a regulatory framework to address the safety and labeling of dietary supplements. In contrast to prescription and over-the-counter drugs, dietary supplements covered by this act do not normally need approval from the FDA before they are marketed. However, for products introducing a new dietary ingredient, a pre-market review for safety data and other information is required.

Does the Federal Government also regulate advertising of dietary supplements?

The Federal Trade Commission regulates advertising (including infomercials) for dietary supplements and most other products sold to consumers. For more information on the FTC, you can visit their website at www.ftc.gov/bcp/menu-health.htm.

Advertising and promotional material received in the mail are subject to regulation by the U.S. Postal Inspection Service.

How does regulation of dietary supplements differ from prescription or over-the-counter drugs?

Dietary supplements are classified under the general category of food products, not drugs. Before marketing, drugs must undergo clinical studies to determine their effectiveness, safety, possible interactions with other substances, and appropriate dosages. The FDA will then review this data and determine whether to authorize use of the drugs.

The FDA does not test dietary supplements or authorize their use prior to these products being marketed.

What kinds of claims can be made on dietary supplement labels?

Products sold as a dietary supplements cannot claim to treat, prevent, or cure a specific disease or condition. By law, manufacturers may make three types of claims for their dietary supplement products:

1. **Health Claims**
   Disease or health claims show a link between a food or substance and a disease or health-related condition. Examples of these types of claims include:
   - Folic acid and a decreased risk of neural tube defect-affected pregnancy, if the supplement contains sufficient amounts of folic acid
   - Calcium and a lower risk of osteoporosis, if the supplement contains sufficient amounts of calcium
2. **Structure/Function Claims**
   Structure/function claims refer to the supplement's effect on the body's structure or function, including its overall effect on a person's well-being. Examples of structure/function claims include:
   - Calcium builds strong bones.
   - Antioxidants maintain cell integrity.

   Structure/function claims are easy to spot, because the product label must contain the disclaimer, "This statement has not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease."
3. **Nutrient Content Claims**
   Nutrient-content claims describe the level of a nutrient in a food or dietary supplement. For example, a supplement containing at least 200 milligrams of calcium per serving could carry the claim "high in calcium." A supplement with at least 12 mg per serving of vitamin C could state on its label, "Excellent source of vitamin C."

What type of information needs to be included on the label of a dietary supplement product?

According to the FDA and the Dietary Supplements and Education Act, the labels on dietary supplement products must contain the following information:

- Statement of identity
- Net quantity of contents
- Directions for use
- Supplement facts panel (listing the serving size, amount, and active ingredient)
- Other ingredients in descending order of predominance and by common name or proprietary blend.
- Name and place of business of manufacturer, packer, or distributor (this is the address to write for more product information).

If a structure/function claim is being made, the label must also include the disclaimer: "This statement has not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease."

Are manufacturers required to list all ingredients on the label of a dietary supplement?

All ingredients must be listed on the label. The main ingredient(s) are usually listed on the "Supplement

Facts" panel, while other ingredients are listed in the "other ingredient" statement beneath the panel. The types of ingredients listed in the "other ingredient" area would include the source of dietary ingredients, (i.e., rose hips as the source of vitamin C), other food ingredients (i.e., water), and any technical additives or processing aids (i.e., colors, preservatives, or flavors).

What can consumers do to protect themselves when purchasing dietary supplements?

Below are some suggestions consumers can follow to help protect themselves when it comes to dietary supplements.

- Look for products with the NSF Mark on the label. This Mark indicates that the product has been tested to ensure that the tablets contain the ingredients and quantities listed on the product label.
- Understand that products labeled "natural" do not guarantee that the products will be safe.
- Avoid products claiming on the label that the supplement is a new treatment or cure for a specific disease or condition. No companies are authorized under current federal regulations to make such claims for dietary supplement products. Consumers can report supplements making such claims to the FDA.

What can consumers do if they suspect they have become ill due to using a dietary supplement product?

If you suspect that you have suffered a harmful effect or illness that you think is related to use of a dietary supplement, you should call your health-care provider. He or she in turn can report it to FDA MedWatch by calling 1-800-FDA-1088 or going to www.fda.gov/medwatch/report/hcp.htm on the MedWatch website. Patients' names are kept confidential.

Consumers also may call the toll-free MedWatch number or go to www.fda.gov/medwatch/report/consumer/consumer.htm on the MedWatch website to report an adverse reaction. To file a report, consumers will be asked to provide:

- The name, address, and telephone number of the person who became ill.
- The name and address of the doctor or hospital providing medical treatment.
- A description of the problem.
- The name of the product and store where it was purchased.

Consumers also should report the problem to the manufacturer or distributor listed on the product's label and to the store where the product was bought.

Where can consumers obtain further information about a specific dietary supplement?

For further information regarding a specific dietary supplement, you can contact the manufacturer directly. Manufacturers and distributors of these supplements are required to include their name and address on the label of their products.

If you would like to find out if a particular product has been evaluated by NSF International, you can

refer to our dietary supplements online product database or contact our Consumer Affairs Office at 1-877-867-3435.

NSF Dietary Supplements Website – Sample Listings

NSF Product and Service Listings

These Listings were Last Updated on **Monday, March 06, 2006** at 4:15 AM Eastern Time. Please contact NSF International to confirm the status of any Listing, report errors, or make suggestions.

Warning: NSF is concerned about fraudulent downloading and manipulation of website text. If you have received this listing in hard copy, always confirm this certification/listing information by going directly to http://www.nsf.org/Certified/Dietary/Listings.asp? for the latest most accurate information.

NSF/ANSI Standard 173
Dietary Supplements

AMERIFIT NUTRITION, INC
166 HIGHLAND PARK DRIVE
BLOOMFIELD, CT 06002
800-990-3476

Facility : CALDWELL, NJ

Finished Products

Trade Designation	Product ID	Product Form	Manufacturer's Recommended Daily Serving Size
Vitamin/Mineral/Botanical			
Estroven	8563	Tablet	1 Tablet
Sootherbs Zinc Lozenges Wild Cherry	6950	Lozenge	6 to 8 Lozenges
Sootherbs Zinc Plus Echinacea & Vitamin C Honey Lemon	7794	Lozenge	6 to 8 Lozenges
Vitamin/Other			
FlexAble™ Glucosamine & Chondroitin Sugar-Free Chewables	8380	Tablet	2 Tablets
FlexAble™ Natural Glucosamine & Chondroitin Chewables	8379	Tablet	2 Tablets
Other			
FlexAble™ Glucosamine & Chondroitin All-Natural Orange Drink Mix	6872	Powder	1 Packet
FlexAble™ Glucosamine &	8378	Powder	1 Packet

Chondroitin Sugar-Free Orange Drink Mix		
Sootherbs Zinc Plus Echinacea 6950 & Vitamin C Cherry	Lozenge	6-8 Lozenges

[1] 2 tablets every four to six hours as needed. Do not exceed 6 tablets daily.
NOTE: NSF has tested and Certified that these products contain the identity and quantity of dietary ingredients declared on the product label and do not contain unacceptable quantities of unwanted contaminants.

CARDINAL DISTRIBUTION

7000 CARDINAL PLACE
DUBLIN, OH 43017
800-845-2745
614-757-7320

Facility : GREENVILLE, SC

Finished Products

Trade Designation	Product ID	Product Form	Manufacturer's Recommended Daily Serving Size
Amino Acid			
L-Lysine 500 mg	G687BC	Tablet	1 Tablet
Botanical			
Cranberry	G6A2AA	Caplet	6 Caplets
Echinacea	G2A2AB	Caplet	2 Caplets[2]
Echinacea Goldenseal	G1C6AC	Caplet	2 Caplets
Gingko Biloba 120 mg	G3F8AB	Caplet	1 Caplet
Panax Ginseng	G6C1AA	Caplet	2 Caplets[2]
St. John's Wort	G2F9AA	Caplet	3 Caplets

[2] Product is available at many retail supermarkets, drug stores, and mass merchandisers.

Mineral			
Ferrous Sulfate	G560AE	Tablet	1 Tablet[2]
Ferrous Sulfate Iron Tablets	G594AF	Tablet	1 Tablet
Magnesium	G808AC	Tablet	1 Tablet
Potassium 99 mg	G1J4AB	Caplet	1 Caplet
Zinc 50 mg	G2E3AA	Caplet	1 Caplet

[2] Product is available at many retail supermarkets, drug stores, and mass merchandisers.

Other			
Glucosamine Chondroitin	G6F2AC	Caplet	3 Caplets
Triple Strength Glucosamine Chondroitin	G5N1AA	Caplet	2 Caplets
Vitamin			
Chewable Vitamin C 500 mg	G8A2AD	Tablet	1 Tablet[2]

Chewable Vitamins Animal Shapes	G221AD	Tablet	1 Tablet
Folic Acid 400 mcg	G5C4AG	Tablet	1 Tablet
Multivitamin Essentials	G298AE	Tablet	1 Tablet
Natural Vitamin C with Rose Hips	G638DA	Tablet	1 Tablet
Natural Vitamin C with Rose Hips 500 mg	G8H1BA	Caplet	1 Caplet[2]
Stress Tablets	G283AC	Tablet	1 Tablet
Vitamin B-1 100 mg	G564AE	Tablet	1 Tablet
Vitamin B-100	G245AG	Tablet	1 Tablet
Vitamin B-12 100 mcg	G573AE	Tablet	1 Tablet
Vitamin B6	G592AH	Tablet	1 Tablet[2]
Vitamin C 1000 mg	G509CA	Tablet	1 Tablet
Vitamin C 250 mg	G505BE	Tablet	1 Tablet
Vitamin C 250 mg Chewable	G526AE	Tablet	1 Tablet
Vitamin C 500 mg	G6D3BA	Caplet	1 Caplet

[2] Product is available at many retail supermarkets, drug stores, and mass merchandisers.

Vitamin/Mineral

Animal Shapes Chewable Multivitamin with Iron	G249AD	Tablet	1 Tablet
Animal Shapes for Growing Kids Complete w/ Calcium, Iron & Minerals	G269AG	Tablet	1 Tablet[1]
Calcium Citrate	G5A2AD	Caplet	2 - 4 Caplets
Multivitamin Essentials with Iron	G210AF	Tablet	1 Tablet
Prenatal Multivitamin	G2N8AH	Tablet	1 Tablet
Stress Formula with Iron	G4A8AB	Tablet	1 Tablet
Stress Formula with Zinc	G225AD	Tablet	1 Tablet
Therapeutic-M Multivitamin Formula	G5J5AD	Caplet	1 Caplet
Women's Multivitamin	G246AK	Caplet	1 Caplet

[1] 1/2 tablet daily for children 2 - 4 years of age.

Vitamin/Mineral/Botanical

Century Advantage	G3L3AA+	Tablet	1 Tablet[2]

[2] Product is available at many retail supermarkets, drug stores, and mass merchandisers.

Vitamin/Mineral/Other

Antioxidant with Zinc	G2A3AD	Tablet	1 Tablet
Century Senior Multivitamin/Multimineral	G4A7AI	Tablet	1 Tablet
Men's Multiple Vitamins	G3C3AE+	Tablet	1 Tablet
Multivitamin Century	G6C2AI	Tablet	1 Tablet

EAS BY ROSS

DEPT. 103033 RP3-2
625 CLEVELAND AVENUE
COLUMBUS, OH 43215-1724
800-986-8510
614-624-3840

Facility : # 1 CANADA

Finished Products

Trade Designation	Product ID	Product Form	Manufacturer's Recommended Daily Serving Size
Vitamin/Mineral			
Myoplex® Advanced Protein Ready to Drink (Chocolate Fudge)	006125	Liquid	500 mL
Myoplex® Advanced Protein Ready to Drink (Vanilla)	006132	Liquid	500 mL

NOTE: NSF has tested and Certified that these products contain the identity and quantity of dietary ingredients declared on the product label and do not contain unacceptable quantities of unwanted contaminants.

NFL/NFLPA Supplement Certification Program

Trade Designation	Product ID	Product Form	Manufacturer's Recommended Daily Serving	Product Lot#
Vitamin/Mineral				
Myoplex® Advanced Protein Ready to Drink (Chocolate Fudge)	006125	Liquid	500 mL	333908 34017FH00 514708 L0414808 L0415008
Myoplex® Advanced Protein Ready to Drink (Vanilla)	006132	Liquid	500 mL	508208 L0334608 L0403008 L0421108 34018FH00

Facility : # 2 USA

Finished Products

Trade Designation	Product ID	Product Form	Manufacturer's Recommended

			Daily Serving Size
Vitamin/Mineral			
Cytovol® Fruit Punch	N/A	Powder	30 g
Cytovol® Tropical Orange	N/A	Powder	30 g

NOTE: NSF has tested and Certified that these products contain the identity and quantity of dietary ingredients declared on the product label and do not contain unacceptable quantities of unwanted contaminants.

Facility : # 6 USA

Finished Products

Trade Designation	Product ID	Product Form	Manufacturer's Recommended Daily Serving Size
Myoplex Deluxe Chocolate Peanut Butter	007085	Bar	54 g

NFL/NFLPA Supplement Certification Program

Trade Designation	Product ID	Product Form	Manufacturer's Recommended Daily Serving	Product Lot#
Myoplex Deluxe Chocolate Peanut Butter	007115	Bar	54 g	35242RV00

Facility : SPARTA, WI

Finished Products

Trade Designation	Product ID	Product Form	Manufacturer's Recommended Daily Serving Size
Vitamin/Mineral			
L-Glutamine	007290	Powder	5 g
Phosphagen HP™, Fruit Punch	000369	Powder	43 g
Precision Protein, Ready to Drink Beverage, Fruit Punch	006170	Liquid	20 oz.
Precision Protein, Ready to Drink Beverage, Grape	006163	Liquid	20 oz.

NOTE: NSF has tested and Certified that these products contain the identity and quantity of dietary ingredients declared on the product label and do not contain unacceptable quantities of unwanted contaminants.

NFL/NFLPA Supplement Certification Program

	Product	Manufacturer's	Product

Federal Funding Disclosure

NSF International

Schedule of Expenditures of Federal Awards
Year Ended December 31, 2003

Federal Agency/Pass-through Agency/ Program Title	CFDA Number	Pass-through Entity Project/Grant Number	Program Number	Award Amount	Federal Expenditures
Evironmental Protection Agency					
Research and Development Cluster:					
ETV Drinking Water Systems	66.500	R-828-333-01	395	$ 2,327,000	$ 862,531
Wet Weather Flows	66.500	R-825-712-01	399	3,580,760	78,221
Source Water Protection	66.500	CR-826-474-01	397	3,187,500	333,118
ETV Water Quality Protection	66.500	R-830-552-01	394	1,160,400	765,894
Onsite Wastewater Inspector Accreditation Program	66.463	CP-828-502-01	65	95,000	21,405
Decentralized Drinking Water System	66.606	X-829-523-01	393	150,000	70,154
Total federal awards					$ 2,131,323

See Note to Schedule of Expenditures of Federal Awards.

plante moran

NSF International and Subsidiary

Schedule of Expenditures of Federal Awards
Year Ended December 31, 2004

Federal Agency/Pass-through Agency/ Program Title	CFDA Number	Pass-through Entity Project/Grant Number	Program Number	Award Amount	Federal Expenditures
Evironmental Protection Agency -					
Research and Development Cluster:					
ETV Drinking Water Systems	66.500	R-82833301-04	395	$ 3,212,000	$ 785,969
Source Water Protection	66.500	CR-82647401-3	397	3,187,500	370,424
ETV Water Quality Protection	66.500	R-83055201-06	394	2,567,493	706,978
NSF International Center for Public Health Education	66.424	X6-83156501-0	641	15,000	15,000
Total expenditures of federal awards					$ 1,878,371

See Note to Schedule of Expenditures of Federal Awards.

NSF International
2005 Federal Revenue

Grant	CFDA #	Project/Grant #	Program #	Federal Expenditures
ETV Drinking Water Systems	66.500	R-82833301-04	395	477,592
Source Water Protection	66.500	CR-82647401-3	397	0
ETV Water Quality Protection	66.500	R-83055201-06	394	479,557
Department of Defense		S11560NS01	396	16,784
				973,933

16) /A16, 173 – 2005

Dietary supplements

NSF International Standard/ American National Standard

NSF/ANSI 173 – 2005

NSF International, an independent, not-for-profit, non-governmental organization, is dedicated to being the leading global provider of public health and safety-based risk management solutions while serving the interests of all stakeholders.

This Standard is subject to revision.
Contact NSF to confirm this revision is current.

Users of this Standard may request clarifications and interpretations, or propose revisions by contacting:

Chair, Joint Committee on Dietary Supplements
NSF International
789 North Dixboro Road, P.O. Box 130140
Ann Arbor, Michigan 48113-0140 USA
Phone: (734) 769-8010 Telex: 753215 NSF INTL
FAX: (734) 769-0109
E-mail: info@nsf.org
Web: http://www.nsf.org

1 6) /A1 6, 173 – 2005

NSF International Standard/
American National Standard
for Dietary Supplements —

Dietary supplements

Standard Developer
NSF International

Approved July 12, 2005
American National Standards Institute

Designated as an ANSI Standard
July 12, 2005
American National Standards Institute

Prepared by
The NSF Joint Committee on Dietary Supplements

Recommended for Adoption by
The NSF Council of Public Health Consultants

Adopted by
NSF International
January 2003

Revised July 2005

Published by

NSF International
PO Box 130140, Ann Arbor, Michigan 48113-0140, USA

For ordering copies or for making inquiries with regard to WKLV6WDQGDUG, SOHDVH UHIHUUHQFH WKH GHVLJQDWRQ "16) /A16, 173 – 2005."

Copyright 2005 NSF International
Previous editions @ 2003

Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from NSF International.

Printed in the United States of America.

Disclaimers[1]

NSF, in performing its functions in accordance with its objectives, does not assume or undertake to discharge any responsibility of the manufacturer or any other party. The opinions and findings of NSF represent its professional judgment. NSF shall not be responsible to anyone for the use of or reliance upon this Standard by anyone. NSF shall not incur any obligation or liability for damages, including consequential damages, arising out of or in connection with the use, interpretation of, or reliance upon this Standard.

NSF Standards provide basic criteria to promote sanitation and protection of the public health. Provisions for mechanical and electrical safety have not been included in this Standard because governmental agencies or other national standards-setting organizations provide safety requirements.

Participation in NSF Standards development activities by regulatory agency representatives (federal, local, state) shall not constitute their agency's endorsement of NSF or any of its Standards.

Preference is given to the use of performance criteria measurable by examination or testing in NSF Standards development when such performance criteria may reasonably be used in lieu of design, materials, or construction criteria.

The illustrations, if provided, are intended to assist in understanding their adjacent standard requirements. However, the illustrations may not include ***all*** requirements for a specific product or unit, nor do they show the only method of fabricating such arrangements. Such partial drawings shall not be used to justify improper or incomplete design and construction.

Unless otherwise referenced, the annexes are not considered an integral part of NSF Standards. The annexes are provided as general guidelines to the manufacturer, regulatory agency, user, or certifying organization.

[1] The information contained in this Disclaimer is not part of this American National Standard (ANS) and has not been SUR¶HVHG IQ DFFRUGDQFH ZLWK A1 6,'V UHTXLUH HQW IRUDQ A1 S. As such, this Disclaimer may contain material that has not been subjected to public review or a consensus process. In addition, it does not contain requirements necessary for conformance to the Standard.

This page is intentionally blank.

Contents

Foreword vii

1 General 1
  1.1 Purpose 1
  1.2 Scope 1

2 Normative references 1

3 Definitions 4

4 Labeling and literature requirements 6

5 3URGXFWVWHTXLUHP HQWV – YHULIIed by testing laboratories 6
  5.1 Identity 6
  5.2 Quantity 7
  5.3 Contaminants 7
  5.4 Disintegration 8
  5.5 Oils 9

6 Test methods used by testing laboratories for identification and quantification of ingredients 9
  6.1 Identification test methods 9
  6.2 Quantification test methods 10

7 Test methods used by testing laboratories for detection of contaminants 11
  7.1 Test methods for metals 11
  7.2 Pesticides 12
  7.3 Test methods for microbiological contaminants 12
  7.4 Test methods for chemical contaminants 13

8 Good Manufacturing Practices 13
  8.1 Personnel 14
  8.2 Plant and grounds 15
  8.3 Sanitation of buildings and facilities 15
  8.4 Equipment and utensils 17
  8.5 Quality assurance/control and laboratory operations 18
  8.6 Production and process controls 20
  8.7 Warehousing, distribution, and post-distribution processes 23
  8.8 Files for substantiation of health claims and statements of nutritional support 24
  7DEOH 1 – 7HVWP HWKRGV IRr dietary ingredients 26
  7DEOH 2 – 7HVWP HWKRGV IRUP Drker constituent compounds 28
  7DEOH 3 – AFFHSWDEOH OP LW IRUP LFUREIRBJLFDOcontaminants in botanical raw materials 30
  7DEOH 4 – AFFHSWDEOH OP LW IRUP LFUREIRBJLFal contaminants in finished product 31

Annexes
A Botanicals known or suspected to contain aristolochic acid A1

B Reference information for contaminant level acceptance criteria B1
  B.1 Metals B1
  B.2 Microbiological contaminants B2

C Calculating acceptance criteria C1
  C.1 Normalization of laboratory data C1
  C.2 Sampling and reporting of laboratory data C1
  C.3 Normalization calculations C1

This page is intentionally blank.

Foreword[2]

The purpose of NSF/ANSI 173 is to serve as an evaluation tool for analyzing dietary supplements. Certification to this Standard serves as a communication tool between manufacturers of ingredients and finished product, retailers, healthcare practitioners, and consumers. This Standard provides test methods and evaluation criteria to allow for the determination that a dietary supplement contains the ingredients claimed on the label, either qualitatively or quantitatively, and that it does not contain specific undeclared contaminants. In some instances, validated laboratory methods are not yet available for analyzing certain ingredients. In such cases, new methods will be added to this Standard as they become available.

NSF/ANSI 173 was developed with participation from the dietary supplements industry, public health regulators, and distributors of dietary supplements. Participation and technical guidance was provided by representatives of the American Herbal Products Association, the American Pharmaceutical Association, the Consumer Healthcare Products Association, the Council for Responsible Nutrition, the National Institutes of Health, and the National Nutritional Foods Association.

Section 8 contains requirements for Good Manufacturing Practices (GMPs) based on the GMPs submitted by industry to the U.S. Food and Drug Administration (USFDA) in November 1995.[3] When the USFDA publishes Good Manufacturing Practices, this document will be revised to be consistent with the 86) ' A'V G0 3V.) XUWHUFDOLLFDWRQ WH LQWLSUHWDWLRQ of these GMPs for certification to this Standard may be found in NSF's Certification Policies for Dietary Supplements.

7KLV HGLWRQ RI WKH 6WDQGDUG (16) /A16, 173 – 2005) LQFRUSRUDWHV WKH IROORZLQJ UHYLVLRQV:

- 6HFWLRQ 2, 1RUP DWLYH UHIHUHQFHV, LQFRUSRUDWH editorial changes and updates to current referenced documents as well as additional references.

- AGGLWLRQDOOQ XDJH DQG UHTXLUHP HQWV KDYH EHHQ LQFRUSRUDWHG LQWR VHFWLRQ 5, 5DZ 0DWHULDOV, WR include product requirements and evaluation associated with the types of common claims.

- AQ LGHQWLILFDWLRQ DQG TXDQWLWDWLYH TXDOLWY DVVXrance section has been added to section 6.

- A P RGLILFDWLRQ DQG DGGLWLRQDOOQ XDJH KDV EHHQ LQFRUSRUDWHG LQWR VHFWLRQV 6 DQG 7 WR VXSSRUW compliance with method validation requirements within the context of analysis for dietary supplements.

- A P RGLILFDWLRQ WR WKH OQJXDJH LQ VHFWLRQ 7.1, 7HVWP HWKRGV IRU P HWDOV, WR P RUH DFFXUDWHO reflect the evaluation(s) performed to measure contaminant levels of chromium (VI).

- ,QFRUSRUDWH SHQDOWLHV UHODWHG WR WKH WDE0H LQ 7.2.2.

- 6HFWLRQ 9, 5HFRUGV UHWHQWLRQ KDV EHHQ UHRUP DWWG WR EH LQFRUGHG DV D GRRG 0DQXIDFWXULQJ Practice and clarification of necessary label storage.

- AGGLWLRQDOOQ XDJH KDV EHHQ DGGHG WR VHFWLRQV 5 DQG 7 WR VHWWP LW IRUSHUI LGH XVHG LQ GLHWDU supplements oils.

---

[2] The information contained in this Foreword is not part of this American National Standard (ANS) and has not been SUHVHQWHG LQ DFFRUGDQFH ZLWK A16,'V UHTXLUHP HQWV IRUDQ A16. As such, this Foreword may contain material that has not been subjected to public review or a consensus process. In addition, it does not contain requirements necessary for conformance to the Standard.

[3] Federal Register, February 6, 1997 (Volume 62, Number 25), Docket No. 96 N-0417, 5699-5709

NSF offers a certification program to this Standard. Products certified by NSF carry the NSF Mark, the leading mark in public health and safety certification around the world. The NSF Mark on a product gives consumers and retailers assurance that the product meets the requirements of the NSF Standard. For more information on the NSF certification program, please contact Kathy Pompliano at NSF International, P.O. Box 130140, Ann Arbor, MichiJDQ48113–0140 RUDWI-734-769-8010.

Suggestions for improvement of this Standard are welcome. Comments should be sent to Chair, Dietary Supplements, c/o NSF International, Standards Department, P.O. Box 130140, Ann Arbor, Michigan, 48113-0140, USA.

© 2005 1 6) 1 6) /A1 6, 173 – 2005

NSF International Standard
for Dietary Supplements —

Dietary supplements

1 General

1.1 Purpose

This Standard provides test methods and evaluation criteria for dietary supplement products to allow for the determination that the ingredients in the product are accurately identified and that the product contains the quantity of dietary ingredients and marker constituents declared on the product label and that the product does not contain unacceptable quantities of contaminants.

This Standard also provides criteria for determining that Good Manufacturing Practices were adhered to in the production of dietary supplements.

1.2 Scope

This Standard contains requirements for dietary supplements that bear or contain one or more of the following dietary ingredients: a vitamin, a mineral, a herb or other botanical, an amino acid, a dietary substance for use by man to supplement the diet by increasing the total dietary intake; or a concentrate, metabolite, constituent, extract, or combinations of these ingredients. This Standard does not include products represented for use as conventional foods.

Products and ingredients deemed a hazard to public health or safety by a regulatory agency having jurisdiction shall be excluded from the scope of this document. Conventional foods shall be excluded from the requirements of this Standard.

2 Normative references

The following documents contain provisions that, through reference in this text, constitute provisions of this Standard. At the time this Standard was written, the edition indicated was valid. All documents are subject to revision, and parties are encouraged to investigate the possibility of applying the most recent edition of the document indicated below.

AHP, American Herbal Pharmacopoeia and Therapeutic Compendium, *Ashwagandha Root*, April 2000[4]

AHP, American Herbal Pharmacopoeia and Therapeutic Compendium, *Astragalus Root*, August 1999[4]

AHP, American Herbal Pharmacopoeia and Therapeutic Compendium, *Bilberry fruit*, 2001[4]

AHP, American Herbal Pharmacopoeia and Therapeutic Compendium, *Black Cohash root*, 2002[4]

AHP, American Herbal Pharmacopoeia and Therapeutic Compendium, *Black Haw Bark*, June 2000[4]

AHP, American Herbal Pharmacopoeia and Therapeutic Compendium, *Chaste Tree Fruit*, 2001[4]

[4] American Herbal Pharmacopoeia, PO Box 66809, Scotts Valley, CA 95067

AHP, American Herbal Pharmacopoeia and Therapeutic Compendium, *Cramp Bark*, February 2000[4]

AHP, American Herbal Pharmacopoeia and Therapeutic Compendium, *Cranberry*, 2002[4]

AHP, American Herbal; Pharmacopoeia and Therapeutic Compendium, *Dang Gui Root*, 2003[4]

AHP, American Herbal Pharmacopoeia and Therapeutic Compendium, *Ginkgo Leaf*, 2003[4]

AHP, American Herbal Pharmacopoeia and Therapeutic Compendium, *Goldenseal*, 2001[4]

AHP, American Herbal Pharmacopoeia and Therapeutic Compendium, *Hawthorn Berry*, June 1999[4]

AHP, American Herbal Pharmacopoeia and Therapeutic Compendium, *Hawthorn Leaf with Flower*, February 1999[4]

AHP, American Herbal Pharmacopoeia and Therapeutic Compendium, *Reishi Mushroom*, September 2000[4]

AHP, American Herbal Pharmacopoeia and Therapeutic Compendium, *SW-RKQV: RUW*July 1997[4]

AHP, American Herbal Pharmacopoeia and Therapeutic Compendium, *Schisandra Berry*, October 1999[4]

AHP, American Herbal Pharmacopoeia and Therapeutic Compendium, *Valerian Root*, April 1999[4]

AHP, American Herbal Pharmacopoeia and Therapeutic Compendium, *Willow Bark*, December 1999[4]

AHPA, American Herbal Products Association, *Herbs of Commerce*, 2nd Edition, 2000[5]

AOAC International, Food and Drug Administration, *Bacteriological Analytical Manual*, eighth edition (1998)[6]

AOAC International, *Official Methods of Analysis*, 17th ed.[6]

AOCS, American Oil Chemists Society International, *Sampling and Analysis of Commerical Fats and Oils*, Cd 18-90 (1997)[7]

BHP, British Herbal Medicine Association, *British Herbal Pharmacopoeia*, 1996[8]

Code of Federal Regulations, Title 40, (40 CFR) Part 141, *National Primary Drinking Water Regulations*[9]

Dietary Supplements Health and Education Act of 1994, (an amendment to the Federal Food, Drug and &RVP HUT AFW 3 XEOF / DZ 103-417 – 2 FWEHU25, 1994[10]

---

[5] American Herbal Products Association, 8484 Georgia Ave., Suite 370, Silver Spring, MD 20910

[6] AOAC International, 481 Frederick Avenue, Suite 500, Gaithersburg, MD 20877

[7] AOCS, 2211 W. Bradley Ave., Champaign, IL 61821

[8] British Herbal Medicine Association, P.O. Box 304, Bournemouth, Dorset, BH7 6JZ, England

[9] U.S. Government Printing Office, Washington, DC 20402

[10] Superintendent of Documents, U.S. Government Printing Office, Washington, DC

INA, *Allicin by High-Performance Liquid Chromatography*[11]

INA, *Black Cohosh Assay by ELSD*[11]

INA, *Catechins and Gallic Acid in Green Tea by HPLC*[11]

INA, *Fatty Acid Content in Saw Palmetto by Gas Chromatography*[11]

INA, *Ginkgo Flavonol Glycoside Assay by HPLC*[11]

INA, *Ginkgoterpenoid Assay by HPLC*[11]

INA, *Kavalactone Assay by HPLC*[11]

INA, *Phenolics in Echinacea by HPLC*[11]

INA, *SW-RKQV: RUWA WDy Ey HPLC*[11]

INA, *Sterols Content in Saw Palmetto by Gas Chromatography*[11]

International Code for Botanical Nomenclature (St. Louis Code), 2000[12]

NTIS/IEC 17025: 1999 *General requirements for the competence of testing and calibration laboratories*[13]

The Merck Index: *An Encyclopedia of Chemicals, Drugs and Biologicals* (Annual) [14]

NSF International White Book of NSF Registered and USDA Authorized Proprietary Substances and Nonfood Compounds[15]

Public Health Security and Bioterrorism Preparedness and Response Act of 2002, 42 USC 201[9]

USEPA *0 HWRGV IRU WH DHMUP LQDWRQ RI 0 HWDOV LQ EQvLURQP HQWDO SDP SOHV – SuSSOHP HQW* 1 – (3A/600/5-94-111 – 0 Dy 1994[16]

USEPA *Microwave Assisted Acid Digestion of Sediments, Sludges, Soils and Oils*, EPA Method 3510-September 1994[16]

USEPA *National Primary Drinking Water Regulations* (40 CFR part 141) [16]

USFDA, *Bacteriological Analytical Manual,* eighth edition, 2001[16]

---

[11] Institute for Nutraceutical Advancement (INA), c/o NSF International, 789 Dixboro Road, Ann Arbor, MI 48105

[12] Sixteenth International Botanical Congress, St. Louis, Missouri, July-August 1999. Publ. 2000, Koeltz Scientific Books.

[13] National Technical Information Service, 5285 Port Royal Rd., Springfield, VA 22161

[14] Merck & Company, Whitehouse Station, NJ

[15] NSF International, 789 North Dixboro Road, Ann Arbor, MI 48105

[16] USEPA, Office of Water, Washington, DC 20460

USFDA, *Pesticide Analytical Manual,* Volume 1. Multiresidue Methods [Base Manual 3rd (GLVRQ@J 994 – NTIS report number PB9294911899[17]

USFDA, *Pesticide Analytical Manual,* 9RXP H 1 8 SGDWV. ,UHJXODUUHSRUWV 2003 – 1 7,6 UHSRUWXXP EHU PB2003911800[17]

USFDA, *Pesticide Analytical Manual,* 9RXP H 2. 0 HWKRGV IRU,QGLYLGXDO5 HVLGXHV >%DVH 0 DQXDO@– 1991 NTIS report number PB92911999[17]

USFDA, *Food Code 2001 Recommendations of the United States Public Health Service Food and Drug Administration,* NTIS report number PB2002100819[17]

USFDA, *Determination of Aristolochic Acid in Traditional Chinese Medicines and Dietary Supplements*[18]

USP, United States Pharmacopeia, USP 28-NF 23,[19]

WHO, *World Health Organization Monographs on Selected Medicinal Plants*, Volume 1[20]

WHO, *Guidelines for Drinking-Water Quality*[20]

3 Definitions

Terms used in this Standard that have special technical meaning are defined here.

3.1 active ingredient: Principal ingredient identified in product name or on the principal display panel.

3.2 adulteration: As defined by the Federal Food and Cosmetic Act, §402, adulterated food is defined in Title 21, USC §342.

3.3 batch or lot: A specific quantity of a finished product or other material that is intended to have uniform character and quality, within specified limits, and/or is produced according to a single manufacturing order during the same cycle of manufacture.

3.4 botanical ingredient: An ingredient of plant species or form.

3.5 chewable: A supplement intended to be reduced through mastication.

3.6 Class I: added nutrients.

3.7 Class II: naturally occurring (indigenous) nutrients.

3.8 dietary ingredient: An ingredient intended for use or used in a dietary supplement that is a vitamin, a mineral, an herb or other botanical, an amino acid, a dietary substance for use by man to supplement the diet by increasing the total dietary intake, or a concentrate, metabolite, constituent, or extract.

3.9 dietary supplement[14]**:** A product (other than tobacco) that:

---

[17] U.S. Department of Health and Human Services, Public Health Service, Food and Drug Administration, 5600 Fishers Lane, Rockville, MD 20857-0001

[18] USFDA Forensic Chemistry Center, Cincinnati, OH

[19] United States Pharmocopeia, 121601 Twinbrook Parkway, Rockville, MD 20852-1790

[20] World Health Organization, 1211 Geneva 27, Switzerland

– IV LQWQGHG WR VXSSOHP HQWDWH GLHWDWDOHDOV RU contains one or more of the following dietary ingredients: a vitamin, a mineral, a herb or other botanical, an amino acid, a dietary substance for use by man to supplement the diet by increasing the total dietary intake; or a concentrate, metabolite, constituent, extract, or combinations of these ingredients;

– IV LQWQGHG IRU LQJHVWLRQ in pill, capsule, tablet, powder, or liquid form;

– IV QRW WHSUHVHQWHG IRU XVH DV D FRQYHQWLRQDO food or as the sole item of a meal or diet;

– IV OHEHOHG DV D "GLHWDU\ VXSSOHP HQW"

– LQFOXGHV DQ DUWLFOH WKDW DSSURYHG DV D QHZ drug under section 505, certified as an antibiotic under section 507, or licensed as a biologic under section 351, of the Public Health Service Act (42 U.S.C. 262), and was, prior to such approval, certification, or license, marketed as a dietary supplement or as a food unless the Secretary has issued a regulation, after notice, and comment, finding that the article, when used as or in a dietary supplement under the conditions of use and dosages set forth in the labeling for such dietary supplement, is unlawful under section 402(f), and does not include an article that is approved as a new drug under section 505, certified as an antibiotic under section 507, or licensed as a biologic under section 351 of the Public Health Service Act (42 U.S.C. 262) or an article authorized for investigation as a new drug, antibiotic, or biological for which substantial clinical investigations have been instituted and for which the existence of such investigations has been made public, which was not before such approval, certification, licensing, or authorization marketed as a dietary supplement or as D IRRG XQGHU VXH 6 HFUHWDU\, LQ VXH 6 HFUHWDU\'V discretion, has issued a regulation, after notice and comment, finding that the article would be lawful.

3.10 finished product: A product requiring no further processing prior to sale to the consumer.

3.11 Good Manufacturing Practices (GMP): A system of procedures and documentation, written or analytical, to assure the product produced has the identity, strength, composition, quality, and purity that it purports or is represented to possess.

3.12 in-process material: Any material fabricated, compounded, blended, ground, extracted, sifted, sterilized, derived by chemical reaction, or processed in any other way that is produced for, and used in, the preparation of a dietary ingredient or supplement prior to packaging as ready for sale.

3.13 lot number: Any distinctive combination of letters, numbers, or symbols, or any combination of them from which the complete history of the manufacture, processing, packaging, holding, and distribution of a batch or lot of a finished dietary ingredient, dietary supplement, or other material can be determined.

3.14 manufacture or manufacturing: All operations associated with the production of dietary supplements, including packaging, labeling, testing, and quality control of a dietary ingredient or dietary supplement.

3.15 marker constituent: A compound present in a botanical that is characteristic of the botanical and that is used for technical purposes and allows for the quantification of the ingredients incorporated into the product, e.g., identification of the botanical or process control.

3.16 measure of uncertainty: An estimation of the variability in an analytical result that can be reasonably expected based on the methodology employed. The estimate is based in part on parameters such as reproducibility, reference materials, and sample effects including matrix spike recoveries and scientific experience.

3.17 plant: Building or facility or parts thereof, used for or in connection with the manufacturing, packaging, labeling, or holding of a dietary product.

3.18 pest: Any objectionable animal or insect including, but not limited to, birds, rodents, insects, and larvae.

3.19 quality control system: A planned systematic procedure for taking all actions necessary to produce consistent, unadulterated dietary ingredients or dietary supplements.

3.20 quality control unit: Any person or organizational element designated by the firm to be responsible for the duties relating to quality control operations.

3.21 raw material: Any ingredient intended for use in the manufacture of a dietary ingredient or dietary supplement, including those that may not appear in such finished product.

3.22 representative sample: A sample that consists of a number of units that are drawn based upon rational criteria, such as random sampling, and is intended to assure that the sample accurately portrays the material being sampled.

3.23 rework: Clean, unadulterated material that has been removed from processing for reasons other than unsanitary conditions, or that has been successfully reconditioned by reprocessing, and that is suitable for use in the manufacture of a dietary product.

3.24 specifications: The quality parameters to which the products or materials shall conform and which serve as a basis for quality evaluation.

4 Labeling and literature requirements

Product labels shall declare the identity of dietary ingredient(s) and/or marker constituent(s) included in the product. Labels of products other than proprietary blends shall declare the quantity of each dietary ingredient(s) and/or marker constituent(s), which shall be labeled by common name according to Merck Index or in accordance with the appropriate regulatory agency guidance when available. Products containing botanicals shall include the part of plant from which the ingredients are derived. Common names of botanicals shall be in accordance with Herbs of Commerce or the International Code of Botanical Nomenclature. The amount of active or desired ingredient shall be listed in addition to the total amount of the ingredient. Product literature may also include this information. Labels shall comply with appropriate regulatory requirements.

5 3URGuFWLHTuLLHP HQW – YHUULLHG Ey WWWQJ CDERUDWRULHV

All dietary supplements shall meet all applicable regulatory requirements.

5.1 Identity

5.1.1 Raw materials

The identity of the raw material shall be verified in accordance with 6.1 and/or 8 using those test method(s) appropriate for establishing iGHQWLW EDVHG RQ WKH P DQXIDFWXUHUV FODLP V.

5.1.2 Finished product

All finished products shall contain each of the dietary ingredients and/or marker constituents declared on the label when tested in accordance with 6.1. The source of the ingredient shall be verified as listed on the label.

5.2 Quantity

5.2.1 Raw materials

The quantity of marker constituents shall be verified in accordance with 6.2 when declared on the certificate of analysis. Other declarations made in the Certificate of Analysis and/or the Raw Material Specification shall be verified in accordance with 6.2, 7.4 and/or 8.

5.2.2 Finished products

The quantity of dietary ingredients and/or marker constituents declared on the label shall be verified in accordance with 6.2 and/or 8. Nutritional declarations will be verified in accordance with 6.2 only when the quantity claimed is greater than 2% of the daily recommended value (DRV) (based on the reference caloric intake of 2,000 calories) as detailed in the following table (Ref. is 21 CFR 101.9).

Component	DRV (units)	Level requiring testing
cholesterol	300 g	> 6 g/serving
fat	65 g	> 1.3 g/serving
fiber	25 g	> 0.5 g/serving
potassium	3,500 mg	> 70 mg/serving
protein	50 g	> 1 g/serving
saturated fatty acids	20 g	> 0.4 g/serving
sodium	2,400 mg	> 48 mg/serving
total carbohydrate sugar	300 g	> 6 g/serving

The product shall contain at least 100% (minus the measure of uncertainty) of the quantity of each Class I dietary ingredient and/or marker constituent declared on the label.

The product shall contain at least 80% (minus the measure of uncertainty) of the quantity of each Class II dietary ingredient and/or marker constituent declared on the label. The product shall not contain quantities in excess of those permitted by G0 3 (P DQXI DFXUHJ VSHFLILFDWRQ).

5.3 Contaminants

5.3.1 Metals

5.3.1.1 Raw materials

Raw materials shall not contain undeclared metals in amounts greater than the following:

- DUVHQLF FRQWDPLQDWLRQ[FHHG 5 SDUW SHUP LOOLRQ (SSP);
- FDGP LXP FRQWDPLQDWLRQ[FHHG 0.3 SSP ;
- FKURP LXP (9,) FRQWDPLQDWLRQ[FHHG 2 SSP ;
- PHUFXU\ FRQWDPLQDWLRQ[FHHG 10 SSP ; DQG
- P HUFXU\ FRQWDPLQDWLRQ[FHHG 0.2 SSP .

5.3.1.2 Finished products

Finished products shall not contain undeclared metals at rates of intake greater than the following:

- DUVHQLF FRQWDPLQDWLRQ[FHHG 0.01 milligrams per daily dose (mg/d);
- FDGP LXP FRQWDPLQDWLRQ[FHHG 0.006 P J/G
- FKURP LXP (9,) FRQWDPLQDWLRQ[FHHG 0.02 P J/G
- PHUFXU\ FRQWDPLQDWLRQ[FHHG 0.02 P J/G DQG
- P HUFXU\ FRQWDPLQDWLRQ[FHHG 0.02 P J/G

5.3.2 Pesticides

Unless manufacturers have controls in place to screen for pesticides or use certified organic ingredients as demonstrated in the GMP audit, a broad pesticide screen shall be performed to confirm compliance with USFDA and USEPA regulated limits and the absence of banned pesticides in botanical products.

Raw materials and finished products containing *Panax ginseng* or *Panax quinquefolius* shall not contain pesticides listed in section 7.2.2 (limit of detection < 10 ppb).

5.3.3 Microbiological contaminants

Raw materials shall not contain aflatoxins at levels > 20 ppb and shall not contain microorganisms in quantities greater than permitted in table 3.

Finished products shall not contain aflatoxins at levels > 20 ppb and shall not contain microorganisms in quantities greater than permitted in table 4.

Finished products in a liquid form with an alcohol content ≤ 50% shall not contain *Pseudomonas aeruginosa*.

Finished products with an alcohol content ≥ 50% are exempt from microbial testing.

5.3.4 Natural toxins

Botanicals listed in annex A shall not contain aristolochic acid (limit of detection = 0.5 μg/gm).

5.3.5 Known adulterants

Products shall be evaluated to ensure they do not contain known adulterants including, but not limited to, the following:

- *E*[illegible] shall not contain *Periploca sepium* root.
- *P*[illegible] shall not contain *Digitalis lanata* leaf.
- *S*[illegible] shall not contain *Teucrium chamaedrys*.
- *S*[illegible] shall not contain *Aristolochia fangchi*.

5.3.6 Other product claims

Claims that the product is free of a particular contaminant or substance shall be verified in accordance with 7.4 and/or 8.

5.4 Disintegration

Supplements shall be verified as meeting the requirements for disintegration when tested using the methods described in USP 25-NF 20. The minimum exposure time to immersion fluids shall not be less than 60 min. Chewables and liquid extracts are exempt from disintegration testing requirements.

5.5 Oils

Supplements containing oils at greater than 2% by weight of the formulation shall demonstrate non-rancidity of the ingredients by having a Peroxide Value (PV) of less than 10 milliequivalents/Kg oil, a p-Anisidine Value (p-AV) of less than 20 and a Total Oxydation (Totox) Number (p-AV + 2PV) of less than 26.

© 2005 1 6)

6 Test methods used by testing laboratories for identification and quantification RI LQJ UHGLHQW – UDw P DWrials and finished products

6.1 Identification test methods

6.1.1 Botanicals

6.1.1.1 Macroscopic test methods

The identity of products shall be evaluated by an appropriate qualified individual based on the information contained in the monographs listed in table 1.

6.1.1.2 Microscopic test methods

The identity of products shall be evaluated by an appropriate qualified individual based on the information contained in the monographs listed in table 1.

6.1.1.3 Chemical test methods

The identity of dietary ingredients shall be evaluated in accordance with the methods in table 1. If no method exists or if improved technology allows for a more accurate and precise method to be developed, one may be developed. The use of any new method shall require that a validation be performed, following the principles of the AOAC Single Lab Validation Guideline as a minimum, which includes an evaluation of specificity and reproducibility. More rigorous validation could follow according to the guidelines of ICH, FDA, GLP, CEN, AOAC, as appropriate.

6.1.2 Vitamins

The identity of vitamins shall be evaluated in accordance with the methods listed in the current year of USP and NF. If no method exists or if improved technology allows for a more accurate and precise method to be developed, one may be developed. The use of any new method shall require that a validation be performed, following the principles of the AOAC Single Lab Validation Guideline as a minimum, which includes an evaluation of specificity and reproducibility. More rigorous validation could follow according to the guidelines of ICH, FDA, GLP, CEN, AOAC, as appropriate.

6.1.3 Minerals

The identity of minerals shall be evaluated in accordance with the methods listed in the USP-NF. If no method exists or if improved technology allows for a more accurate and precise method to be developed, one may be developed. The use of any new method shall require that a validation be performed, following the principles of the AOAC Single Lab Validation Guideline as a minimum, which includes an evaluation of specificity and reproducibility. More rigorous validation could follow according to the guidelines of ICH, FDA, GLP, CEN, AOAC, as appropriate.

6.1.4 Other dietary supplement ingredients

An effort shall be made to seek out the most appropriate method to confirm claims for the product under evaluation. The source of these methods may include AOAC International, USP-NF, AHP, European, German, Japanese monographs, INA, etc. The use of any new method shall require that a validation be performed, following the principles of the AOAC Single Lab Validation Guideline as a minimum, which includes an evaluation of specificity and reproducibility. More rigorous validation could follow according to the guidelines of ICH, FDA, GLP, CEN, AOAC, as appropriate.

6.1.5 Quality assurance for identification test methods

Identification test methods shall be performed using certified reference standards or materials when available. These shall include vouchered specimens, certified reference materials, and/or single chemicals with established identity. To the extent to which it is feasible, the reference standard or material shall be prepared in the same manner as the sample being evaluated.

6.2 Quantification test methods

6.2.1 Botanicals

If declared on the label, the identity of marker constituents shall be evaluated in accordance with the methods in table 2. If no method exists or if improved technology allows for a more accurate and precise method to be developed, one may be developed. The use of any new method shall require that a validation be performed, following the principles of the AOAC Single Lab Validation Guideline as a minimum, which includes an evaluation of specificity, linearity, reproducibility, accuracy, spike recovery and method detection limit (if applicable). More rigorous validation could follow according to the guidelines of ICH, FDA, GLP, CEN, AOAC, as appropriate.

6.2.2 Vitamins

The quantity of vitamins shall be evaluated in accordance with the methods listed in the USP-NF. If no method exists or if improved technology allows for a more accurate and precise method to be developed, one may be developed. The use of any new method shall require that a validation be performed, following the principles of the AOAC Single Lab Validation Guideline as a minimum, which includes an evaluation of specificity, linearity, reproducibility, accuracy, spike recovery and method detection limit (if applicable). More rigorous validation could follow according to the guidelines of ICH, FDA, GLP, CEN, AOAC, as appropriate.

6.2.3 Minerals

The quantity of minerals shall be evaluated in accordance with the methods listed in the USP-NF. If no method exists or if improved technology allows for a more accurate and precise method to be developed, one may be developed. The use of any new method shall require that a validation be performed, following the principles of the AOAC Single Lab Validation Guideline as a minimum, which includes an evaluation of specificity, linearity, reproducibility, accuracy, spike recovery and method detection limit (if applicable). More rigorous validation could follow according to the guidelines of ICH, FDA, GLP, CEN, AOAC, as appropriate.

6.2.4 Other dietary supplement ingredients

An effort shall be made to seek out the most appropriate method to confirm claims for the product under evaluation. The source of these methods may include AOAC International, USP-NF, AHP, European, German, Japanese monographs, INA, etc. The use of any new method shall require that a validation be performed, following the principles of the AOAC Single Lab Validation Guideline as a minimum, which includes an evaluation of specificity, linearity, reproducibility, accuracy, spike recovery and method detection limit (if applicable). More rigorous validation could follow according to the guidelines of ICH, FDA, GLP, CEN, AOAC, as appropriate.

6.2.5 Quality assurance for quantitative test methods

6.2.5.1 Calibration

Quantification test methods shall be performed using certified reference standards as calibration standards. The standards are typically purchased as single chemicals with greater than 95% purity. If a high purity standard is not available, a lower purity material shall be used if there is a means by which the actual purity can be measured (i.e. uv absorbance, etc).

6.2.5.1.1 Multi-level calibration curves

Multi-level calibration curves shall be prepared with a minimum of 3 concentration levels such that any sample preparations under evaluation would be bracketed by a calibration standard. Curves shall give a correlation coefficient of 0.995 or higher.

6.2.5.1.2 Single-level calibration curves

If a single level calibration is employed, the standard shall be run in triplicate and the relative standard deviation between these runs shall not exceed 2%. The detector response of the prepared sample shall be within 90% -%110 of that of the standard.

6.2.5.1.3 Blanks

A method/reagent blank shall be included in each analytical run.

6.2.5.1.4 Reproducibility/accuracy

All unfamiliar matrices shall be prepared in triplicate.

Whenever possible, two additional preparations shall be spiked with the reference standard(s) to assess recovery/accuracy. The reproducibility between the two spiked samples as measured by percent relative difference shall be no greater than 20%.

1 2 7(– : KHQ VSLNQJ ZLWK WH UHHUHQFH VWDQGDUG LV SUHH Stohibitive, a control sample with a known result shall be tested as part of the analysis run; this shall include a certified reference material or a sample that has been analyzed in the past.

6.2.5.1.5 Continuing Calibration Verification (CCV)

Continuing Calibration Verification (CCV) standards shall be run after every 10 sample preparations and/or at the end of the run. The recovery for the CCV shall be within the uncertainty of the method for the data to be acceptable. CCV standards, which are run to confirm an existing calibration, must show recovery of 90-110%. If the result falls outside this range, a new calibration shall be run.

7 Test methods used by testing laboratories for detectLRQ RI FRQWP LQDQW – UDw materials and finished products

7.1 Test methods for metals

The presence of arsenic, cadmium, chromium (Total) (see following note), lead, and mercury (elemental) shall be measured in accordance with the following methods:

– VDP SOH SUHSDUDWRQ P HWKRG 6DP SOH VKDOO EH SUepared by microwave assisted acid digestion using a closed cell unit equipped with temperature monitoring. The temperature program and the

selection of reagents shall be modified or optimized as appropriate for the product being evaluated; and

– DCDQVWDO P HWRG 86(3A 200.7 *Metals: Inductively Coupled Plasma-Atomic Emission Spectrophotometric Method for Trace Element Analysis of Water and Wastes.* Alternate methodologies, such as graphite furnace atomic emission spectrophotometry, ICP-MS, and flow injection analysis may be used for specific samples at the discretion of the analyst.

127(– ,I WH FKURP IXP (VRXQ UHVXOWV FHHGV WH SDss/fail criteria (5.3.1), levels of Cr (VI) will be determined using a liquid chromatography method based on EPA Method 218.6. Modifications to the sample preparation and extraction procedures will be employed based on the dietary supplement product or ingredient matrix.

7.2 Pesticides

7.2.1 Multi-residue method

7KH P XOWUHVGXH P HWRG FRQWUROV LQ WH 86) ' A'V3HWide Analytical Manual I (PAM 1) shall be used to evaluate botanical products unless manufacturers have controls in place to screen for pesticides or use certified organic ingredients as demonstrated in the GMP audit.

7.2.2 Test methods for pesticides in *Panax ginseng* and *Panax quinquefolius*

Products containing *Panax ginseng* or *Panax quinquefolius* shall be evaluated based on the methods of WH 86) ' A'V3HWFLGHACD9WFDO DQXDQ (3A0 1) for the presence of the following pesticides:

alpha-benzene hexachloride
beta-benzene hexachloride
delta-benzene hexachloride
hexachlorobenzene
lindane (gamma-benzene hexachloride)
pentachloroaniline
pentachlorobenzene
pentachlorophenol
pentachlorothioanisole
quintozene (pentachloronitrobenzene)
tetrachloroaniline

7.3 Test methods for microbiological contaminants

7.3.1 Aflatoxins

Testing shall be performed based on the methods described in Chapter 49, Natural Toxins, pp 49-1 to 49-49 of the AOAC *Official Methods of Analysis.*

7.3.2 Yeast and mold

Testing shall be performed based on the USP Plate Count Method under Total Aerobic Microbial Count substituting Potato Dextrose Agar and altering the incubation time/temperature to 5-7 d at 25 °C (77 °F).

7.3.3 BDFWUD – VRXDCDHUREIF FRuQW

Testing shall be performed based on the USP Total Aerobic Microbial Count.

7.3.4 Enterobacteriaceae

Testing shall be performed based on the USP Total Aerobic Microbial Count substituting m-endo agar as the agar medium.

7.3.5 *Salmonella* sp

Testing shall be performed based on the USP Test for *Salmonella* sp.

7.3.6 *Escherichia coli*

Testing shall be performed based on the USP Test for *E. coli*.

7.3.7 *Staphylococcus aureus*

Testing shall be performed based on the USP Test for *S. aureus*.

7.3.8 *Pseudomonas aeruginosa*

Testing shall be performed based on the USP Test for *P. aeruginosa*.

7.4 Test methods for chemical contaminants

7HVWLQJ VKDOO EH SHUIRUPHG EDVHG RQ 86) ' A'V 0 HWKRG for Determination of Aristolochic Acid in Traditional Chinese Medicines and Dietary Supplements.

The most appropriate method shall be used to confirm claims for the product under evaluation. The source of these methods may include AOAC International, USP, EPA, FDA, AHP, European, German, Japanese monographs, INA, industry standards, etc. The use of any new method shall require that a validation be performed which includes an evaluation of specificity, linearity, reproducibility, spike recovery and method detection limit. More rigorous validation could follow according to the guidelines of ICH, FDA, CEN, GLP, AOAC, as appropriate.

Unless manufacturers have controls in place to assess the rancidity of oil ingredients, the following testing shall be performed. The Peroxide Value of the oil shall be tested according to AOAC Method 965.33 (which is equivalent to AOCS 8-53). The p-Anisidine Value of the oil shall be tested by AOCS Cd 18-90.[7] he Totox Number will be calculated as the sum of the p-Anisidine Value and two times the Peroxide Value.

The most appropriate method shall be used to confirm claims for the product under evaluation. The source of these methods may include AOAC International, USP, EPA, FDA, AHP, European, German, Japanese pharmacopoeial monographs, INA, industry standards, etc. The use of any new method shall require that a validation be performed which includes an evaluation of specificity, linearity, reproducibility, spike recovery and method detection limit. More rigorous validation could follow according to the guidelines of ICH, FDA, CEN, GLP, AOAC, as appropriate.

8 Good Manufacturing Practices

Written procedures shall be established and followed for the maintenance of Good Manufacturing Practices.

8.1 Personnel

8.1.1 Disease control

Any person who has an illness or medical condition, such as, but not limited to, open lesions or infected wounds, that could be a possible source of microbial contamination shall be removed from the manufacturing process so as to prevent adulteration of the product during manufacture and storage. Personnel shall be instructed to report such health conditions to their supervisors.

Written procedures shall be established and followed for these procedures.

8.1.2 Cleanliness

All personnel having direct contact with raw materials, in-process materials, exposed products, and packaging components, as well as those individuals utilizing processing equipment and utensils, shall conform to a level of basic hygiene and personal cleanliness while on duty to protect the product against adulteration. These methods may include but are not limited to:

- ZHDULQJ RXWHUZHDU HQWHULQJ SURGXFWLRQ DUHDV that the adulteration of products and equipment;
- PDLQWDLQLQJ SHUVRQDO FOHDQOLQHVV;
- ZDVKLQJ KDQGV WKRURXJKOH EHIRUH WDXWLQJ ZRUN DQG DWDQ\ RWKHUWLPH HZKHQ WKH KDQGV PDY KDYH become soiled or contaminated;
- UHPRYLQJ DQ\XQVHFXUHG PHWDO DQG KDQG PHWDO RU FRYHULQJ KDQG PHWDO WDWFDQ RWHH removed;
- XVLQJ JORYHV WKDWDUH PDLQWDLQHG LQ DQ LQWDFW\WFOHDQ DQG VDQLWDU\ FRQGLWRQ;
- ZHDULQJ KDLUQHW FDSV EHDUG FRYHUV DUP covers, or other effective hair restraints;
- WDUQJ FORWKLQJ RUWKHUSHUVRQDOHffects outside of processing areas;
- SUHYHQWLQJ SHUVRQDOFDUH SURGXFW IURP HQWHULQJ SURGXFWLQG
- H[FOXGLQJ WKH FRQXXP SWRQ RI IRRG drink, and medication, as well as the use of chewing gum and tobacco products in the processing areas.

Written procedures shall be established and followed.

8.1.3 Education and training

All personnel shall have written job descriptions and possess education, training, and/or experience to perform their assigned functions. All personnel shall receive GMP education and training to perform their assigned functions.

Written records of education and training shall be retained and routinely updated in order to document education and training progress.

Written procedures shall be established and followed.

8.1.4 Supervision

The responsibility for assuring compliance by all personnel with these requirements shall be assigned to qualified personnel with the proper education, training, and/or experience.

Written procedures shall be established and followed.

8.2 Plant and grounds

8.2.1 Grounds

The grounds of a manufacturing plant shall be kept in a condition that protects against adulteration of product. Methods shall include but are not limited to:

– VWRUDJH HTXLSP HQWSURSHUOB DQG UHP RYDO RI ZDVWH, and vegetation that could attract or harbor pests within the immediate vicinity of buildings;

– P DLQWDLQLQJ URDGV, yDUGV, SDUNLQJ DUHDV, DQG GUDLnage areas to prevent product adulteration or harbor pests; and

– GLVSRVLQJ RI DQZ DVWH DQG UXEEEVK VR DV VR prevent adulteration of the dietary product during manufacture and storage and to ensure a clean, safe work environment.

Written procedures shall be established and followed.

8.2.2 Plant construction and design

Plant buildings and structures shall be of a size, construction, and design to facilitate maintenance, cleaning, and sanitary operation and to prevent mix-ups between different raw materials and finished products. The plant facilities shall:

– SURYLGH VXIIILFLHQWVSDFH IRUSDFH HQWRI HTXLSP ent and storage and segregation of materials;

– SURYLGH RSHUDWLQJ SURFHVV RU HIIHFWVH GHVgn that reduces the potential for mix-ups or adulteration of in-process or finished products;

– IDFLOLWDWH P DLQWHQDQFH IXQFWLRQV LQFOXGLQJ FOHDQLQJ, sanitation, waste treatment and disposal, and elimination and prevention of pest infestations;

– SURYLGH DGHTXDWH QLKWLQJ LQ P DQXIDFWXULQJ DUHDV;

– SURYLGH VDIHWyVWSH QLKVEXOEV, II[WXUHV, DQG VNylights to protect against possible adulteration by glass breakage;

– SURYLGH YHQWLODWLRQ DLUIILOWUDWLnn, heating, and/or cooling to control microorganisms, dust, humidity, and temperature in order to prevent adulteration of product, and to provide a safe, clean work environment; and

– SURYLGH DGHTXDWH VFUHHQLQJ RUURWHUSURWHFWLRQ DJDLQVWSHWV.

Written procedures shall be established and followed.

8.3 Sanitation of buildings and facilities

8.3.1 General maintenance

All buildings, structures, fixtures, and equipment shall be constructed in such a manner that floors, walls, ceilings, work surfaces, and equipment can be cleaned and sanitized. All buildings and fixtures shall be maintained in a sanitary condition and shall be kept in good repair.

Written procedures shall be established and followed.

8.3.2 Cleaning and sanitizing agents

Cleaning and sanitizing agents, pesticide chemicals, and fungicides shall be safe and effective for their intended use. NSF registered proprietary substances and non-food compounds are acceptable when used for their intended use.

Cleaning and sanitizing agents, pesticide chemicals, and fungicides shall be identified, used, held, and stored in a manner that protects against adulteration of raw materials, in-process or finished products, or contamination of processing equipment, utensils, or packaging materials.

Written procedures shall be established and followed.

8.3.3 Pest control

Effective means shall be taken to exclude pests from the entire plant. The use of insecticides or rodenticides is permitted only with precautions and restrictions that protect against adulteration of raw materials, products, equipment, or packaging materials.

No evidence of pests shall be present on product or packaging or in the area.

Pest control inspections shall be performed routinely.

Written procedures shall be established and followed.

8.3.4 Water supply

Potable water, as a minimum quality water, at designated temperature and pressure where appropriate, shall be provided in all areas where required for processing and cleaning or for employee sanitary facilities. Water shall meet or exceed the standards prescribed in the USEPA National Primary Drinking Water Regulations (40 CFR part 141) or the WHO Guidelines for Drinking-Water Quality.

Written procedures shall be established and followed for these procedures.

8.3.5 Plumbing

Plumbing shall be of a size and design and installed and maintained to:

- FDUUy VXIIFLHQWXDQWWHV RI ZDWDUWUHTXLUHG GXFDWRQ/ WKURXJKRXWWH SODQW
- SURSHUO FRQYHy VHZDJH DQG GUDLQDJH ZDWWUP WKH SODQW
- DYRLG DGXOWUDWRQ RI SURGXFWWRUFRQWDP LQDWRQ RI ZDWUXSSOHV RUHTXLSP HQW
- SURYLGH LGRUGLDLQDJH DUHDV ZKHUH LQ DUHDV ZKHUH VXEMFWWR LGRGLQJ; DQG
- SUHYHQWFRQWDP LQDWRQ RI IUHVK ZDWUwith discharge wastewater or sewage.

Written procedures shall be established and followed.

8.3.6 Sewage disposal

Sewage shall be disposed into a properly maintained and approved sewage system that complies with local regulatory requirements.

Written procedures shall be established and followed.

8.3.7 Toilet facilities

Each plant shall provide its employees with readily accessible toilet facilities. Each plant shall maintain toilet facilities in a sanitary condition, properly stocked, and in good repair at all times. Each plant should provide self-closing doors that do not open into areas where materials and/or product are exposed to airborne contamination.

Written procedures shall be established and followed.

8.3.8 Hand-washing facilities

Hand-washing facilities shall be convenient and furnished with tempered running water and shall include:

- KDQG-Z DVKLQJ IDFLOLWLHV DWWDFK WRFDWLRQ Z KHUH employees are required to wash their hands;
- HIIHFWLYH KDQG-GUDLQLQJ DQG VDQLWLQJ SUHSDUDWLRQV;
- DLUGUyHUV RUVDQLWLVLQJ WRZHOHOHUHFHLYH;
- GHYLFHV RUII[WXUHV WKDW SURWHFW DJDLQVW WKH recontamination of clean, sanitized hands; and
- VLJQV GLUHFWLQJ HP SORyHHV WR Z DVK KDQGV EH RUH WKHy WDUWZ RUN DIWUHDFK DEVHQFH IURP WKHLU work station, or when their hands have become soiled or contaminated.

Written procedures shall be established and followed.

8.3.9 Rubbish disposal

Refuse receptacles and rubbish disposal practices that protect against adulteration or the harborage of pests shall be provided.

Written procedures shall be established and followed.

8.3.10 Supervision

The overall sanitation of the plant shall be under the supervision of one or more designated individuals with qualifications based on education, experience, and/or training.

Written procedures shall be established and followed.

8.4 Equipment and utensils

8.4.1 Design and construction

Equipment shall be constructed, installed, and maintained so as to facilitate the cleaning and disinfection of the equipment and the surrounding areas. Equipment shall be used for its intended purpose.

Equipment and utensils having direct contact with product shall be constructed of inert, non-toxic materials and designed to withstand the environment to which it is subjected during the manufacturing process and during cleaning and disinfection.

Seams on utensils and processing equipment shall be smoothly bonded or maintained to minimize the accumulation of residues and the opportunity for growth of microorganisms.

All plant equipment and utensils shall be designed, constructed, and maintained to preclude the adulteration of raw materials, packaging materials, in-process materials, and finished product with lubricants, fuel, metal fragments, contaminated water, or any other contaminants.

Cleaners, disinfectants, sanitizers, lubricants, and/or coolants used on utensils and processing equipment shall be suitable for use in food processing.

All equipment with critical parameters that require monitoring shall have suitable measuring devices such as time, temperature, pressure, and/or speed controls, etc.

Each freezer and cold storage compartment shall be fitted with a temperature-measuring device, automatic control, or alarm system.

Compressed air and other gases that come into contact with a product or ingredient or are used to clean equipment or utensils shall be treated in such a way that the materials with which they come in contact are not adulterated.

Instruments and controls shall be accurate and maintained.

Written procedures shall be established and followed.

8.4.2 Sanitation of equipment and utensils

All utensils and equipment shall be cleaned as frequently as necessary to ensure quality and integrity of the product using safe cleaning and sanitizing agents, then stored in a manner that protects against recontamination.

A written record of major equipment cleaning and use shall be maintained in individual equipment logs that show the date, product, and lot number of each batch processed and the cleaning or maintenance performed. The person(s) performing the cleaning and/or maintenance shall record in the log that the work was performed. Entries in the log shall be in chronological order. Manufacturers shall provide rationale for the selection of cleaning and sanitizing methods.

Written procedures shall be established and followed.

8.5 Quality assurance/control and laboratory operations

8.5.1 Quality assurance/control operations

Quality control operations shall be employed to assure products conform to standards of purity, quality, and composition and that packaging materials are safe for their intended purposes.

Written procedures shall be established and followed.

8.5.2 Quality assurance/control unit

There shall be a quality assurance/control unit that has the responsibility and final authority to:

– DSSURYH RUUHMHFWDOOSURFHGXUHV, specifications, controls, test methods, and results that impact the purity, quality, and composition of an ingredient or product;

– DSSURYH RUUHMHFWDOOUDZ P DWHULDOV, SDFNDJLQJ P DWHrials, labeling, and finished products, including contract-manufactured products based upon conformance to established specifications;

– UHYLHZ VWDWXV RI SURGXFW EDWFKHV KDYH VWH final authority to determine if the product is approved for distribution. This evaluation shall be documented and maintained as part of the batch record;

– HVWDEOLVK SURFHGXUHV IRU FKDQJLQJ RUUHYLVLQJ all documentation (such as procedures, methods, record keeping, formulas, etc.);

– UHYLHZ DQG DSSURYH DOO FKDQJHV WR GRFXP HQWDWLRQ (such as procedures, methods, record keeping, formulas, etc.);

– DVVXUH WKDW WKH P RVW FXUUHQW revision of all documentation (such as procedures, methods, record keeping, formulas, etc.) is in use at all times;

– LP SOP HQW FRUUHFW DFWLRQ Z KHQ GRFXP HQWG SURFHGXUHV DUH GRWRQ HG DQG

– DSSURYH RUUHWF WH YDWRQV FRP P LWWG in the manufacturing of a product.

GMP internal audits shall be performed by the quality control unit periodically with documented corrective action kept on file.

The responsibilities and procedures applicable to the quality control unit shall be established in writing and followed.

Written procedures shall be established and followed.

8.5.3 In-house and/or contract laboratories

In-house and/or contract laboratories shall be available for performance of the quality assurance/control tasks and responsibilities.

Written procedures shall be established and followed.

8.5.4 Test methods

All test methods used for ingredient and product testing shall be reliable and yield appropriately reproducible and accurate results.

Written procedures shall be established and followed.

8.5.5 Laboratory records

Records of laboratory data derived from all specified tests shall be maintained.

Written procedures shall be established and followed.

8.5.6 Shelf life

All products shall bear an expiration date or a statement of product shelf life as appropriate or dictated by governing regulatory authorities. These dates shall be supported by data and/or rationale to reasonably assure the product meets manufactuUHUV HVWDEOLVKHG VSHFLILFDWRQV WKURXJ KRXWW H SURGXFWWKHDOLH.

Accelerated stability studies or data from similar product formulations may be used for an initial determination of shelf life. Product shelf life may be confirmed and may be extended on the basis of real-time studies on product stored under labeled storage conditions.

0 DQXIDFWXUHUV HVWDEOLVKHG VSHFLILFDWLRQV P Dy LQFOXGH organoleptic or other qualitative or quantitative testing.

Written procedures shall be established and followed.

8.6 Production and process controls

8.6.1 Master production and control records

A master production and control record (e.g., manufacturing formula, raw materials specifications, component specifications, finished product specifications) shall be prepared for the manufacture of each product and shall be reviewed and approved by the quality control unit.

Master production and control records shall include:

- D FRP SOHWH QDPH RU UDZ P DWHULDO XVHG LQ WKH P anufacture of the product, designated by names or codes sufficiently specific to indicate any special quality characteristic(s) and other specifications;

- WKH DP RXQWRI HDFK UDZ P DWHULDO XVHG (DFK EDWFK shall be formulated to provide not less than 100% of each claimed dietary ingredient throughout the shelf life of the product;

- WKH QDP H DQG ZHLJKWRUP HDVXUH of each dietary ingredient per unit or portion or per unit of weight or measure of the product;

- D WDWP HQWRI WKH WRWDOZ HLJKWRUP HDVXUH RI DQy GLHWDU VXSSOHP HQWXQLW

- D WDWP HQWRI WKH WKHRUHWFDOZ HLJKWRUP HDVure of the manufactured product and the acceptable range beyond which an investigation is required;

- D GHVFULSWRQ RI WKH SURGXFWFRQWDLQHU(V), FORVXUHs(s), and product label(s), including positive identification of all labeling used; and

- P DQXIDFWXUQJ DQG SURFHVV FRQWROQOWXFWRQV.

Written procedures shall be established and followed.

8.6.2 Batch production and control records

Batch production and control records shall be prepared and followed for each batch of product. These records shall include complete information relating to the production and control of each batch. These records shall be an accurate reproduction of the appropriate master production and control record and shall include documentation that each significant step in the manufacturing process was accomplished, including:

- GDWH;

- LGHQWLWRI LQGLYLGXDOP DWHUHTXLSP HQWDQG QHV XVHG;

- VSHFLLF LGHQWLFDWRQ LQFOXGLQJ EDWFXP EHU RI each raw material or in-process material used;

- ZHLJKWRUP HDVXUH RI HDFK UDZ P DWHUial used in the course of processing;

- LL SHUFRUP HG LQ-SURFHVV WHVWLQJ UHVXOW;

- TXDOWY FRQWROUHVXOW;

- IQ\SHFWLRQ RI WKH SDFNDJLQJ DQG OEHOLQJ DUHDV;
- D VWDWP HQWR WKH DFWDO\LHOG at the conclusion of each critical process step of the manufacture and a statement of the percentage of theoretical yield, as appropriate;
- OEHOFRQWROUHFRUGV, IQFOXGLQJ VSHFLP HQs, copies, or records of all labels used;
- GHVFULSWRQ RI SURGXFWRQWROLHV DQG FRXXUHV XVHG;
- DQy VSHFLDOCRRWV RI IQYHVWJDWRQ RUGHviations from the described process; and
- IGHQWLFDWRQ RI WKH SHUVRQ SHUFRUP IQJ and directly supervising described process.

Any deviations from written and approved specifications, standards, and test methods shall be recorded on the batch record and justified.

Written procedures shall be established and followed.

8.6.3 Handling and storage of raw materials, in-process materials, and rework

Raw materials, in-process materials, and rework shall be inspected and segregated or otherwise handled as necessary to verify they are clean and suitable for processing. They shall be stored and transported under conditions that protect against adulteration and minimize deterioration.

Containers of raw materials shall be inspected upon receipt to assure that their condition has not contributed to the adulteration or deterioration of the contents.

Raw agricultural materials that contain soil or other extraneous material shall be washed or cleaned, as necessary.

Raw materials, in-process materials, and rework shall be held in bulk or in containers and under conditions of temperature and humidity that prevents the materials from becoming adulterated or contaminated.

Written procedures shall be established and followed for the receipt, identification, examination, handling, sampling, testing, and approval or rejection of raw materials.

Written procedures shall be established and followed for the receiving, processing, storage, and final delivery of product requiring temperature control.

Each lot of raw material shall be identified with a distinctive lot number and shall be controlled according to its status (e.g., quarantined, approved, or rejected).

Each lot of raw material, in-process material, and rework that is liable to adulteration with filth, insect infestation, or other visually evident extraneous materials shall be examined against established specifications.

Each lot of raw material, in-process material, and rework that is liable to microbiological contamination that is objectionable in view of its intended use shall be subjected to microbiological tests before use.

Raw materials and other ingredients susceptible to adulteration with aflatoxin or other natural toxins shall comply with current USFDA regulations, guidelines, and action levels for poisonous or deleterious substances before these materials or ingredients are incorporated into a finished dietary ingredient or dietary supplement.

At a minimum, a representative sampling/testing program shall be in place to evaluate the presence of microbial contamination, aflatoxin or other natural toxins, and all other established specifications.

Written procedures shall be established and followed to verify the identity of each lot of raw material.

Approved raw materials shall be rotated so the oldest approved stock is used first.

Raw materials shall be retested or reexamined after a specified time in storage or after exposure to conditions that are likely to adversely affect the purity, quality, or composition of the raw material.

Rejected raw materials shall be identified and controlled under a system that prevents their use in manufacturing or processing operations, and they shall be stored in separate storage facilities.

Written procedures shall be established and followed.

8.6.4 Manufacturing operations

All operations in the receiving, inspecting, transporting, segregating, preparing, manufacturing, packaging, and storing of dietary products shall be conducted in accordance with sanitation principles in a manner that provides protection against adulteration from chemical, microbiological, or other extraneous sources.

Written procedures shall be established and followed for all inspection, manufacturing, packaging, and storage operations.

Effective measures shall be taken to segregate raw materials, packaging materials, in-process materials, rework, and finished products.

All containers, processing lines, and major equipment used during the production of a batch shall be identified at all times to indicate their contents.

Effective measures shall be taken to protect against the inclusion of metal or other extraneous material in the product.

Effective measures shall be taken for the identification, storage, and disposal of rejected or adulterated products.

Written procedures shall be established and followed that describe tests to be conducted to assure the purity, compositions, and quality of the finished product.

Written procedures shall be established and followed prescribing the method for reprocessing batches that do not conform to finished goods standards or specifications.

Written procedures shall be established and followed.

8.6.5 Packaging and labeling operations

Filling, assembling, packaging, and other operations shall be performed in such a way that products are protected against adulteration.

Written procedures shall be established and followed for the receipt, storage, and examination of packaging materials.

Labels for each different product type, strength, or quantity of contents shall be stored separately and controlled in a manner consistent with Good Manufacturing Practices.

Obsolete labels, labeling, and other packaging materials shall be destroyed and such destruction documented in writing.

Written procedures shall be established and followed to assure that the correct labels, labeling, and packaging materials are issued and used.

Packages shall be identified with a lot number that permits determination of the history of the manufacture and control of the batch.

Packaging shall be examined to provide assurance that the containers and packages in the lot have the correct labels and lot numbers.

Written procedures shall be established and followed.

8.7 Warehousing, distribution, and post-distribution processes

8.7.1 Storage and distribution

Storage and transportation of finished product shall be conducted under conditions that protect product against physical, chemical, and microbial adulteration, as well as deterioration of the product and container.

Distribution records shall be maintained and retained for at least one year beyond the expiration date or shelf life.

Written procedures shall be established and followed.

8.7.2 Written recall procedures

Procedures shall be established and followed that define the recall of product(s) should it become necessary.

Written procedures shall be established and followed.

8.7.3 Complaint files

Written procedures shall be established and followed for the handling of all written and oral product complaints. Such procedures shall provide for review by the quality control unit and the determination of the need for an investigation.

A written record of each complaint shall be maintained for at least one year after the expiration or shelf life date of the product, or one year after the date that the complaint was received, whichever is longer. The written record shall include, where known, the name and description of the product, lot number, source and nature of the complaint, and response, if any. When an investigation is conducted, the written record shall include the findings of the investigation and follow-up action taken.

8.7.4 Returned products

Returned products shall be identified as such and held. Unless examination, testing, or other investigations prove the product meets standards of purity, composition, and quality, it shall be controlled to prevent redistribution.

A returned product may be reprocessed provided that the subsequent product meets appropriate quality and safety specifications.

Records pertaining to returned products that are reprocessed and/or redistributed shall be maintained and shall include the name and description of the product, lot number, reason for the return, quantity returned, date of disposition, and ultimate disposition of the returned product.

Records shall be maintained for at least one year after the expiration or shelf life date of the batch of product.

Written procedures shall be established and followed.

8.7.5 Product salvaging

Products that have been subjected to improper storage conditions including, but not limited to, hazardous chemicals, extremes in temperature, humidity, smoke, fumes, pressure, age, or radiation due to natural disasters, fires, accidents, or equipment failures shall not be salvaged and returned to the marketplace.

Written procedures shall be established and followed.

8.7.6 Defect action level

Some dietary ingredients and dietary supplements, even when produced under GMP, contain natural or unavoidable defects that at low levels are not hazardous to health. The USFDA and other applicable regulatory agencies have established maximum levels for these defects in foods produced under GMP and uses these levels in deciding whether to recommend regulatory action.

Defect action levels shall also be established for dietary products whenever it is necessary and feasible to do so. The manufacturer of a dietary product shall utilize quality control operations that reduce natural or unavoidable defects to the lowest level that is currently feasible.

The mixing of a dietary ingredient or dietary supplement containing defects beyond any established defect action level with another lot of dietary ingredient or dietary supplement shall not be permitted and renders the final lot adulterated, regardless of the defect level of the final product.

Written procedures shall be established and followed.

8.7.7 Reserve samples

A reserve sample of each raw material and each batch of a product, at least twice the quantity necessary to perform all the required tests, shall be retained, packaged, and stored under conditions consistent with the product labeling until at least one year after the expiration date.

Written procedures shall be established and followed.

8.8 Files for substantiation of health claims and statements of nutritional support

A file shall be maintained that includes information for substantiating health claims and statements of nutritional support.

Written procedures shall be established and followed.

8.9 Compliance with *The Public Health Security and Bioterrorism Preparedness and Response Act of 2002.*

Manufacturers of Dietary Supplements shall submit application to US FDA for registration, receive a Registration Number, and shall provide the Registration Number upon request.

8.10 Records retention

Written procedures shall be established and followed for record keeping.

Regulatory inspections shall be kept on file with documented corrective action.

Any testing, production, control, or distribution record and records required for Good Manufacturing Practices shall be retained for at least one year after the expiration or shelf life date of the batch.

Raw materials records shall be maintained for at least one year after the expiration or shelf life date of the last batch of product incorporating the raw material.

All records relating to the manufacture of a product including, but not limited to, maintenance, cleaning, and calibration of equipment, shall be maintained for at least one year after the expiration or shelf life date of the last batch of product produced.

7DEOH1 – 7HVWP HWKRGV IRUGLHWDU\ LQJUHGLHQW

Dietary ingredient Latin binomial (standardized common name)	Plant part	Chemical identification method	Source of methods	Validation of method[1]
Actaea racemosa (Black Cohosh)	root/rhizome	TLC[2]	BHP	mutual recognition
Aesculus hippocastanum (Horse Chestnut)	fruit	TLC[2]	BHP	mutual recognition
Allium sativum (Garlic)	cloves	TLC[2]	USP	mutual recognition
Astragalus membranaceus (Astragalus Root)	root	TLC[2]	AHP	mutual recognition
Capsicum annuum (Cayenne)	fruit	TLC[2]	BHP	mutual recognition
Crataegus monogyna, Crataegus laevigata (Hawthorn)	berry/leaf/flower	TLC[2]	AHP	mutual recognition
Echinacea angustifolia, Echinacea pallida Echinacea purpurea, (Echinacea)	root/aerial parts	TLC[2]	BHP	mutual recognition
Eleutherococcus senticosus (Eleuthero)	root/rhizomes	TLC[2]	BHP	mutual recognition
Ganoderma lucidum (Reishi Mushroom)	whole	TLC[2]	AHP	mutual recognition
Ginkgo biloba (Ginkgo)	leaf	TLC[2]	USP	mutual recognition
Hydrastis Canadensis L. (Goldenseal)	root	TLC[2]	BHP	mutual recognition
Hypericum perforatum (6W-RKQV Wort)	aerial parts	TLC[2]	AHP	mutual recognition
Matricaria recutita (Chamomile)	aerial parts	TLC[2]	USP	mutual recognition
Panax ginseng (Asian Ginseng) (Chinese Ginseng) (Korean Ginseng)	Root	TLC[2]	USP	mutual recognition
Piper methysticum (Kava)	rhizome	TLC[2]	BHP	mutual recognition
Serenoa repens (Saw Palmetto)	berry	TLC[2]	USP	mutual recognition
Salix daphnoides, Salix fragilis, Salix pentandra, Salix purpurea (Willow Bark)	Bark	TLC[2]	AHP	mutual recognition
Silybum marianum (Milk Thistle)	seed	TLC[2]	USP	mutual recognition
Schisandra chinensis (Schisandra Berry)	berry	TLC[2]	AHP	mutual recognition
Tanacetum parthenium (Feverfew)	aerial parts	TLC[2]	USP	mutual recognition
Uncaria tomentosa (&DW &DZ)	EDUN	7/ &[2]	BHP	mutual recognition
Vaccinium macrocarpoon, Vaccinium oxycoccos (Cranberry Fruit)	fruit	HPLC[3]	USP	mutual recognition
Valeriana officinalis (valerian)	root	TLC[2]	AHP	mutual recognition
Viburnum opulus (Cramp Bark)	stem/root	TLC[2]	AHP	mutual recognition
Viburnum prunifolium (Black Haw Bark)	stem/root	TLC[2]	AHP	mutual recognition
Vitex agnus-castus (Chaste tree)	fruit	HPTLC[4]	AHP	mutual recognition
Withania somnifera (Ashwagandha Root)	root	TLC[2]	AHP	mutual recognition
Zingiber officinale (Ginger)	root/rhizome	TLC[2]	USP	mutual recognition

© 2005 1 6)

7DEOH 1 – 7HVWP HWKRGV IRUGLHWDU\ LQJUHGLHQW

[1] Methods Validation Levels (AOAC draft document dated 12/13/00)	
1. Collaborative Method Validation	8-10 laboratory validation study
2. Mutual Recognition Method Validation	3-4 laboratory validation study
3. Peer-Verified Method Validation	Single independent laboratory validation study in addition to in-house validation
4. In-House Method Validation	In-house validation study with but not limited to accuracy, precision, linearity, ruggedness, robustness, specificity, sensitivity, limit of detection, and limit of quantitation.
5. Emergency Method Validation	Validation study with two different positive and negative controls.
[2] TLC = thin layer chromatography	
[3] HPLC = high performance liquid chromatography	
[4] HPTLC = high performance thin layer chromatography	

– FRQFOXGHG –

7DEOH 2 – 7HVWP HWKRGV IRUP DUNHUFRQVWWHQWFRP SRuQGV

Dietary ingredient Latin binomial (Standardized common name)	Marker constituent compound	Test method	Validation of method
Actaea racemosa (Black cohosh)	Actein, 26-deoxycimifigoside, Cimiracemoside A, 27-deoxyactein, Acetyl shengmanol xyloside, Cimicifugoside, Cimiracemoside F, Cimiracemoside C, and Cimiracemoside E.	INA, Black Cohosh Assay by ELSD	mutual recognition method
Allium sativum (Garlic)	Allicin	INA, Allicin by High-Performance Liquid Chromatography	in-house method
Astragalus membranaceus (Astragalus Root)	Calycosin, Formononetin, Ononin	AHP, Astragalus Flavonoids by HPLC	mutual recognition method
Camellia sinensis (Green tea)	Epigallocatechin, catechin, Epicatechin, Epigallocatechin gallate, Catechin Gallate, Gallocatechin gallate, Epicatechin Gallate and Gallic acid	INA, Catechins and Gallic Acid in Green Tea by HPLC	in-house method
Crataegus monogyna, Crataegus laevigata (Hawthorn Leaf and Flower)	Vitexin	AHP, Flavonoids in Hawthorn Leaf and Flower by HPLC	mutual recognition method
Echinacea angustifolia Echinacea pallida Echinacea purpurea (Echinacea)	Caftaric acid, Cichoric acid, Chlorogenic acid, Echinacoside	INA, Phenolics in Echinacea by HPLC	in-house method
Ginkgo biloba (Ginkgo)	Ginkogolide A, Ginkgolide B, Bilobalide	INA, Ginkoterpenoid Assay by HPLC	in-house method
Ginkgo biloba (Ginkgo)	Kaempferol, Quercetin, Isorhamnetin	INA, Ginkgo Flavonol Glycoside Assay by HPLC	in-house method
Hypericum perforatum (6W-RKQV: RUW	Rutin trihydrate, Hyperoside, Hypericin, Quercitrin, Chlorogenic Acid, Hyperforin, Isoquercitrin, Quercetin, Pseudohypericin	,1A, 6W-RKQV: RUW Assay by HPLC	in-house method
Piper methysticum (Kava)	Desmethoxyyangonin, Dihydromethysticin, Dihydrokavain, Methysticin, Yangonin, Kavain	INA, Kavalactone Assay by HPLC	in-house method
Salix daphnoides, Salix fragilis, Salix pentandra, Salix purpurea (Willow Bark)	Salicin, L-Picein	AHP, Willow Bark Assay by HPLC	in-house method
Schisandra chinensis (Schisandra Berry)	Schisandrin A, Schisandrin B	AHP, Schisandra berry Assay by HPLC	mutual recognition method

7DEOH 2 – 7HVWP HWKRGV IRUP DUNHUFRQWWUDHQWFRP SRuQGV

Dietary ingredient Latin binomial (Standardized common name)	Marker constituent compound	Test method	Validation of method
Serenoa repens (Saw palmetto)	Hexanoic, Hexanoic, Nonanoic Decanoic, Dodecanoic, Tetradecanoic, Hexadecanoic, Heptadecanoic, Octadecanoic, 9-Octadecenoic, 9,12-Octadecadienoic, 9,12,15-Octadecatrienoic acids	INA, Fatty Acid Content in Saw Palmetto by Gas Chromatography	in-house method
Serenoa repens (Saw palmetto)	Stigmasterol, campesterol, brassicasterol, and ß-sitosterol	INA, Sterols Content in Saw Palmetto by Gas Chromatography	in-house method
Valeriana officinalis (Valerian)	Valerenic acid, acetoxyvalerenic acid, hydroxyvalerenic acid	AHP, Valerenic Acids in Valerian by HPLC	mutual recognition method
Vitex agnus-castus (Chaste tree)	Casicin	AHP, Casticin Assay in Chaste Tree Fruits by HPLC	mutual recognition method

– FRQFOXGHG –

7DEGI3 – AFFHSWDEGI CP LW IRUP LFUREIRGJ LFDC contaminants in botanical raw materials

Ingredient	Aerobic	Yeast / Mold	Entero-bacteriaceae	*Salmonella sp.*	*E. coli*	*S. aureus*
Allium cepa (Onion)	1×10^5	1×10^4	1×10^3	absent	absent	N/A
Allium sativum (Garlic)	1×10^5	1×10^4	1×10^3	absent	absent	N/A
Aloe vera	1×10^7	1×10^5	1×10^3	absent	1×10^2	N/A
Aloe vera gel	1×10^5	1×10^4	N/A	absent	N/A	absent
Astragalus membranaceus *Astragalus mongholicus* (Astragulus)	1×10^7	1×10^5	1×10^3	absent	1×10^2	N/A
Brucea javanica (Java brucea)	1×10^7	1×10^5	1×10^3	absent	1×10^2	N/A
Bupleurum chinense (Bupleurum)	1×10^7	1×10^5	N/A	absent	1×10^2	N/A
Centella asiatica (Asiatic pennywort)	1×10^7	1×10^5	1×10^3	absent	1×10^2	N/A
Matricaria recutita (Chamomile)	1×10^7	1×10^5	1×10^3	absent	1×10^2	N/A
Cinnamomum verum (Cinnamon)	1×10^7	1×10^5	1×10^3	absent	1×10^2	N/A
Coptis chinensis (Chinese Goldthread)	1×10^7	1×10^5	1×10^3	absent	1×10^2	N/A
Curcuma longa (Common Turmeric)	1×10^7	1×10^5	1×10^3	absent	1×10^2	N/A
Echinacea angustifolia, Echinacea pallida, Echinacea purpurea, (Echinacea)	1×10^7	1×10^5	1×10^3	absent	1×10^2	N/A
Ginkgo biloba (Ginkgo)	1×10^7	1×10^5	1×10^3	absent	1×10^2	absent
Glycrrhiza echinata (Licorice)	1×10^7	1×10^5	1×10^3	absent	1×10^2	absent
Hypericum perforatum (6W-RKQV: RUW	1×10^5	1×10^4	N/A	absent	absent	absent
Paeonia lactiflora (Chinese Peony)	1×10^7	1×10^5	1×10^3	absent	1×10^2	N/A
Panax ginseng (Asian ginseng)	1×10^7	1×10^5	1×10^3	absent	1×10^2	absent
Plantago ovata (Indian plantain)	1×10^5	1×10^4	1×10^3	absent	absent	N/A
Platycodon grandiflorum (Platycodon)	1×10^7	1×10^5	1×10^3	absent	1×10^2	N/A
Rauvolfia serpentina (Rauwolfia)	1×10^7	1×10^5	1×10^3	absent	1×10^2	N/A
Rheum palmatum (Chinese rhubarb)	1×10^7	1×10^5	1×10^3	absent	1×10^2	N/A
Senna alexandrina (Senna)	1×10^7	1×10^5	1×10^3	absent	1×10^2	N/A
Serenoa repens extract (Saw Palmetto)	1×10^5	1×10^4	N/A	absent	absent	absent
Silybum marianum extract (Milk Thistle)	1×10^5	1×10^4	N/A	absent	absent	absent
Tanacetum parthenium extract (Feverfew)	1×10^5	1×10^4	N/A	absent	absent	absent
Thymus vulgaris (Thyme)	1×10^5	1×10^4	1×10^3	absent	absent	N/A
Valeriana officinalis (Valerian)	1×10^7	1×10^5	1×10^3	absent	1×10^2	N/A
Powdered valerian extract	1×10^5	1×10^4	1×10^3	absent	absent	absent
Zingiber officinale (Ginger)	1×10^7	1×10^5	1×10^3	absent	1×10^2	absent

Units are presented in CFU/g or mL.

N/A = not applicable

© 2005 1 6)

7DEOH 4 – AFFHSWDEOH OLPLWV RU PLFURELRORJLcal contaminants in finished product

Finished Product	Aerobic	Yeast/ mold	Entero-bacteriaceae	*Salmonella sp.*	*E. coli*	*S. aureus*
finished products containing only vitamins and minerals	3×10^3	3×10^2	1×10^2	absent	absent	absent
other finished products	1×10^5	1×10^4	1×10^2	absent	absent	absent
Units are presented in CFU/g or mL.						

 © 2005 1 6)

This page is intentionally blank.

Annex A
(normative)

Botanicals known or suspected to contain aristolochic acid[21]

Aristolochia spp.
Aristolochia acuminata
Aristolochia argentina
Aristolochia baetica
Aristolochia bracteata
Aristolochia chilensis
Aristolochia cinnabarina
Aristolochia clematitis
Aristolochia contorta
Aristolochia cymbifera
Aristolochia debilis
Aristolochia elegans
Aristolochia esperanzae
Aristolochia fangchi
Aristolochia fimbriata
Aristolochia indica
Aristolochia kaempferi
Aristolochia kwangsiensis
Aristolochia macrophylla
Aristolochia manschuriensis
Aristolochia maurorum
Aristolochia maxima
Aristolochia mollissima
Aristolochia pistolochia
Aristolochia rigida
Aristolochia rotunda
Aristolochia serpentaria
Aristolochia watsoni
Aristolochia watsonii
Aristolochia westlandi
Aristolochia westlandii
Aristolochia zollingeriana
Asarum canadense
Asarum himalacium
Asarum himalaycum
Asarum splendens
Asaum forbesii
Asarum heterotrpoides
Asarum sieboldii
Akebia spp.
Akebia quinata
Akebia trifoliate
Bragantia wallichii
Clematis spp.
Clematis armandii
Clematis chinensis
Clematis hexapetala
Clematis montana
Clematis uncinata
Cocculus spp.
Cocculus carolinus
Cocculus diversifolius
Cocculus hirsutus
Cocculus indicus
Cocculus laurifolius
Cocculus leaebe
Cocculus madagascariensis
Cocculus orbiculatus
Cocculus palmatus
Cocculus pendulus
Cocculus thunbergii
Diploclisia affinis
Diploclisia chinensis
Menispernum dauricum
Saussurea lappa
Sinomenium acutum
Stephania spp.
Stephania tetrandra
Vladimiria souliei

[21] The source of this table is an April 19, 2001 U.S. FDA correspondence from the Office of Nutritional Products, Labeling and Dietary Supplements (www.cfsan.fda.gov/~/~dms/ds-bot14.html).

© 2005 1 6)

This page is intentionally blank.

© 2005 1 6)

Annex B
(informative)

Reference information for contaminant level acceptance criteria

This annex contains reference information regarding the sources of information used to establish acceptance criteria for contaminant levels.

B.1 Metals

Acceptance limits for cadmium and lead were obtained from the Joint FAO/WHO Expert Committee on Food Additives, World Health Organization,[22] International Programme on Chemical Safety, Safety Evaluation of Certain Food Additives and Contaminants.

The acceptance limit for chromium was obtained from the U.S. Environmental Protection Agency[23] (1998), Integrated Risk Information System (IRIS): Hexavalent Chromium.

The acceptance limit for mercury was obtained from the U.S. Environmental Protection Agency[19] (1989), Integrated Risk Information System (IRIS): Mercury (inorganic).

The acceptance limit for arsenic was obtained from the British Herbal Pharmacopoeia.[24]

[22] World Health Organization, 1211 Geneva 27, Switzerland

[23] U.S. Environmental Protection Agency, Environmental Criteria and Assessment Office, Cincinnati, Ohio

[24] British Herbal Medicine Association, British Herbal Pharmacopoeia, 1996

B.2 Microbiological contaminants

B.2.1 The acceptance limits contained in table 3 for the following microbiological contaminants were obtained from the World Health Organization.

Allium cepa (Onion)
Allium sativum (Garlic)
Aloe vera, Aloe Vera gel
Astragalus membranaceus, Astragalus mongholicus (Astragulus)
Brucea javanica (Java brucea)
Bupleurum chinense (Bupleurum)
Centella asiatica (Asiatic pennywort)
Matricaria recutita (Chamomile)
Cinnamomum verum (Cinnamon)
Coptis chinensis (Chinese Goldthread)
Curcuma longa (Common Turmeric)
Echinacea angustifolia, Echinacea pallida, Echinacea purpurea; (Echinacea)
Gingko biloba (Ginkgo); *Glcyrrhiza echinata* (Licorice)
Paeonia lactiflora (Chinese Peony)
Panax ginseng (Asian ginseng,Chinese ginseng, Korena ginseng)
Plantago ovata (Psyllium seed)
Platycodon grandiflorum (Balloon flower)
Rauvolfia serpentina (Rauwolfia)
Rheum palmatum (Chinese rhubarb)
Senna alexandrina (Senna)
Thymus vulgaris (Thyme)
Valeriana officinalis (Valerian)
Zingiber officinale (Ginger)

B.2.2 The acceptance limits contained in table 3 for the following microbiological contaminants were obtained from the U.S. Pharmacopeia National Formulary.

Gingko biloba (Ginkgo)
Glcyrrhiza echinata (Licorice);
Hypericum perforatum (6W-RKQV: RUW
Panax ginseng (Asian ginseng, Chinese ginseng, Korena ginseng)
Serenoa repens (Saw Palmetto)
Silybum marianum (Milk Thistle)
Tanacetum parthenium (Feverfew)
Powdered valerian extract; *Zingiber officinale* (Ginger)

© 2005 1 6)

Annex C
(informative)

Calculating acceptance criteria

This annex contains information for calculating acceptance criteria for metal contamination levels for finished products.

C.1 Normalization of laboratory data

Normalization is the mathematical adjustment of laboratory results to estimate actual human exposure ©MHOY EDVHG XSRQ WKH P DQXI DFWXUHUV UHFRP P HQGHG GDLO GRVDJH

C.2 Sampling and reporting of laboratory data

The laboratory will test a quantity of sample sufficient to minimize sampling error and to reach the desired limit of detection that is required for each metal contaminant.

The laboratory results will be reported in milligrams of contaminant per gram of tested product (mg/g) for solid materials. If the product is a liquid, it will be reported as milligram contaminant per milliliter of tested product (mg/mL).

C.3 Normalization calculations

- 1 RUP DOLHG FRQFHQWUDWRQ P J FRQWDP LQDQW J ILQLVKHG SURGXFW [0 D[LP XP ' DLO ' RVDJH (MDD); and
- 0 ' ' P D[LP XP GRVH UHFRP P HQGHG Ey WKH P DQXI DFWXUHUR WKH ©EHO

The normalized concentration is compared to the acceptance criteria for finished product.

Example:

- 0 ' ' (2) 500P J WDE©WV WDNHQ 3 WP HV D GDy 3J R SURGXFW
- SHUOERUDWRUy UHVXOW, WKH P J FRQWDP LQDQW ILQLVKHG SURGXFW 0.002P J ©DG/J ILQLVKHG SURGXFW
- CRUP DOLHG FRQFHQWUDWRQ 0.006mg/d = 0.002mg lead/g finished product x 3g (MDD); and
- DFFHSWDFH FULWHULD IRU©DGLV 0.02P g/d, therefore product is acceptable.

© 2005 1 6)

This page is intentionally blank.

Standards and Criteria[25]

The following standards and criteria established and adopted by NSF as minimum voluntary consensus standards are used internationally:

2 Food equipment
3 Commercial warewashing equipment
4 Commercial cooking, rethermalization, and powered hot food holding and transport equipment
5 Water heaters, hot water supply boilers, and heat recovery equipment
6 Dispensing freezers
7 Commercial refrigerators and freezers
8 Commercial powered food preparation equipment
12 Automatic ice making equipment
13 Refuse processors and processing systems
14 Plastics piping system components and related materials
18 Manual food and beverage dispensing equipment
20 Commercial bulk milk dispensing equipment
21 Thermoplastic refuse containers
24 Plumbing system components for manufactured homes and recreational vehicles
25 Vending machines for food and beverages
29 Detergent and chemical feeders for commercial spray-type dishwashing machines
35 High pressure decorative laminates (HPDL) for surfacing food service equipment
36 Dinnerware
37 Air curtains for entranceways in food and food service establishments
40 Residential wastewater treatment systems
41 Non-liquid saturated treatment systems
42 ' UIQNQJ Z DWLUWHDW HQWXQIW – AHWKHIF HIIHFW
44 Residential cation exchange water softeners
46 Evaluation of components and devices used in wastewater treatment systems
49 Class II (laminar flow) biosafety cabinetry
50 Circulation system components and related materials for swimming pools, spas/hot tubs
51 Food equipment materials
52 Supplemental flooring
53 ' UIQNQJ Z DWLUWHDW HQWXQIW – + HDQW HIIHFW
55 Ultraviolet microbiological water treatment systems
58 Reverse osmosis drinking water treatment systems
59 Mobile food carts
60 ' UIQNQJ Z DWLUWHDW HQWFKHP LFDQ – + HDQW HIIHFW
61 ' UIQNQJ Z DWLUyWWP FRP SRQHQW – + HDQW HIIHFW
62 Drinking water distillation systems
75 Non-potentially hazardous foods
170 Glossary of food equipment terminology
173 Dietary supplements
177 Shower filtration systHP V – AHWKHIF HIIHFW
184 Residential dishwashers
14159-1 Hygiene requirements for the design of meat and poultry processing equipment
14159-2 Hygiene requirements for the design of hand held tools used in meat and poultry processing
14159-3 Hygiene requirements for the design of mechanical belt conveyors used in meat and poultry processing

[25] The information contained in this Standards and Criteria page is not part of this American National Standard (ANS) DQG KDV QRWEHHQ SUHFHVHG LQ DFFRUGDQFH ZLWK A16,'V requirements for an ANS. As such, this Standards and Criteria page may contain material that has not been subjected to public review or a consensus process. In addition, it does not contain requirements necessary for conformance to the Standard.

***THE HOPE OF MANKIND** rests in the ability of man to define and seek out the environment which will permit him to live with fellow creatures of the earth, in health, in peace, and in mutual respect.*

Printed 8/8/05

Mr. ISSA. Thank you.

Doctor, you are next.

STATEMENT OF V. SRINI SRINIVASAN

Dr. SRINIVASAN. Good afternoon. Thank you, Mr. Chairman, Representative Waxman, and members of the committee. It is an honor to speak with you today. I am testifying today on behalf of the U.S. Pharmacopeia [USP], where I am vice president for Verification Program.

As part of our mission to promote public health, USP assesses the quality, purity, and potency of dietary supplements through its verification program. Under this voluntary program, manufactures may submit their supplements for testing, but only those products that meet all of USP's stringent criteria are allowed to use the distinctive USP verified mark in their labelling. Shoppers can use the USP verified mark to distinguish a supplement of high quality from a supplement of unknown quality.

The apparent finding of our mark reassure that the children will not be getting a dose of lead or mercury along with the vitamins. For example, the one that I have here, children's chewable vitamins, can be tested by anybody other than USP to find what I am saying is right or not.

Our mark tells consumers that the product they purchase has been examined and tested by a respected independent nonprofit body using rigorous scientific standards and that the product meets these standards. USP is uniquely qualified to conduct this verification program. USP has been setting standards for medicine products since 1820 and publishes these standards in the U.S. Pharmacopeia and National Formulary, which I am holding in my right hand here.

The current USP index contains more than 200 standards that apply to dietary supplements. These standards were established under USP's open, transparent, and participatory standard setting process. Both the Federal Food, Drugs, and Cosmetics Act and DSHEA recognize that the U.S. Pharmacopeia and the National Formulary and the official compendia and the standards for drugs and dietary supplements are enforceable by FDA. Under DSHEA, dietary supplements are only required to meet USP standards if the product claims to meet those standards. This is why the USP verified mark is so important.

The mark's presence on a supplement label helps to assure the consumer of five facts: That the labeling accurately describes the product's ingredients, that the product contains the stated amount of each ingredient, that the ingredients will release and dissolve properly so that they may be absorbed by the body, that the product does not contain dangerous levels of contaminants such as lead or pesticides or e. coli, and, finally, that the product has been manufactured properly, which means that the manufacturer must implement the good manufacturing practices or what you call commonly GMP that USP has established for dietary supplements and FDA's proposed GMPs.

Compliance with the GMP is the only way to prevent many of the problems that may occur during manufacturing, such as contamination, batch-to-batch inconsistencies, and unsanitary manu-

facturing facilities. Customers can be assured that USP will not allow the USP verified mark to be used on products that present clear safety concerns. The USP verification program will not even consider dietary supplements that contain ingredients such as Kava, which I am holding in my left hand, that we know to be unsafe even though they might be legally marked under the DSHEA regulations in this country.

Once the product is accepted for testing by USP, verification requires four steps: First, the product is tested in the lab to verify that it meets USP's standards. Second, the manufacturing documentation is reviewed to verify that the product meets specifications throughout the manufacturing process. Third, the manufacturing facilities are inspected for compliance with the USP GMP standard and with FDA's proposed GMPs. And fourth, if the product is awarded the right to use the USP verified mark, USP will periodically test off-the-shelf lots at random to confirm that they continue to meet the verification program's requirements. The manufacturing site is audited every 3 years, and during the intervening years, manufacturers conduct self-audits and report to USP.

When it has been necessary, all of the manufacturers we have worked with so far have chosen to improve the quality of the product processes in order to earn the mark. For instance, manufacturers have added tests for contaminants or added stability studies, reformulated products that failed to dissolve or that degrade over time, or change the product labeling to accurately list the ingredients and their quantities. More than 200 individual products have met the verification program's rigorous requirements and about 100 million bottles of USP verified supplements have reached store shelves across the country. By recognizing high quality supplements, the verification program is helping consumers to make educated and confident dietary supplement choices.

Finally, I would like to conclude by saying finding a good quality dietary supplement is as easy as finding one that contains the USP verified mark.

Thank you, Mr. Chairman, for the opportunity. I will be available for any questions.

[The prepared statement of Dr. Srinivasan follows:]

U.S. Pharmacopeia
The Standard of Quality℠

Testimony of V. Srini Srinivasan, Ph.D
Vice President, Verification Program
The United States Pharmacopeial Convention, Inc.

Before the U.S. House of Representatives
Committee on Government Reform

March 9, 2006

Mr. Chairman, Representative Waxman, and Members of the Committee, I thank you for the opportunity to tell you how the United States Pharmacopeia (USP) helps consumers select supplements they can trust. Briefly, USP tests dietary supplements and awards the distinctive USP Verified mark to products that pass our rigorous tests for quality, purity, and potency. That USP Verified mark, which is pictured in the appendix, appears on more than 200 vitamin, mineral, amino acid, and botanical products in stores across America today. Like the familiar UL mark from Underwriters Laboratory or the ADA Seal from the American Dental Association, the USP Verified mark assures consumers that a respected independent body has examined the product against pre-defined standards and has found that it passes those standards.

To determine whether a dietary supplement is entitled to display the USP Verified mark, USP's Verification Program for Dietary Supplements (the Verification Program) subjects manufacturers to a thorough and rigorous manufacturing facility audit and scientific review of their manufacturing and quality control processes. Their finished dietary supplement products are tested for conformity with the product's labeling.

Before describing USP's Verification Program and its benefits in detail, I will provide you with background information about USP, its standard-setting activities, and the recognition of USP standards under federal law. I also should inform you that I am appearing today on behalf of USP. My written disclosure pursuant to the "Truth in Testimony" rule is attached.

I. USP as a Standards-Setting Organization

USP, a not-for-profit, non-governmental organization, has been developing standards for medicinal products since 1820. Today, our standards apply to drugs, dietary supplements, biological products, and medical devices. As a core element of USP's mission to promote the public health, USP publishes these standards in the *United States Pharmacopeia* and *National Formulary*, published together as the *USP-NF*.

12601 Twinbrook Parkway
Rockville, MD 20852

301-881-0666
www.usp.org

USP's public standards, which define the analytical procedures that are necessary to identify and control the quality of compendial products, lead to improved consistency of products in the marketplace. This assurance of consistent quality allows healthcare providers and consumers to have increased confidence in their healthcare decisions. USP's public standards also allow manufacturers to use the best, most relevant, and science-based analytical procedures. *USP–NF* is updated continuously to ensure that the standards evolve with advances in science.

USP's standards are developed by experts in the field sitting on all-volunteer USP Expert Committees. Before becoming final, standards are available for public review and comment in the USP publication *Pharmacopeial Forum*. Ultimately, a USP Expert Committee determines whether a monograph will appear in the *USP-NF*. The combination of a body of experts and a public review process is designed to ensure the development of scientifically sound standards through an open, transparent and participatory process.

A. Standards for Dietary Supplements

Dietary supplement standards in the *USP-NF* usually are designed to ensure consistency of product, to eliminate foreign ingredients, and to provide reasonable certainty that the consumer is getting what he or she paid for. USP began acting on the public health need for standards for vitamins, minerals, and amino acid products in the late 1980s. USP's standards-setting for botanical products began after the passage of the Dietary Supplement Health and Education Act of 1994 (DSHEA). USP considers this activity a return to the organization's roots, as early volumes of the *USP* set standards for botanical products such as valerian, ginger, and chamomile.

Dietary supplement standards in the *USP-NF* appear either as an ingredient or product monograph or as a General Chapter.

1. Ingredient and Product Monographs

Ingredient monographs generally specify analytical methods that manufacturers must use for identification (to ensure that the product is what it says it is) and assay (to ensure that the product behaves chemically as it should). The analytical method set forth in the monograph may be adopted by manufacturers and regulatory bodies alike to ensure product quality.

The current *USP-NF* includes 66 monographs for botanical products such as echinacea, ginkgo biloba, garlic, and saw palmetto. It also includes 123 monographs for individual non-botanical dietary supplement ingredients (*e.g.*, vitamins and minerals) as well as class monographs for non-botanical dietary supplement products containing one or more ingredients. Class monographs provide general standards for over 850 vitamin and mineral products in the marketplace. They have been widely adopted by the dietary supplement industry and assure the quality of many dietary supplement products in the marketplace.

2. General Chapters

A procedure that is required by many individual product or ingredient monographs may be described in a stand-alone General Chapter. The individual monographs then may incorporate the General Chapter by reference. A number of *USP-NF* General Chapters apply to dietary supplements.

General Chapter <2750> Manufacturing Practices for Dietary Supplements, for instance, sets forth broad-based good manufacturing practices (GMPs). GMP compliance is critical to producing a high-quality product. The GMPs defined in the *USP*, which are based on drug manufacturing GMPs, are the most credible and stringent third-party GMP standards in the U.S.[1] Compliance with GMPs helps to prevent such problems as contamination, batch to batch product inconsistency, unsanitary manufacturing facilities, and errors in product labeling. GMPs also define requirements for documentation of manufacturing processes that can help manufacturers to track, identify, and solve manufacturing problems when they occur.

B. Legal Effect

The *USP* and *NF* are recognized as "official compendia" under the Federal Food, Drug, and Cosmetic Act. *USP-NF* standards are enforceable by FDA, and articles that fail to meet applicable standards are considered to be adulterated or misbranded under the law. USP itself does not enforce its standards.

Under DSHEA, in contrast, dietary supplements are required to meet *USP-NF* standards only if the product purports to meet those standards, *e.g.*, by including the designation "USP" in the ingredient name. A product may be misbranded under DSHEA if it claims to meet USP standards but in fact does not. Thus, while DSHEA also recognizes the *USP* and *NF* as official compendia, compliance with *USP-NF* standards, including GMPs, is entirely voluntary for dietary supplement manufacturers. And as is the case with drugs, USP's standards for dietary supplements are enforceable by FDA, not USP.

II. Verification Program for Dietary Supplements

After DSHEA became law, the number of dietary supplements available in the U.S. increased dramatically. Health care providers and pharmacists as well as consumers found it increasingly difficult to distinguish poor quality dietary supplements from those of higher quality. The need grew for clarity in the dietary supplement marketplace, but DSHEA does not provide any method for providing such clarity.

In response to the rising public health need, USP created a new program, separate from its standards-setting activities, to fill this gap in information: verification of the quality of dietary supplements through its voluntary Verification Program for Dietary Supplements. The Verification Program's uniqueness and value lie in USP's credibility and experience and in the rigorous testing program.

---

[1] The GMPs defined in *General Chapter <2750>* in fact are more stringent than the dietary supplement GMPs proposed by FDA in 2003.

Under the Verification Program, USP evaluates and verifies supplements according to stringent standards for product purity, accuracy of ingredient labeling, and proper manufacturing practices. Products that meet the program's rigorous requirements are awarded the right to use the USP Verified mark.

The USP Verified mark helps assure consumers, health care professionals, and supplement retailers that the product:

- Has labeling that is accurate;
- Contains the ingredients stated on the label in the designated amount or strength;
- Contains ingredients that will release and dissolve so that the body may absorb them;
- Meets requirements for limits on potential contaminants; and
- Has been manufactured properly by complying with USP and proposed FDA standards for GMPs.

A. Evaluation of Products in the Verification Program

USP evaluates dietary supplements submitted to the Verification Program through (1) extensive laboratory testing; (2) comprehensive review of quality control and manufacturing documentation; and (3) evaluation of manufacturer compliance with USP and proposed FDA standards for GMP.

First, the supplements are tested against USP established standards for purity and for ingredient content and performance characteristics, *e.g.*, dissolution and disintegration. This testing is performed by USP's laboratories and other third-party laboratories with demonstrated expertise in evaluating the complex composition of vitamin, mineral, and botanical compounds.

Second, the manufacturer's documentation of its quality control procedures is reviewed. This review examines the product's compliance with applicable specifications for dietary ingredients, excipients, packaging and labeling materials, and the finished product. The review also examines the testing method(s) and reference materials used by the manufacturer, to ensure that they are appropriate and acceptable; the product's stability data, to ensure that the product will retain its quality throughout its marketed shelf life period; and the manufacturing documentation, to verify that the master formula, manufacturing process directions, packaging instructions, product labeling, and indication of quality assurance final release approval are acceptable.

Third, the manufacturing facilities are inspected for compliance with USP and proposed FDA standards for GMPs. The GMP review is detailed, but GMP compliance generally assures that the manufacturing is subject to careful oversight, preventing intentional or unintentional contamination of the products with unwanted additives.

If a product meets the Verification Program criteria, the manufacturer is entitled to use the USP Verified mark on the product's labeling. Thereafter, USP periodically will test off-the-shelf lots of the product at random to ensure that they continue to meet the program's strict

standards. The manufacturing sites will be audited for GMP compliance on a three-year basis, with manufacturers required to conduct annual self-audits during the intervening years and report the results to USP for review.

B. Verification Program Experience and Supplement Issues Resolved

USP's Verification Program has had a clear and positive impact on the dietary supplement marketplace. We have verified more than 200 different products. Since the first USP Verified product reached store shelves in 2003, about 100 million bottles of dietary supplements bearing the USP Verified mark have become available in pharmacies and grocery stores nationwide. Our program has been applauded in the press, as the quotes in Appendix B illustrate. And consumer awareness continues to grow: The Healthbeat Interactive Survey conducted by the Natural Marketing Institute in September 2005 found that 25 million consumers recognize the mark.

The Verification Program provides a very real benefit for consumers. Consumers who purchase a dietary supplement product bearing the USP Verified mark can be assured that the product:

- Does not contain dietary ingredients other than those stated on the label;
- Does not contain mislabeled or potentially harmful amounts of supplement ingredients;
- Does not contain dangerous levels of contaminants; and
- Was manufactured using sanitary and well-controlled procedures.

Moreover, dietary supplement products will not be considered for the Verification Program if they contain ingredients with safety concerns, even though they may be legally marketed under DSHEA. Products that USP has refused to verify include gingko containing vinpocetine, ephedra, kava kava, comfry, and chaparral.

The Verification Program also has had a significant impact on the quality systems and manufacturing practices of participating companies. In order to meet the Verification Program standards, participating manufacturers have undertaken the following, among other actions:

- Additional testing for undesirable contaminants;
- Reformulation of products that fail to dissolve;
- Reformulation to ensure that the formulation provides 100% of label claim throughout the product's shelf life;
- Characterization and quantification of botanical marker compounds;
- Implementation of stability study protocols to establish appropriate expiration dating; and
- Labeling changes to ensure an accurate list and appropriate quantitative claims for the ingredients.

These measures have further improved the quality of dietary supplements in the marketplace, and have resulted in consumers receiving more accurate information about their supplements.

III. Conclusion

Since 1820, USP staff and volunteers have dedicated themselves to protecting and promoting public health. USP's Verification Program fills a void in the federal regulation of dietary supplements created by DSHEA and helps consumers make educated and confident dietary supplement choices in the marketplace. USP will continue to encourage dietary supplement manufacturers to take steps to assure that their products are high quality and consistent with their labeling. In the interest of public health, we also encourage manufacturers of all types of dietary supplements to submit their products to the USP Verification Program for stringent and scientifically sound third-party verification.

Appendix A:
"USP Verified" Mark

Appendix B

- *Wall Street Journal* calls USP's "the most rigorous of the seals programs." (7/10/02)
- *Los Angeles Times* states that "the most extensive independent testing is being offered by U.S. Pharmacopeia." (2/18/02)
- *New York Times* says that "United States Pharmacopeia is the best known of the three certifiers, setting standards recognized by the Food and Drug Administration for 180 years." (1/2/02)
- *San Diego Union Tribune* says that "USP is the gold standard in dietary supplement verification." (7/15/02)
- *Prevention Magazine* says that the USP program is "a huge step in the right direction." (November 2002)
- *Pharmacy Times* states "Given the criteria established by USP for evaluating a product's worthiness to be awarded the DSVP symbol, pharmacists and patients can now to some extent be reassured as to the integrity of many dietary supplements. Notably, any product bearing the DSVP symbol meets both USP standards for inclusion in the National Formulary and established safety standards." (April, 2003)

Truth in Testimony Disclosure

Government grants, subgrants, and contracts awarded to V. Srini Srinavasan personally in the current or past 2 fiscal years: None

Non-governmental entity being represented: The United States Pharmacopeial Convention, Inc.

Government grants, subgrants, and contracts awarded to the represented entity in the current or past 2 fiscal years:

FY04

Agency	Program	Amount
United States Agency for International Development	Drug Quality and Information Project	$1,881,080
National Institute of Child Health and Human Development	Drugs without pediatric labeling review	$54,990

FY05

Agency	Program	Amount
United States Agency for International Development	Drug Quality and Information Project	$2,280,429
Centers for Medicare and Medicaid Services	Development of Drug Classes and Categories in Part D	$1,150,442

FY06 to date (Current)

Agency	Program	Amount
United States Agency for International Development	Drug Quality and Information Project	$1,826,211
Centers for Medicare and Medicaid Services	Medicare Part D (subcontract)	$44,121

Mr. ISSA. Thank you and thank you for bringing the giant economy size that we can easily view from a distance.

Dr. Cooperman.

STATEMENT OF TOD COOPERMAN

Dr. COOPERMAN. Thank you. Thank you, Mr. Chairman and members of the committee. I am Dr. Tod Cooperman, president of Consumerlab.com, a company which I founded in 1999 to help consumers identify better quality dietary supplements. I am accompanied by Dr. William Obermeyer, who was previously with the FDA for 9 years testing supplements and then helped me start Consumerlab.com in 1999. I appreciate the opportunity to share the results of our testing with over the last 6 years to provide insight into the issues that face consumers with dietary supplements.

Just a quick little background, Consumerlab.com tests products, primarily dietary supplements. We post the results on our Web site, which is very popular. We get over two and a quarter million visitors to that site a year, people looking for information on the quality of supplements. We have over 25,000 individual subscribers. Over 1.5 million individuals have access through their institutions, such as universities, public libraries, to our information. We also publish free summaries on our Web site and have our book as well in which we publish our reports for people who prefer that kind of access.

We also offer, actually, perhaps the oldest voluntary certification program of specific dietary supplements as well for manufacturers who voluntarily want products tested, although a majority of our testing is actually done on our nickel, picking products off the shelf and publishing the results. We received no government funding, but from time to time are hired by government researchers who are conducting clinical studies of dietary supplements and have asked us to check the quality of those products prior to the studies being conducted.

So I will share some of the general findings from our testing of approximately 1,000 supplements since 1999. What we have found is that one out of four supplements has a quality problem. The most common problem is a lack of ingredient in a supplement or a very poor quality ingredient in a supplement, a recent example being in a review of saw palmetto supplements which are used for men with prostate enlargement. We found the product which actually stated right on the label guaranteed potency, quality assured, yet it had less than half the amount of saw palmetto than it claimed to contain.

The next most common problem that we find is contamination with lead and other heavy metals and pesticides. Another recent example, we did a review of memory enhancement supplements, primarily ginko biloba, some other ingredients. We found one ginko supplement which contained 16 micrograms of lead in a daily serving, which is over 30 times the California limit for lead and actually would require, in California at least, a warning label on that product. No warning label was on that product. Actually, that is the highest we have ever seen, though we do find many products with lead contamination.

Other problems that we find supplements, we find products that are too hard to break apart in the body. We have actually had to use a hammer to break apart some of these supplements that we have encountered. They don't disintegrate properly. We have found fish oils and other oils that are rancid, spoiled, that you would not want to be taking. We found products with more ingredient than listed which poses a potential for toxicity as well.

We also identify in our reports, our Web site, our book problems where the product actually contains the right ingredients, but has potential problems such as extensive amounts of caffeine, as mentioned earlier, or combinations of caffeine with other stimulants such as synephrine from bitter orange.

For your interest, herbals and multivitamins actually tend to have more problems than single minerals and vitamin products. We find problems with products from every size manufacturer. Supplements that are very popular and new, we also find a higher percentage of problems with, probably because manufacturers are rushing to the market to get a product out there and using materials that may not be high quality.

Why do these problems exist? First of all, some manufacturers do not regularly check the quality of the raw ingredients that come in the door. They rely on uncertified certificates of analysis, and many also aren't checking the quality of products as they go out the door. Few manufacturers withdraw products from the market even if they know there is a problem with the product, and when they do, the recalls are often quiet recalls where only retailers are informed and consumers are not.

Manufacturers are not required to meet specific standards for ingredient quality identity or dosage. It is really up to the manufacturer to determine if they want to put in the dose that is needed to be effective or even to use the quality of ingredient that is needed to be effective. Our reports educate consumers as to which products have the right ingredients and the right dosage.

The Federal Government has not established standards of purity. We must turn to States like California to look for standards for things like purity from lead. There is a lack of FDA enforcement from our perspective in terms of all the reports that we have put out and others have put out of finding problems, but we have not really seen any type of FDA followup on those issues. Obviously, as mentioned earlier, good manufacturing practices still have not been established by the FDA. There are issues with uniformity and labeling so that people can compare apples to apples when looking at supplements. Warning labels are still voluntary, and we now know through the Institute of Medicine that there can be too much of a vitamin or mineral yet no warning labels are required when exceeding those levels. The adverse event reports are not required, and I know that is an issue of great discretion.

Even the daily value, the D.V. information, on the back of a supplement bottle where it says 100 percent of Vitamin A, those numbers have not been updated since 1968. A lot of those numbers have changed. In fact, my own children when very young, I would give them only half a child's vitamin because the amount of the Vitamin A in those products is actually excessive for a young child. You wouldn't know it from the labeling.

Finally, the quality of supplements in government-funded studies isn't always evaluated ahead of time. It is happening more and more, thankfully, but that should be determined ahead of time to know that if a product is going to be studied in clinical trials, it is the right product and the right quality, and I would be happy to answer any questions you have.

[The prepared statement of Dr. Cooperman follows:]

ConsumerLab.com, LLC
333 Mamaroneck Avenue • White Plains, NY 10605
Phone: 914-722-9149 Fax 914-721-6096
e-mail info@consumerlab.com
Web site www.consumerlab.com

Testimony of Tod Cooperman, MD, President, ConsumerLab.com to Committee on Government Reform – Subcommittee on Dietary Supplements
March 9, 2006

Dear Congressman Davis and Members of the Committee,

I am the president of ConsumerLab.com, a company that I founded in 1999 to help consumers identify better quality health and nutrition products based on independent testing. I am accompanied by Dr. William Obermeyer, Vice President for Research, who, prior helping to found ConsumerLab.com spent 9 years at the FDA testing dietary supplements in the Center for Food Safety and Applied Nutrition.

I appreciate this opportunity to present an overview of ConsumerLab.com's findings in order to provide the Committee with insight into the issues that consumers face with dietary supplements.

ConsumerLab.com Background:
ConsumerLab.com's testing of products is funded primarily with revenue from our website (www.consumerlab.com) to which over 25,000 individuals subscribe ($27 per year) and to which over 1.5 million others have access through subscribing institutions, such as colleges and libraries. Free summaries of our reports are also available on our website which receives over 2 million visits per year. We also publish a book and offer a Voluntary Certification Program for manufacturers who wish to have products tested for a fee for certification purposes.

We receive no government funding but, from time to time, are hired by government-funded researchers to test the quality of supplements used in clinical trials.

General Findings from Supplement Testing:
Based on tests of nearly 1,000 dietary supplements selected and purchased by ConsumerLab.com (from approximately 300 different brands), we find:

- One out of four products has a quality problem.
  - The most common problem is a lack of ingredient or substandard ingredient. Example: Pills of a saw palmetto supplement (for prostate health) claiming to be "Guaranteed for Potency" and "Quality Assured" had less than half of the promised amount of saw palmetto.
  - The next most common problem is contamination with lead and other heavy metals and with pesticides. Example: A daily serving a ginkgo supplement (for memory) contained 16 micrograms of lead, far higher than 0.5 microgram limit set by the State of California for the sale without a lead warning.
  - Other problems:
    - Tablets that won't release their contents, i.e., disintegrate;
    - Oils (such as fish oil) that are rancid;
    - Products with *more* ingredient than listed, with the potential for toxicity.

- Herbals and multivitamins are more likely to have problems due to their complexity (about 40% have problems). Supplements made with popular, new ingredients also tend to have more problems, as demand exceeds supply and manufacturers turn to low-quality ingredient.
- Problems have been found in products from every size of manufacturer.

Why Problems Exist:

- **Some manufacturers do not regularly check the quality** of the ingredients used in their products and rely on unverified Certificates of Analysis, nor do they check the quality of finished products.
- **Few manufacturers withdraw products** from market after a problem is identified. When done, recalls are typically "quiet" – announced to retailers but not publicly to consumers.
- **Manufacturers are not required to meet specific standards for ingredient quality/identity, or dosage.** It is up to the manufacturer to use proper ingredients, as well as to suggest an appropriate dose.
- **The federal government has not established standards of *purity*.** We must turn to California, for example, for a limit on lead contamination in supplements.
- **Lack of FDA enforcement.** There is little pro-active monitoring of product quality and little follow-up on reported problems unless life-threatening.
- **Good manufacturing practices (GMPs) have still not been established by the FDA**, although promised for over 10 years. These, if enforced, can help insure batch-to- batch uniformity. (They will not, however, guarantee "good quality" products if they do not include appropriate standards for purity and ingredient identity.)

Other Issues of Concern for Consumers:

- **Uniform labeling** is needed so that consumers can compare products on an "apples to apples" basis. Example: the amount of active "glucosamine" in glucosamine *sulfate* (2KCl) is only about 70% of that in equal weight of glucosamine *hydrochloride (HCl)*. Both may work at the proper dose, but labels should include the amount of active ingredient.
- **Warning labels are voluntary**. Some products exceed tolerable levels of vitamins, minerals, and other ingredients without warning. There are medical uses that may require exceeding these levels, but side effect warnings could help consumers avoid potential problems. (Products that exceed these levels are noted in our reports.)
- **Adverse events reports (AERs) are not required from manufacturers to the government**. Those that are reported are not readily available to consumers or health care professionals.
- **Daily Value (DV) levels of nutrients have not been updated since 1968. As a result,** "Supplement Facts" on labels do not reflect the latest nutrient recommendations proposed by the Institute of Medicine. Children's vitamins, for example, contain far more vitamin A than currently recommended for younger children. Manufacturers understandably will not alter their formulations until the FDA acts, since consumers look for products that contain "100% of the DV."
- **The quality of supplements in government-funded clinical trials have not always been established**, making the results of such studies less meaningful. The NIH should require investigators analyze the quality of supplements prior to clinical study.

Mr. ISSA. Thank you.

We will now hear from Ms. Duncan.

STATEMENT OF JANELL MAYO DUNCAN

Ms. DUNCAN. Good afternoon, Mr. Chairman and members of the committee. I am Janell Mayo Duncan, senior counsel of Consumers Union, publisher of Consumer Reports magazine. Thank you for providing me the opportunity to come before you today to address the committee about a perspective on inadequate government authority and oversight of dietary supplements, the importance of information for consumers who choose to navigate the dietary supplement market, and the advice given by C.U. to help consumers make better educated decisions when purchasing dietary supplements.

DSHEA created serious regulatory loopholes that have opened the flood gates to thousands of untested dietary supplement products. Benefits and risks do not have to be established before these products are brought to market. Manufacturers are not required to disclose when new products cause harm, and the law requires FDA to first prove that a supplement creates a significant or unreasonable risk before it can demand its removal from the market.

Many dietary supplements, including most vitamins and minerals, taken within recommended limits are safe and can have important health benefits for consumers; however, there are a significant growing number of questionable products that likely would not be allowed on the market if they were subject to pre-market safety testing. Because there are no requirements that a dietary supplement be proven safe and effective before going on the market, it is very difficult for consumers to determine which products are safe and worth consuming and which are ineffective and/or dangerous.

Health providers and public health authorities typically receive little pre-market or post-market information about how dietary supplements may affect human health and interact with medicines that patients are already taking. In addition, consumers may experience safety problems with dietary supplements because of potential effects on existing health conditions such as diabetes, coronary problems, or hypertension.

In light of the inadequacy of regulatory oversight in this area, C.U. believes that changes must be made to DSHEA such as requiring an expert panel to review the safety of dietary supplement products on the market, requiring dietary supplement manufacturers to tell FDA when they become aware of serious adverse events associated with the use of their products, pre-market testing requirements for certain supplements, product ingredient registration, and risk labeling requirements. We support FDA's appeal of Utah District Court decision calling into question FDA's authority to ban products containing low doses of ephedra, and we strongly urge the FDA to finalize good manufacturing practice regulations to better ensure the quality of supplements on the market. We ask Members of Congress to make it a priority to provide the FDA with needed enhanced authority and adequate funding to achieve these goals.

What can private organizations offer consumers in the way of information education? Although Consumers Union and other private

organizations may provide testing to determine if certain product brands contain ingredients in amounts indicated on supplement labels or investigate risks and benefits relating to specific dietary supplement products already on the market, these activities cannot replace the need for FDA to have the authority and the resources it needs to protect consumers' interests. Private organizations such as C.U. have no ability to require dietary supplement manufacturers to submit adverse event reports, seize dangerous and adulterated supplements, or require companies to evaluate the risks and benefits of a product before it is brought to market.

Unlike modern pharmaceutical drugs that are virtually all produced and purified from chemicals in a factory, herbal medicines extracted from plants are notoriously difficult to standardize. Individual plants can vary greatly in their content of key chemicals and active chemicals. While labels of herbal medicines and other nutritional supplements list their ingredients, the lack of meaningful government regulation of these supplements means that consumers have virtually no protection against inaccurate labeling or substandard preparations. For these reasons, Consumer Reports has a program of testing ingredients of selected nutritional supplements.

C.R. works with labs that specialize in analyzing herbal products to test representative brands of a variety of alternative medicines. Our findings are published in Consumer Reports magazine and on Consumerreports.org. Excerpts are often published in the Consumer Reports on Health newsletter.

Until the law is substantially changed and the FDA is adequately funded, C.U. has advised consumers not to rely on the Federal Government to ensure dietary supplements are safe and effective. The following are some steps that we have given to our readers in print and on line to minimize their risks from the use of any supplements they decide to take: One, stay away from the 12 supplements identified in our May 2004 article that carry risks that in our view are unacceptable; tell your doctor about any supplements you are taking; stay away from supplements for weight control. They frequently contain several stimulants that have never been adequately tested separately, let alone in combinations; do your own research. Two Web sites that contain reliable information are the NIH and the Memorial Sloan-Kettering Cancer Center sites; watch for adverse events; let your doctor know if you experience anything worrisome after starting a supplement; and report serious adverse events to the FDA.

I thank the chairman and other members of the committee for the opportunity to testify. I look forward to answering any questions you may have.

[The prepared statement of Ms. Duncan follows:]

TESTIMONY OF

JANELL MAYO DUNCAN, SENIOR COUNSEL

CONSUMERS UNION OF U.S. INC.

On

"THE REGULATION OF DIETARY SUPPLEMENTS
A Review of Consumer Safeguards"

Before the

HOUSE COMMITTEE ON GOVERNMENT REFORM

March 9, 2006

Good morning Chairman Davis, Congressman Waxman and distinguished members of the Committee. I am Janell Mayo Duncan, Senior Counsel for Consumers Union (CU), publisher of *Consumer Reports®* magazine *(CR)*.[1] Thank you for providing me the opportunity to come before you today to address this Committee about our perspective on inadequate government authority over, and oversight of, dietary supplements; the importance of information for consumers who choose to navigate the dietary supplement market; and how consumers can make better educated decisions when purchasing dietary supplements.

The Dietary Supplement Health and Education Act of 1994 (DSHEA) created serious regulatory loopholes that have opened the floodgates to thousands of untested dietary supplement products. Benefits and risks do not have to be established before these products are brought to market, manufactures are not required to disclose when their products cause harm, and the law requires the FDA to first prove that a supplement creates "a significant or unreasonable risk," before it can demand its removal from the market. Many dietary supplements -- including most vitamins and minerals taken within recommended limits -- are safe, and can have important health benefits for consumers. However, there are a significant and growing number of questionable products that likely would not be allowed on the market if they were subject to pre-market safety testing. Because there are no requirements that a dietary supplement be proven safe and effective before going on the market, it is very difficult

[1] Consumers Union is a nonprofit membership organization chartered in 1936 under the laws of the State of New York to provide consumers with information, education and counsel about goods, services, health, and personal finance. Consumers Union's income is solely derived from the sale of *CR*, its other publications and from noncommercial contributions, grants and fees. In addition to reports on Consumers Union's own product testing, *CR* with approximately 4.5 million paid circulation, regularly carries articles on health, product safety, marketplace economics and legislative, judicial and regulatory actions that affect consumer welfare. Consumers Union's publications carry no advertising and receive no commercial support

for consumers to determine which products are safe and worth consuming, and which are ineffective and/or dangerous.

Health providers and public health authorities typically receive little pre-market or post-market information about how such products may affect human health, and interact with medicines that patients are already taking. In addition, consumers may experience safety problems with dietary supplements because of potential interactions with existing health conditions, such as diabetes, coronary problems or hypertension.

Over the last 10 years, FDA has typically relied on warnings and voluntary compliance to address supplement hazards, allowing many dangerous products to remain on the market. As explained in detail below, in light of the inadequacy of regulatory oversight in this area, CU believes that changes must be made to DSHEA, such as: (1) requiring an expert panel to review the safety of dietary supplement products on the market; (2) requiring dietary supplement manufacturers to tell the FDA when they become aware of serious adverse events associated with the use of their products; (3) pre-market testing requirements for certain categories of supplements; (4) product ingredient registration; and (5) risk-labeling requirements. We ask members of Congress to make it a priority to provide the FDA with needed enhanced authority and adequate funding to achieve these goals. In addition, we support the FDA in its appeal of the Utah District Court challenge to its authority to ban ephedra. We also urge you and your colleagues in Congress to eliminate any ambiguity and clarify that FDA has the authority to ban dangerous supplements such as ephedra.

What can private organizations offer consumers in the way of information and education? Although Consumers Union, and other private organizations may provide

testing to determine if certain product brands contain ingredients in amounts indicated on supplement labels, or investigate risks and benefits relating to specific dietary supplement products already on the market, these activities cannot replace the need for the FDA to have the authority and resources needed to protect consumers' interests. Private organizations, such as Consumers Union, have no ability to require dietary supplement manufacturers to submit adverse event reports; seize dangerous and adulterated supplements; or require companies to evaluate the risks and benefits of a product before it is brought to market.

Longstanding CU Concerns about Safety of Certain Supplements

In 1995, *Consumer Reports* magazine published a list of five supplements that, according to the FDA, can cause serious harm to consumers – ephedra, chaparral, comfrey, lobelia, and yohimbe. Ephedra was finally removed from the marketplace on April 12, 2004; many years after the FDA first received reports of serious consumer health problems, including more than 100 deaths and almost 17,000 adverse events (including heart attacks, strokes and seizures). The other four supplements are still being marketed and sold in retail stores and on the Internet.

May 2004 *CR* Article on the Dangerous Dirty Dozen Supplements

In May 2004, *Consumer Reports* published a list of 12 hazardous dietary supplements (including the four herbs named in the 1995 report) that are too dangerous to be on the market based on government warnings, adverse-event reports, and medical experts. These "dirty dozen" unsafe supplements, which *CR* purchased in stores and online, included: aristolochic acid, comfrey, androstenedione, chaparral,

germander, kava, bitter orange, organ/glandular extracts, pennyroyal oil, skullcap and yohimbe. Six of these products have been linked to cancer, kidney failure, liver disease, and even death. Despite this fact, with the exception of androstenedione, these supplements continue to be widely available to consumers in the United States on store shelves and online. The dangers associated with these supplements include the following:

- **Aristolochia:** A herb conclusively linked to kidney failure and cancer.
- **Yohimbe:** A sexual stimulant linked to heart and respiratory problems.
- **Chaparral, comfrey, germander, and kava:** All known or likely causes of liver failure.
  Bitter orange: Its ingredients have effects similar to the banned weight-loss supplement ephedra.

The potentially dangerous effects of most of these products have been known for more than a decade, and at least five of them are banned in Asia, Europe, or Canada.

How Many Other Dangerous Supplements Are On the Market?

In addition to the 12 supplements named in the May 2004 article, CU believes there likely are other dietary supplement products that pose unacceptable risks to consumers.

Three other ingredients of concern are:

- Colloidal silver. Long-term use of dietary supplements containing colloidal silver can lead to agyria, a condition that turns skin gray and/or blue. According to several experts and respected sources, in recent years silver-containing products have been marketed with unsubstantiated claims that they are effective against AIDS, cancer, and many other diseases and conditions;[2]

[2] For example, see "Rosemary's Story," by Rosemary Jacobs, available on the Web at: http://homepages.together.net/~rjstan/rose2.html

- Usnic acid. A supplement ingredient derived from lichens, may be highly toxic to the liver, and has been linked to reports of liver failure.[3] The FDA has issued warnings about products containing usnic acid; and

- Ginkgo biloba. A popular supplement taken to enhance memory taken by as many as 11 million Americans, may reduce platelets in the blood, and make it more difficult for the blood to clot. This can cause excessive bleeding, and in some cases, strokes. Because of the potential complications with surgical procedures, Dr. John Neeld, the president of American Society of Anesthesiologists, advises consumers to discontinue the use of herbal medicine at least 2 to 3 weeks prior to surgery.[4]

Given that there are currently 30,000 dietary supplement products on the market, and 1,000 new products entering the market each year, it is important for Congress and the FDA to take a broad view of supplement safety. While most supplements likely are safe, consumers face particular risks from certain herbs that are highly toxic, could alter effectiveness of prescription medications, or that contain untested steroid equivalents. Without additional resources and regulatory authority, it simply is not possible for FDA or anyone to know exactly how many more of these products pose serious hazards to consumers. The fact that we lack information on the full extent of dangers relating to dietary supplement is cause for serious concern.

Inadequate Regulatory Oversight

U.S. Food and Drug Administration

Over the years, consumers have come to rely on the FDA to ensure that products that appear on the shelves in their local retail store or pharmacy have been tested and are safe for their use. By exempting dietary supplements from most types of

[3] Grady, Denise. "Seeking to Fight Fat, She Lost Her Liver," The New York Times, March 4, 2003, p.1."
[4] American Society of Anesthesiologists, "Anesthesiologists Warn: If You're Taking Herbal Products, Tell Your Doctor Before Surgery," posted on the Web at http://www.asahq.org/patientEducation/herbal.htm.

oversight required for prescription and over-the-counter drugs, DSHEA has created a troubling and unexpected gap in consumer protection. The federal government's inability to act promptly on available signals of serious consumer health problems with a dietary supplement, such as ephedra, is very disturbing. Consumers expect the government to take an active role in ensuring that dietary supplements are safe and effective.

Many consumers are surprised to learn the government does not currently evaluate the safety of dietary supplements before they are sold.[5] In an October 2002 nationwide Harris Poll of 1,010 adults, 59 percent of respondents said they believed that supplements must be approved by a government agency before they can be sold to the public. Sixty-eight percent believed the government requires warning labels on supplements' potential side effects or dangers. Fifty-five percent thought supplement manufacturers cannot make safety claims without solid scientific support.

Unfortunately, the respondents in the poll were incorrect. Instead of being equipped to take swift action when the FDA believes that a supplement may be unreasonably harmful, this watchdog agency has been relegated instead mostly to highlighting dangerous supplements on its website. For example, supplements such as aristolochic acid, featured in the May 2004 *CR* article, are highlighted by the FDA on its website under "Warnings and Safety Information." We are concerned that the warnings and information contained in our report, and featured by the agency will not reach

[5] For example, see "Widespread Ignorance of Regulation and Labeling of Vitamins, Minerals and Food Supplements," *Health Care News*, Harris Interactive, December, 2002; and Blendon, R. et al., "Americans' Views on the Use and Regulation of Dietary Supplements," Arch. Intern. Med., Vol 161, March 26, 2001, p. 805-810.

enough unsuspecting consumers – some of whom may suffer serious harm or even death.

FDA's Failure to Finalize Good Manufacturing Practice (GMP) Regulations

CU is concerned that in an area in which the FDA has clear authority under DSHEA – to issue Good Manufacturing Practice Regulations – the Agency has failed to issue a final rule for almost ten years. This is an unconscionable delay. Under DSHEA, the FDA has the clear authority to issue GMPs for dietary supplements. FDA issued an Advance Notice of Proposed Rulemaking in 1997, and sent a proposed rule to OMB on November 8, 2000. On February 1, 2001, OMB returned the proposed rule to FDA – delaying publication. The FDA published proposed GMPs on March 13, 2003, and a final rule has yet to be issued. Until this proposed rule (describing conditions under which dietary supplements must be prepared, packed, and stored, and intended to ensure accurate labels and unadulterated dietary supplements) is finalized, dietary supplements must comply with food GMPs, which are primarily concerned with safety and sanitation rather than dietary supplement quality. Although the authority under DSHEA for the FDA to issue GMPs should require the issuance of GMPs more closely resembling those for non-prescription drugs (and require supplements to be manufactured to the same quality standards), we strongly urge the FDA to finalize these proposed regulations in order to set clear quality standard for dietary supplements.

Ephedra: Poster Child for Failed Policy

In February of 2003, the FDA published a final rule to ban dietary supplements containing ephedra. Prior to its action, the Agency had received almost 17,000 adverse event reports relating to the use of ephedra, including heart attacks, strokes, seizures and fatalities. The delay in removing products containing ephedra from the market occurred, in large measure, because the FDA currently bears the burden of showing that a dietary supplement is unsafe before it is able to halt its sale. At the same time, FDA is kept in the dark by manufacturers that are not required to inform FDA when they learn that their products have harmed, or even killed consumers.

We strongly support the FDA's action to ban ephedra. However, we believe that the dangers relating to the use of dietary supplements are not limited to ephedra. In the absence of sufficient FDA action, *CR* continues to strongly urge consumers to avoid all weight-loss and energy-boosting supplements, especially those that are now touted as "ephedra-free."

As reported in the January 2004 issue of *CR*, herbal supplements that are labeled 'ephedra-free' are not necessarily safer than ephedra. Many include similar central nervous stimulants, such as synephrine-containing bitter orange (citrus aurantium). Synephrine is not only structurally similar to ephedrine but also may affect the body in ways similar to ephedra. Because there is no required pre-market safety evaluation for those products, consumers have no assurance that the problems experienced by ephedra users will not continue with a switch to ephedra-free products. By the time we have sufficient information on potential hazards posed by bitter orange, many consumers may have experienced serious adverse health events, including

seizures or strokes. This clearly illustrates why the burden of proof for establishing that dietary supplements are safe and effective ought to be on the manufacturer – not on consumers, health professionals, consumer groups, or the government.

Of additional concern is the fact that these supplements may interact unfavorably with other medicines that consumers are taking. Unfortunately, not all consumers will receive our message, and may pay with their lives.

Utah District Court Ephedra Court Decision

CU is deeply concerned about an opinion issued by a Utah District Court in April 2005 allowing sales of products containing low doses of ephedra. We strongly support the FDA ban on ephedra on the grounds that it presents "an unreasonable risk of illness or injury." Unfortunately, the Court decided that the Agency: (1) was wrong to weigh the supplement's risks against its minimal benefits; and (2) presented insufficient evidence to ban low-dose ephedra products. The decision will allow the plaintiff manufacturer to market its dietary supplements containing ephedrine alkaloids of 10 mg or less per daily dose. The Court's interpretation of the DSHEA incorrectly calls into question the agency's implementation of the Act, including its ability to weigh the benefits against the risks of supplements—a core precept of FDA regulation.

We support the FDA's appeal of this decision, and recent enforcement actions taken against products containing ephedra.[6] We also have strongly urged the Agency

[6] At the request of the FDA, the U.S. Attorney's Office for the Northern District of Georgia recently filed a Complaint for Forfeiture against "Lipodrene," "Stimerex-ES," and "Betadrene" – dietary supplements manufactured, marketed, and distributed by Hi-Tech Pharmaceuticals – labeled as containing 25 mg of ephedrine alkaloids per tablet. The Complaint for Forfeiture also included the ephedrine alkaloid raw materials used to manufacture these dietary supplements. The U.S. Marshals Service began seizing these dietary supplements and ingredients located at Hi-Tech's facilities in Norcross, GA on February 24, 2006. See http://www.fda.gov/bbs/topics/NEWS/2006/NEW01325.html.

to ask Congress to clarify that DSHEA provides it with authority to ban dangerous products such as ephedra, and for new authority to mandate that dietary supplement manufacturers report all adverse events that may be related to the use of their products. The latter will help FDA gather the evidence it needs to demonstrate the risks of dangerous supplements and protect the consuming public.

Federal Trade Commission

We commend the work of the Federal Trade Commission (FTC) to combat false and deceptive practices on the part of companies that market dietary supplements without proper substantiation for claims made. However, we believe that improvements in FDA's authority (the agency with primary authority over these products under DSHEA) discussed in this testimony are of paramount importance, and will go a long way to protect consumers.

Nutritional Supplement Testing at *CR*: Independent, Unbiased Evaluations Offer Meager Protection against Unregulated Products

Unlike modern pharmaceutical drugs that are virtually all produced and purified from chemicals in a factory, herbal medicines—extracted from plants—are notoriously difficult to standardize. Individual plants can vary greatly in their content of key active chemicals. While the labels of herbal medicines and other nutritional supplements list their ingredients, the lack of meaningful government regulation of these products means that consumers have virtually no protection against inaccurate labeling or substandard preparations.

For these reasons, *CR* has a program of testing the ingredients of selected nutritional supplements. CR has, working with labs that specialize in analyzing herbal products, tested representative brands of a variety of alternative medicines. Our findings are published in *CR* magazine and on *ConsumerReports.org.* Excerpts are often published in the *CR on Health* newsletter.

CR purchases samples in several locations, and publishes the brand names of products that pass or fail our test standards or other widely accepted standards. In analyzing nutritional supplements, *CR* follows our usual rigorous testing methods, described below:

How We Choose Brands to Test

For each supplement type, we conduct a market survey and choose a sample of the most widely available brands to test. Current market surveys are done for brands available on the Internet as well as those in stores.

How We Acquire Samples

We order on the Internet, and send shoppers to purchase samples at a variety of outlets in different parts of the country to assure that the products we test are truly representative of what is available to consumers nationwide.

How We Test

The samples of nutritional supplements purchased by our shoppers are prepared in "blinded" sample containers so that the testers are not aware of which brand(s) they are testing. We sample from several production lots of each brand in order to account for any variability of products, and for production quality control problems. We only test samples that are well within the "use by" or "sell by" date indicated on the label. When

available, official methods are used for all analyses. When no official method exists, our experts use an appropriate testing method based on sound science and/or acceptable industry practice. Analyses are carried out under well-established quality assurance and quality control measures.

What We Test For

Whenever the "active" ingredient in a nutritional supplement is known, we test specifically for that ingredient with the dosage proven in clinical trials as effective. In analyzing saw palmetto, for example, we targeted the amount of extract specific to the herbal rather than the total amount of fatty acids which can come from extraneous ingredients.

How We Report Our Results

CR reports the results for all brands tested: those that fulfill their labeling promise and those that do not. We present our findings in practical ways, indicating how much it would cost a consumer to take each supplement brand in a dosage that has been shown to be effective in randomized controlled clinical trials. *CR* examines product labels for ambiguity and for outright mislabeling and reports on these findings.

How We Arrive at Our Recommendations

Who might benefit from taking a particular supplement? What dosage should they take? Which side effects and drug interactions should consumers watch for? CU's experts evaluate the clinical evidence regarding the nutritional supplement, and help our readers understand what is known and unknown about various products. Thus far *CR* has published its findings on products including the following: Bitter Orange (January 2004); Hoodia (March 2006); Multivitamins (and concerns with dollar store vitamins)

(February 2006); Probiotics (July 2005); Calcium (January 2005); Soy (July 2004); Echinacea (February 2004); Omega-3 Oil (July 2003); Kava (March 2003); Glucosamine and Chondroitin (January 2002); Kava, SAM-e, and St. John's Wort (December 2000); Saw Palmetto (September 2000); Echinacea and Ginkgo Biloba (March 1999 CR); Ginseng (November 1995). *CR* also conducted surveys on supplements and other alternative treatments in August 2005 and May 2000.

CU Recommendations to Consumers in Light of Limited Regulation and Information

Until the law is substantially changed and the FDA is adequately funded, CU has advised consumers not to rely on the federal government to ensure that dietary supplements are safe and effective. The following are some steps we have given to our readers (in print an online) to minimize their risk from any supplements they decide to take:

1. **Stay away from the dirty dozen.** All carry risks that in our view are unacceptable. In combination products, consumers need to read the detailed list in the tiny print on the back to determine (assuming labels are accurate) exactly which ingredients are included.

2. **Do not take daily doses of vitamins and minerals that exceed the safe upper limits.** While vitamins and minerals are by far the safest and best-studied of supplements, it is possible to overdose on some of them. For more information, consumers can refer to CR's October 2003 report on fortified foods (available to subscribers). Recommended allowances and safe upper limits also can be found online at *www.ific.org/publications/other/driupdateom.cfm*.

3. **Limit your intake of other supplements.** Over the years, CU's medical and nutritional consultants have identified and tested a few products, other than standard multivitamins, with possible benefits and sufficiently low risks to recommend for general use, including: saw palmetto for benign enlarged prostate in men, glucosamine and chondroitin for arthritis, and fish-oil capsules (omega-3 fatty acids) for heart disease.

4. **Tell your doctor about your supplements.** Arthur Grollman, M.D., professor of pharmacological sciences at the State University of New York, Stony Brook has said "[t]he Achilles' heel of unregulated supplements is the risk created by herb-prescription drug interactions." He said, "St. John's wort, used to treat depression, for instance, may reduce the effectiveness of prescription drugs used by millions of Americans for hypertension, AIDS, heart failure, asthma, and other chronic diseases."

5. **Stay away from supplements for weight control.** These products frequently contain several stimulants that have never been adequately tested separately, let alone in combinations.

6. **Do your own research.** Health-food-store clerks and marketers, alternative-medicine practitioners, herbal company web sites, and even physicians are not necessarily knowledgeable about the scientific evidence regarding dietary supplements. However, two Web sites that contain reliable information are: the National Institutes of Health site at *ods.od.nih.gov/databases/ibids.html* and Memorial Sloan-Kettering Cancer Center's site at *www.mskcc.org/mskcc/html/11570.cfm*.

7. **Watch for adverse events.** Let your doctor know if you experience anything worrisome after starting a supplement. If your doctor concludes that the side effect may be related to the supplement, be sure to report it to the FDA, by calling 800-332-1088 or by visiting *www.fda.gov/medwatch*.

CU Recommendations for Legislative and Regulatory Change

CU believes that important consumer protection functions in this area must be undertaken by the government. Changes must be made to DSHEA in order to prevent additional deaths and serious injuries caused by dietary supplements.

We urge you and your colleagues in Congress to make it a priority to provide the FDA with enhanced authority and funding to act quickly when it receives reports regarding unsafe supplements. We believe that dietary supplement manufacturers must be required to submit adverse event information to the FDA. Finally, the federal government should not permit dietary supplements (especially stimulants and

supplements intended for use by children, pregnant women, the elderly, and other vulnerable populations) to be sold without adequate pre-market safety testing.

* * *

I thank the Chairman, Congressman Waxman, and the Committee for the opportunity to testify, and I look forward to any questions you may have.

Mr. ISSA. Thank you.

It is unfortunate, I think, that some of the government officials we had on the first panel have departed, but I can assure you that some of their staff remain.

I will lead off the questioning and start with Ms. Duncan. You referred to your 1984—2004, May—you can see my age. What brand of ginko biloba should I not use? I have to get the good stuff here. [Laughter.]

But your May 2004, and it is interesting reading because you put it in definitely hazardous, very likely hazardous, likely hazardous. These are pretty clear warnings, particularly for the definitely hazardous. What action have you seen coming out of oversight or out of FDA and so on as a result? As far as we know, all these substances are still on the market. Is that correct?

Ms. DUNCAN. All except for one. The Andro, the steroid, it can no longer be legally marked because it is a steroid.

Mr. ISSA. That was one level down. That wasn't the worst.

Ms. DUNCAN. That is true. The others that are listed are still on the market, yes.

Mr. ISSA. So the first item, which I am just going to the dangers, potent human caligen, kidney failure, sometimes requiring transplants and death reported. That is pretty scary stuff. To say that if this were any regulated drug, wouldn't it have either been removed or there would have been additional warnings that would be required before you could even administer it?

Ms. DUNCAN. Well, certainly if it were a drug, it would have been evaluated and people would know that it would actually be effective for whatever disease or condition they are taking it for, and so that is not the case for these products. So without a showing of efficacy, these products are way too dangerous for consumers to really—we recommend that consumers don't take them.

Mr. ISSA. Now, this has been banned in seven European countries and Egypt, Japan, and Venezuela. So I guess we are on the trailing edge of Japan, Venezuela, and Egypt particularly, but to the best of your knowledge, are there any warnings on this product today that reflect the deaths and kidney failure?

Ms. DUNCAN. Well, today, I am not exactly aware of exactly what warnings might be on these.

Mr. ISSA. Let us just say the last time you checked post-2004.

Ms. DUNCAN. I believe that there were no warnings of these particular issues on the products when we took a look at them. However, I could have our editorial people take a look back and see.

Mr. ISSA. I would appreciate it. I think to complete the record, it would be good to know if any of these substances or for each of them, if to the best of your discovery, there have been any voluntary changes by an industry that often claims that it tries to voluntarily do a good job. It doesn't appear as though death not being mentioned as a by-product is something that one would want to have not on there.

One issue, and I think this is primarily for Ms. Jordan and Dr. Srinivasan, sometimes professional athletes or amateur athletes test positive for banned substances. They claim it is a result of tainted supplements. While that may sound unbelievable, in fact, in California, it did happen when a competitive swimmer tested

positive for steroids. He claimed it was as a result of contaminated multivitamins, the most commonly taken supplement. He had a private lab test these supplements. They came back positive, and then the Washington Post apparently bought five dietary supplements over the Internet. All tested positive for steroids.

Do you have any sense of how—I mean, this is anecdotal information, but you are in the business of looking more deeply, testing more substances. I know Dr. Cooperman talked in terms of one out of four. What has been your finding along these lines?

Ms. JORDAN. Well, first of all, if the product had been NSP certified with our certified for sport mark, we would have clearly tested that product for banned substances. So that would have been included in the testing. We would have audited the manufacturing facility. We would have reviewed the formulation. We would also have audited some of the ingredient suppliers. So we would have followed the product from the source of the ingredients all the way to that product getting on the shelf, and we have all kinds of controls in place to make sure that product is not adulterated; however, that program wasn't available at the time. So an athlete took a supplement. He didn't know what was in the product, apparently, by the findings.

In the future, we have this new program that will allow athletes to make informed decisions when purchasing dietary supplements, and that should solve a lot of these problems.

Mr. ISSA. Dr. Srinivasan.

Dr. SRINIVASAN. Mr. Chairman so far, such sports nutritional, so-called sports nutritional products have not yet been submitted to our program. If they are submitted, they will have to go through our USP expert committee, who are volunteers from various scientific institutions, including some government agencies. If they determine that they are not safe, they will not bear the particular program mark. In our program, so far we have never come across such noxious adulterants in the product.

Thank you.

Mr. ISSA. Dr. Cooperman, did you want to elaborate on your testing results?

Dr. COOPERMAN. Actually, Dr. Obermeyer was a witness, actually, in that case in California, and he was just informing me that in that situation, actually, there may have been residue within the manufacturing plant where they were making products that contained banned substances in the same place where they were manufacturing products that shouldn't. That was what we were discussing.

Mr. ISSA. I see. So essentially, going back to earlier, if you were inspecting the facilities, if they were ISO 9000 and blank, whatever is appropriate for that industry, this shouldn't have happened, but if this was something that came out of a facility that was otherwise legal, was that a facility that manufactures, if you will, compliant products as far as you know? Do you know anything more about the manufacturer?

Dr. COOPERMAN. Can you restate the question?

Mr. ISSA. I guess the question is that, well, it shouldn't have happened if it came out of a certified facility. To the best of your knowledge, did it come out of a facility that produced certified

product? My understanding is there are very few facilities and a whole lot of marketers, and so they are subcontractors very often, and I think that is one of the big concerns.

While he is getting an answer, yes, Ms. Jordan.

Ms. JORDAN. I would like to address that. In our particular program, if a manufacturer uses a contract manufacturer or ingredient that is in that product from a facility that sources, manufacturers, or distributes or warehouses any substance on the World Anti-Doping Agency banned list, the NFL list, or the MLB list, they are automatically excluded from participation. We must control them, any possible cross-contamination issue, and that is what the program is all about. That is why I said it starts from the source all the way through the finished product, is having those controls in place so no substance can get in there in the first place.

Dr. SRINIVASAN. Mr. Chairman, I would like to add to that. If a facility is in conformity with the Good Manufacturing Practices guidelines, it is very unlikely such manufacturers will resort to deliberate adulteration with such noxious compounds. So compliance with the GMP is where we start first, make sure that all the documents that are involved in the manufacturing processes are all reviewed prior to even testing. We don't even admit manufacturers without even going through the pre-audit documentation, which was the ethics of the company.

So in my personal opinion, the GMP compliance is the most important thing that we can hope to control this industry with.

Mr. ISSA. Excellent. Thank you.

Dr. SRINIVASAN. Thank you.

Mr. ISSA. Mrs. Davis.

Mrs. DAVIS OF CALIFORNIA. Thank you very much, Mr. Chairman. I appreciate your questions, and all of you, thank you very much for your testimony.

I wonder if you could address the issue of getting back to that link between the consumer who believes that, through the proposal I have seen or the questionnaires, that something is natural, that it is safe, that it has been tested, and then whether it has a USP label or whatever it has, getting that information back to the consumers who have had difficulties with the product, how do you see that? What do you think is appropriate? If you have a USP label, do people actually contact you, contact USP, at all? Do they contact NSP? What is your feedback loop?

Dr. SRINIVASAN. Yes. The law of the land clearly says if the product, if the manufacturer determines that the product that he is labeling is in conformity with this USP book here, then he is entitled to use the letters U-S-P. Now, products that are labeled as USP are supposed to be in conformity with what the book says, but prior to this program that we launched in 2002, we had enumerable complaints from various manufacturers saying that products that are labeled as USP are not, in fact, in conformity with USP. In fact, Consumer Reports ran a story a few years ago. Some of the products that they tested, labeled as USP, did not conform to it.

Now, that led us to this voluntary program, verification program, in which manufacturers participate voluntarily now. Now, willing companies or consumers who purchase a product with just, simply say, Vitamin C tablets, contact USP. Yes. We do have such inquir-

ies from consumers. I cannot name the official, but a high-ranking official called the CDC, contacted me to ask me if a product that he bought, glucosamine chondroitin sulfate, USP, is it in conformity with the USP, have you tested the product. I answered no. If it doesn't contain the USP verified mark, that means that I have nothing to do with that. The manufacturer has determined a self-certification.

Now, he wanted to know how do I know that it is in conformity with the USP. You take it to a testing lab. That testing lab will charge a $7,500 to test the product. He bought this for $15. He said forget it; I am not going to get it tested.

So you see there is a problem here. So just by going to the USP letters or not, some companies may not assure the consumers what they really are marketing.

Mrs. DAVIS OF CALIFORNIA. Did you want to add something?

Dr. COOPERMAN. Yes. We are contacted by consumers constantly. How we handle that is people suggest there might be an issue with a product. We will typically include that product in our next round of testing in that category of products. It is all based on information right now. Consumers have to educate themselves using the resources that are out there. I don't think they can rely, as we were saying here, on the quality of supplements right now on the market.

Mrs. DAVIS OF CALIFORNIA. Could you comment, obviously, this is sort of proprietary on my part, but I am really interested in knowing what you think about trying to find that balance between consumers having access to products and also being aware of whether or not they are safe. Do you believe that adverse event reporting through the FDA is an appropriate way to go? What else would you suggest?

Dr. COOPERMAN. Personally, I think everyone in our company feels that it is a very important piece, reporting that information. In fact, when we started in the late nineties, you actually could go on line and get that information through the Med Watch program, and then all of a sudden it stopped. It seems like if it is handled in the right way, that is a critical component and should certainly be in effect again.

Mrs. DAVIS OF CALIFORNIA. Yes, Ms. Duncan.

Ms. DUNCAN. Well, yes. The questions having to do with adverse event reports and manufacturing practices, what we would like to see is something that is not just a voluntary system, one that is mandatory. I mean, there is really not enough results. There is not enough deterrence for companies to fail to follow good manufacturing practices, and right now, they are not finalized. So there is really not a baseline for the FDA to take and for companies to look at to know there are good actors and there are bad actors so that we need to bring bad actors up to the same standards and have their products subject to seizure if they are not following the final rules when they are issued.

As for adverse event reports, there is talk about consumers contacting consumer labs and contacting USP when they are having problems. Well, FDA, it needs to be mandatory for companies to report problems with products to FDA, because these reports are not necessarily reaching FDA. There are about 15,000 reports of

Metabolife, problems with ephedra that never reached the FDA. These concerns go to the poison control centers and stay there.

So we need to have all of this information be forwarded to the FDA so they can take action when there is a problem.

Mrs. DAVIS OF CALIFORNIA. Ms. Jordan, did you want to comment?

Ms. JORDAN. Yes. I wanted to comment on the previous question about how do consumers know if a product is good quality and if it is safe, and I said earlier in my testimony that we have toxicologists at NSF that specialize in this field, and they review every formulation and every label for compliance with Federal regulations. So that is one of the aspects of safety, and once a product is in its manufacturing facility and is in 100 percent compliance with all of our requirements, it goes into a listing. We have free product listings and we get millions of hits to our Web site every year from consumers and retailers and health care practitioners looking for certified products across all the areas in which we certify, whether it be water or food or dietary supplements, and that mark also appears on the label. It is a very well-known mark. That NSF mark appears in 80 countries. It is a round blue mark with NSF in the middle, and for dietary supplements, it says the contents have been tested and certified, and for banned substances, it says certified for sport. On our Web site, it is listed right under that so consumers know exactly where to go.

Then once they get to our Web site or to our consumers affairs office, we offer free consumer fact kits that help consumers figure out how to decipher dietary supplement labels, what does third-party certification mean.

Mrs. DAVIS OF CALIFORNIA. I know, Mr. Chairman, my time is up, but how does the consumer grapple with the drug interactions with that? I mean, the product in and of itself may be safe or have been tested, but how do the labels——

Ms. JORDAN. Exactly. We actually have a statement on our Web site that refers to them. I don't have exactly the wording, but it says you should consult with your health care provider when taking dietary supplements. So we feel that if a consumer has a health problem or they are taking a prescription or over the counter drug, they should consult with their health care practitioner in deciding whether or not they should take a dietary supplement.

Mrs. DAVIS OF CALIFORNIA. Thank you. I appreciate that. I think that what is difficult is that people read that and they don't necessarily think that it applies to them, and for so many of the supplements, I think there are some warnings on the labels, but nevertheless, we know that there are thousands and thousands of people that still take them even though they may be aware of some difficulty.

Dr. COOPERMAN. Actually in our reports, if you are looking at ginko or whatever——

Mr. ISSA. I said I should be looking at it.

Dr. COOPERMAN. We do provide that information on drug interactions and really take the consumer through the process of should you even consider using this product and, if so, what are the pros and cons, dosage, etc., and that information is out there, but people have to search for it or subscribe to places that provide it.

Ms. JORDAN. Can I just add to that? I am a registered dietitian and a member of the American Dietetic Association, and in my years of clinical practice, we worked very closely with patients about issues of drug interactions. There are some very good publications. You can get information from Eatright.org, which is the American Dietetic Association Web site which does help consumers with those types of issues as well.

Mrs. DAVIS OF CALIFORNIA. I appreciate that, and then question, I don't know whether you want to deal with just the efficacy, and I think that you mentioned you can't really deal with that directly, but how can we do that?

Ms. JORDAN. We need to continue to support the NIH and the centers that are doing this research to determine whether or not these products are safe and efficacious.

Dr. COOPERMAN. I would like to add to that. However, even if we know that a product is effective, we still find frequently a manufacturer that will make a product that doesn't have the effective dose. Let us say that it has one-tenth of the effective dose. There is no way a consumer will know that it is not the effective dose unless they have researched it. So I certainly support all the clinical research that is going on, but it is either consumers have to educate themselves or standards have to be set as to what constitutes a product that is being sold to maintain memory or whatever the indication is.

Mrs. DAVIS OF CALIFORNIA. The chairman and I will have to work on that one. I appreciate your testimony.

Thank you, Mr. Chairman.

Mr. ISSA. Thank you for your questions. You have added a great deal to this panel. Thanks for attending.

A couple more followup questions, and, Ms. Duncan, I want to put you on the spot one more time. In your written statement, you highlighted that Consumer Reports published its findings about multivitamins. You will notice I am harping on multivitamins because it is what everyone seems to take before we even look at all the rest.

In concern with Dollar Store vitamins, can you tell us what the findings were, as I believe the majority of consumers probably believe, that multivitamins are safe across the board? It is the one that no one seems to be concerned about. Can you talk in terms of what you found, if you will, the differences in multivitamins and how they might, in fact, be in or outside the realm of safe? And I know Dr. Cooperman may have a followup on that.

Ms. DUNCAN. I know that our findings did find different levels of the purported ingredients in the vitamins that we took a look at. Let us see. We generally found that they were beneficial for certain groups who have special nutritional requirements, like women or people with gastrointestinal disorders, strict vegetarians, and those on restricted diets, and we concluded that you can generally rely on major brand names and store brand vitamins, and that is what we found in our past tests.

In terms of the things that we found at Dollar Stores, well, I can submit for the record this article and the chart that we have in terms of where these products were purchased and what the actual level of the vitamins were and what the claims were for the vita-

mins. We did find that there was a difference in nearly half of the 18 tested brands failed to contain the labeled amount of at least one nutrient and several did not dissolve adequately.

So we did find differences in the different types of vitamins.

Mr. ISSA. Thank you. That was what I was hoping to get into the record, is, if you will, the pervasiveness of that problem even at a national chain.

Dr. Cooperman, did you want to add something?

Dr. COOPERMAN. Yes. Thank you. We have a massive review of multivitamins over 2.5 years. We found problems with over 30 percent of multivitamins. So they are certainly not immune. It is particularly of concern when you are dealing with, say, a prenatal multivitamin where you are expecting to get a certain amount of folic acid to prevent birth defects, and we have found products that don't have all the folic acid that they claim. In fact, when my own wife has been pregnant, I have had her take two different multivitamins just to kind of hedge her bets, and I know which ones are good.

So there is concern even with multivitamins.

Mr. ISSA. Moving to another area, this committee has been particularly active, I would say stimulated the changes in professional sports. Ms. Jordan, I note that the Major League Baseball just practically overnight, I guess it has been in the last week, has signed on to your program. Can you give us a little bit of an update of how that came to happen and what went into it and what you hope to achieve?

Ms. JORDAN. We got involved in the area of sports nutrition and the issues of adulteration in sports supplements when I got into a discussion with a dietitian that was working with amateur and professional athletes who then referred us to the NFL because the NFL-NFL PA was struggling with this very issue. They did a survey. They found that most of the players were taking supplements. They found out what types of supplements. They had the steroid policy. They test their players for steroids on a regular basis, but they didn't have any controls in place or any advice to give the players as to which supplements to take.

So they partnered with NSF to solve that problem. We helped them design a program and now we administer it. So in the locker rooms, the players have products that are NSF certified where we test every single lot for banned substances in addition to making sure that the product contains exactly what the label claims in terms of identity and quantity and it doesn't have the other typical contaminants.

In addition, then following that, we announced that program with NFL-NFL PA at SuperBowl 38. We started to get a lot of inquiries from manufacturers and other sports organizations about that program, but there was a request that expanded the program to address all sports, and then I got invited by the World Anti-Doping Agency to participate in their committee to address this very issue. So I have been going around the globe with them on that, and really ultimately what will happen is there will probably be an international standard and it will probably be modeled after the one that we currently are launching, because it is a model that has excellence to it. It covers all aspects of the manufacturing proc-

ess. Like Srini said, good manufacturing practices are the basis of that, but you must go beyond that in banned substances.

So how did I get involved with Major League Baseball? They called me and they look to NSF as leaders in this area, and they wanted to partner with us to also solve a problem for their players, but we don't want to do this just for professional sport. We want that parent—I had two children that went through high school swimming and diving. I know how competitive that is. They had an advantage. They had a registered dietitian that used to be a sports nutritionist as a mom, but not all high school students and their parents have the kind of information that I have.

So what we really need to do is address this particular issue for the youth athletes, for their parents who are trying to make decisions on a daily basis, and for those who fear not to take supplements because they may lose a competitive edge. You can't ignore that problem. So whether you are Sasha Cohen or you are my high school swimmer, you need an answer, and we really believe the program that we put together provides a solution. It provides an answer.

Mr. ISSA. I appreciate it and I believe it does. That brings me to a followup question though, is that if I am a baseball player or a football player at the professional level, I basically have a cafeteria I can walk up to and take my supplements now. That is because they can afford it, because professional sports provides it. Not only do they have an authorized list, but they are essentially saying whatever your needs are, come to us and we are going to have it in the cage.

You are not going to have that for your two children. Is there a list? I mean if I am a parent, can I see the list of what is in the cages at professional sports teams?

Ms. JORDAN. Absolutely. This program is the NSF athletic banned substances program. The mark is the NSF blue mark. Underneath, it says certified for sport, www.NSF.org. Those products that go through that program and meet all the rigorous requirements will bear that mark on the label.

Mr. ISSA. So that is a special mark?

Ms. JORDAN. Special mark certified for sports. They know what it is all about. We have information on our Web site and collateral material, educational materials, to back that up, and in addition to having the mark on the label, the products will be listed on our Web site. That is free. Consumers can access that. Retailers can access that.

Mr. ISSA. At www dot——

Ms. JORDAN. NSF.org I know you will be going right there after this hearing.

Mr. ISSA. I was hoping to get that out for a reason, and that is like many of you, maybe not like you four, but I go to the nutritional supplement aisle and my eyes blur, and I can't find anything that cures that because there are so many different bottles and every manufacturer uses a label through its entire fleet that looks the same. So it makes it even harder to pick out, and of course every store decides to put this brand—I won't name any brands here today, but this brand here, this brand here, and this brand

here, which means if you want to compare Vitamin Cs, it is another half hour of pulling them off the shelf to compare them.

So, yes, I wanted to know that there is a Web site you can go to in advance, figure out what you want, and come there with a shopping list so that you are not simply looking for a blue NSF randomly; you already know the products that you have selected. And I hope that is a consumer lesson that we can help with today.

Dr. Srinivasan, I am sorry I have pronounced it differently every time. In your written testimony, you explained that USP would periodically test off-the-shelf products that have been previously certified, if you will—this is the loop issue of quality—to ensure they continue to meet USP standards. How often do you perform such tests? In other words, what is your sampling rate? Have you ever had a product that did not meet your standards? That is a softball question. And if so, what did you do about it? How do you complete that quality circle when that happens?

Dr. SRINIVASAN. Yes. The official surveillance testing beginning 1 year after the certification, coinciding with the anniversary of the certification. How often do we test the products? Each product gets at least on three different occasions three different lots manufactured at three times will be taken for testing. Have we found any problem with those surveillance testing? So far none, but what we do, while the products are still carrying the mark, the manufacturers are required to submit to us the shelf life studies supporting the expiration date they claim, and we have found one product that is about to go below the label ingredient level. We advise them to take it out and reformulate the product. That is only one case. That is another responsible organization. So that was reformulated.

So that is my answer to that, Mr. Chairman.

Mr. ISSA. OK. I get a feel for it. I am not sure I got an understanding of the standard of parts per thousand, per million, that would lead you. In other words, if I am a manufacturer and I have 100 different products and they are all certified and I am producing just a hypothetical 100 of each, how many samples would you take? I understand the how often, but I don't understand—normally in quality control, there is a table of your testing that is based on numerics that lead you to believe you are going to get a 97 point-some accuracy statistically.

Dr. SRINIVASAN. The sampling is a random sampling. If there are 10 batches produced, the square root of 10 plus 1, that would be 3 plus 1, would be the number of batches that would be taken initially. After these have been tested, the very next lot, the third level, we will take another four more samples. In other words, we will be completing all 10, but in a phased manner.

Mr. ISSA. Last followup: In your written testimony, you stated that some products while legal to market, USP had refused to verify because of safety concerns, the ginko containing ephedra and other substances. Can explain to us what those safety concerns were and why you were sort on the leading edge of doing the right thing sooner?

Dr. SRINIVASAN. The product that you referred just now, ginko containing glucosamine, was submitted to us by an organization verification. So glucosamine is a cardiovasodialator, at least as listed in the medical directory for the heart. So that raised a question

of safety. So that product was reported to our expert committee for evaluation whether this ingredient was fit to be verified or not. The expert committee was not very happy about that, but they didn't have enough evidence to say this is very unsafe or safe, so at this stage, better to not verify such products, this unknown safety concern.

Mr. ISSA. This particular sample also had ephedra in it after ephedra had been banned, is what our notes said.

Dr. SRINIVASAN. We don't have ephedrine. No products that have been submitted contain ephedrine so far.

Mr. ISSA. I am sorry. We got this from your testimony on this particular one, that you listed ginko containing—and I am so bad at pronouncing some of these names—the drug you mentioned, ephedra, Kava Kava.

Dr. SRINIVASAN. OK. That might have been a comma was missing. Ginko containing glucosamine, comma, ephedra, comma, Kava, such products would not be considered.

Mr. ISSA. OK. We took you literally rather than figuratively of such products. That was why we were following up on that.

I want to thank you all for an exhaustive set of testimony and Q and A. We will leave the record open for 2 weeks should you have any additional answers or thoughts or supplemental material you would like to submit. Additionally, I would ask would you be willing to take additional questions should Members who weren't able to get here have them?

[Panelists gesture in the affirmative.]

Mr. ISSA. OK. Then that will all go on during that period. Thank you all.

This meeting is adjourned.

[Whereupon, at 1:10 p.m., the committee was adjourned.]

[NOTE.—The followup questions of Hon. Chris Cannon were not answered.]

[The prepared statements of Hon. Dan Burton and Hon. Elijah E. Cummings, and additional information submitted for the hearing record follow:]

Statement of Congressman Dan Burton

The Regulation of Dietary Supplements: A Review of Consumer Safeguards
Committee on Government Reform Hearing
March 9, 2006

Mr. Chairman, thank you for convening this hearing today. As you know, I, along with millions of Americans, firmly believe that dietary supplements have been shown through research and historical use to be of immeasurable benefit to human health. In fact, as a regular consumer, I know firsthand the health benefits of using dietary supplements on a daily basis. Consequently, I proudly serve as Co-Chairman of the Congressional Complementary and Alternative Medicine (CAM) Caucus, along with my colleague Representative Dennis Kucinich of Ohio here in the House, and Senators Orrin Hatch of Utah and Tom Harkin of Iowa, who have been true champions on these issues in the Senate.

Together, we have worked hard in a bi-partisan fashion for continued research on the safety and efficacy of all dietary supplements manufactured and sold in the United States. It remains our top priority to ensure that only the highest quality of safe products is made available to American consumers.

Today, we are going to hear a lot of talk about an October 18, 2005 article in the *Washington Post* illustrating the dangers of performance-enhancing drugs in dietary supplements. Let's be clear, anabolic and "designer" steroids are not dietary supplements. Even the Washington Post article acknowledges this fact by noting that the manufacturers of the products tested for the story did not comply with Food and Drug law and required labeling.

Unfortunately, there is no denying that there have been companies that have operated outside the law by illicitly marketing drugs or steroids as dietary supplements; wrongly implicating a legitimate industry. Nevertheless, I do not believe that the American consumer – who by and large feels very strongly about protecting their freedom to access dietary supplements – and the legitimate supplement industry should be punished for the misdeeds of a few bad apples and a couple of professional athletes who want to push the blame their own illegal steroid use onto someone else.

Companies that market illegal products as dietary supplements should be brought to account for their actions. The way to do that, however, is not by enacting new legislation to restrict access to supplements because the few companies and individuals currently breaking the law are not likely to obey any new law that Congress passes. The solution to this problem is to ensure that our regulatory agencies do their job of enforcing the existing law.

What we need is for the Food and Drug Administration (FDA) to finally do its job and fully and fairly implement the Dietary Supplement Health and Education Act (DSHEA),

Congress, the dietary supplement industry trade associations, and the American publics have been asking FDA to do for years. The FDA has the authority to go after companies that are marketing illegal products and yet it continues not to fully utilize that authority.

The FDA has extensive regulatory capacity under existing law. In relationship to the number of products used by Americans, there is a very low rate of serious adverse events associated with supplements. Because of that record of safety, when we passed DSHEA, we deemed products already in the marketplace to be safe. When a product contains an ingredient not in the food supply before 1994, manufacturers are required to submit notice to the FDA of the ingredient. If the FDA has safety concerns they reject the request and the ingredient does not enter the marketplace. Manufacturers are also required to have in their files safety data on every product they sell as well as substantiation on every claim they make for their products. The FDA has the authority to inspect these data at any time.

Given the very public discussion on this issue, I would like to know how many companies marketing performance enhancing products or anabolic steroids on the internet have been the subject of an FDA inspection? What specific action has the FDA taken to enforce the existing law? We passed registration requirements for companies under the bioterrorism regulations that require all FDA regulated products, including dietary supplements to register with the FDA. The existing GMP and labeling regulations are sufficient for the FDA to go after companies that fail to list ingredients on their label, including the 'designer steroids'. How many times has the FDA actually enforced the existing law?

When I had the good fortune to be Chairman of this Committee I initiated an investigation in 1999 into the FDA's implementation of DSHEA, and what we learned from that investigation was disappointing. Now, more than six years after that initial assessment – 12 years since the passage of DSHEA – it seems the FDA still has made little progress towards fully implementing DSHEA. Case in point, the FDA has failed to finalize the Good Manufacturing Practice Guidelines (cGMPs) specific to dietary supplements. This is the key to the regulatory responsibilities of the FDA and yet, they have not accomplished this important milestone.

Six years after the passage of DSHEA, the FDA submitted a proposed regulation to the Office of Management and Budget (OMB), waiting until the last month of the Clinton Administration. The cGMPs like all proposed regulations were pulled back for review with the transition to the Bush Administration and when resubmitted found to be unacceptable. I understand that the latest version has been with OMB since late last year. I hope that today we will hear from the FDA about when cGMPs are going to be finalized.

In closing Mr. Chairman I would just like ask my colleagues to keep in mind the benefits of supplements as they listen to today's this discussion. Seventy percent of Americans are not wrong in their use of dietary supplements and their desire to maintain their freedom to access supplements. Nutritional supplementation is important to good health

at every age group and especially for special populations such as those with cancer, autism, metabolic conditions and auto-immune disorders.

The well-respected Lewin Group has conducted a series of reviews on the existing research literature on certain dietary supplements. Their findings include:

- Omega-3 fatty acids have a positive health affect in reduced relative risk of coronary heart disease (CHD)
- Lutein with zeaxanthin have a positive health effect in reduced risk of age-related macular degeneration (AMD)
    - Within a health insurance context, the five-year estimate of potential net savings resulting from daily intake of omega-3 fatty acids and lutein with zeaxanthin for adults over 65 is approximately $5.6 billion.
- Calcium and Vitamin D taken daily by the over 65 population would provide a net savings in hospital, nursing facility, and physician expenditures of $13.9 billion over five years. More than 730,000 hip fractures could be avoided over this time frame.
- Folic Acid expanded use could save over $1.3 billion dollars over five years and assist in 600 fewer children being born with Neural Tube Defect in the United States.

Before we take any action to restrict Americans assess to dietary supplements we should first focus on holding our Federal regulatory and research agencies accountable, because so far, I am not convinced that the American people have been well served by them when it comes to dietary supplements.

Opening Statement
Representative Elijah E. Cummings, D-Maryland
Full Committee Hearing Entitled:
"The Regulation of Dietary Supplements: A Review of Consumer Safeguards."
Committee on Government Reform
U.S. House of Representatives
109th Congress

March 9, 2006

Mr. Chairman,

Last year, this Committee confronted the increasing abuse of performance enhancing drugs among professional athletes and teens. At that time, we acknowledged that such abuse sends a dangerous message to our young people, undermines the credibility of professional sports, and violates the sanctity of our laws. I was dismayed to learn during the investigation that some dietary supplements containing steroids and other harmful ingredients were at one time available on the market.

With that said, today's hearing is a natural follow-up to our earlier efforts. While some dietary supplements are used as a means to maintain balanced and healthy diets as well as to combat or to prevent chronic diseases, we have an obligation to determine how consumers can best guard against adverse health effects from dangerous or contaminated dietary supplements.

Products claiming to "increase muscle mass," "burn fat," or "boost your immune system" have become ubiquitous in our nation where 50%-60% of the American public regularly consumes dietary supplements. With the passage of the Dietary Supplement Health and Education Act (DSHEA) in 1994, dietary supplements have generally not been subject to regulation and have grown to constitute a $20 billion industry.

Unfortunately, evidence indicates that the public is not fully aware that the Food and Drug Administration (FDA) does not approve dietary supplements. Moreover, under the DSHEA, dietary supplement manufacturers are not required to assess their products for efficacy and safety, and the FDA has limited authority to comprehensively carry out post-market surveillance to evaluate associated health problems once the product is in use.

Make no mistake, ignorance about what the law demands in terms of oversight under a framework of deregulation has left many consumers to unknowingly rely on the mere hope that dietary supplements are not only effective, but also safe.

Even when the FDA determines a dietary supplement poses a considerable health risk, the FDA seems "behind the eight ball" in trying to remove that product from the market. To illustrate this point, one need not look any farther than what occurred with the FDA's removal of the dietary supplement known as Ephedra, a product marketed to support weight loss, improve sports performance, and increase energy.

It took thousands of adverse event reports associated with Ephedra over a decade long period for the FDA to remove it from the market finally concluding that "the substance raises blood pressure and otherwise stresses the circulatory system. These reactions have been conclusively linked to significant adverse health outcomes, including heart ailments and strokes."

It should be noted that the FDA has only removed one dietary supplement (Ephedra) from the market due to a significant health risk. One of two things occur in such a situation, either all dietary supplements pose no significant health risk save one drug named Ephedra, or other dietary supplements that do, remain available on the market that should be removed in the name of safeguarding public health.

While I seldom quote President Reagan, he got it right when he said "trust but verify." Mr. Chairman, we must do more to verify that dietary supplements are safe and effective. The American people trust in us, their government, to ensure that the products they consume are safe from the food on their dinner table to the vitamins they give their children to promote good health.

I yield back the balance of my time and look forward to the testimony of today's witnesses.

The Washington Post

SPORTS

E

TUESDAY, OCTOBER 18, 2005

Chemists Stay a Step Ahead of Drug Testers

Internet Offers New Steroids Designed to Be Undetectable

By AMY SHIPLEY
Washington Post Staff Writer

If members of Congress leading efforts to eradicate performance-enhancing drugs from athletics want to get an idea of just how difficult that will be, they need only turn to the Internet.

While the Bay Area Laboratory Co-Operative investigation continues in San Francisco and Major League Baseball officials argue with the players' union over what penalties should be handed down to drug offenders, the Web already offers a new generation of steroids designed to avoid current tests.

The Washington Post obtained five dietary supplements — each of which touted its ability to build muscle fast — available online and asked a prominent Los Angeles researcher to test them. Don Catlin, who directs the U.S. Olympic drug testing lab at UCLA, said four of the products contained previously undetected anabolic steroids. One contained a steroid that came to the attention of authorities just two years ago but, until now, was thought to be in only limited circulation.

"They are all steroids," Catlin said in a telephone interview after running tests on the substances, which are available in pill or liquid form. "They are all going to be effective." The Post reimbursed Catlin for the cost of testing the substances.

It is impossible to gauge the use of these so-called designer steroids. But their discovery shows how professional athletes, including Major League Baseball and National Football League players and Olympic athletes subject to regular, mandatory drug tests, continue to have at their disposal performance-enhancing products that are not detectable.

Catlin said the steroids are reminiscent of tetrahydrogestrinone, or THG, and norbolethone, the two

See STEROIDS, *E9, Col. 1*

BY BARA EWING — THE WASHINGTON POST

Five dietary supplements obtained by The Washington Post were tested by prominent researcher Don Catlin, who said, "They are all steroids."

steroids connected to BALCO, the Burlingame, Calif.-based nutritional supplements company whose clients included Barry Bonds of the San Francisco Giants and more than a dozen professional baseball and football players and track and field athletes. But unlike THG, which was sold secretly to elite athletes before Catlin discovered it in 2003, the five supplements obtained by The Post are widely available — and affordable. Their costs ranged from $50 to $125 per bottle.

And this might just be the beginning. Two officials with prominent U.S. dietary supplement companies, who spoke on condition of anonymity, said it is easy for companies to outwit drug testers. There's an unlimited pool of steroids, one official said. "You could do this for the next 100 years. . . . The longer they don't pay attention the more rampant it gets."

Difficult Market to Stop

Despite all the attention being given to steroid use in sports, chemists have apparently been able to manufacture a steady stream of new steroids often by just slightly altering the chemical properties of known banned drugs or by turning to long-forgotten recipes from steroid cookbooks from the 1950s and 1960s. "It's pretty obvious what's going on," Catlin said. The companies "are making tons of money. If they don't get caught, they turn on the spigot and turn out more."

"It's not very difficult for some smart chemist to bypass" the law, said Olivier Rabin, the science director at the World Anti-Doping Agency, which sets drug policy for many international sports. The Montreal-based agency announced last month that it would place the steroids in three of the products obtained by the Post on its 2006 list of banned drugs following an internal review that was not connected to Catlin's analysis.

The supplement company officials said the lenient sentences handed down in the BALCO probe seem to have emboldened U.S. companies to delve into the distribution of newly created designer steroids, moving an industry previously the secret domain of "black market" chemists, tight-lipped middlemen and small groups of elite athletes into the mainstream.

BALCO founder Victor Conte, who admitted giving steroids and other drugs to athletes, negotiated a plea deal with federal prosecutors this year that included just four months' imprisonment. Former NFL linebacker Bill Romanowski admits in a new book that he used Conte's designer steroids to avoid the league's drug testing program. "As soon as I found out something could be tested for, I stopped taking it," the book states, CBS News reported Sunday.

In response to the furor over the BALCO revelations, Congress this year held several high-profile hearings in which it heard testimony from athletes and sports league commissioners about steroid use. Lawmakers introduced four separate bills aimed at imposing federal drug testing standards on professional sports, though none is expected to pass this year.

Officials within the dietary supplement industry said increasingly rigorous drug testing in U.S. professional sports and tougher anti-steroid laws — the Anabolic Steroid Act of 2004 made 36 steroids illegal, bringing the total to 59 banned in the United States — have sent the demand for undetectable steroids skyrocketing.

Catlin said that in more than 20 years in Olympic drug testing, he had found only three designer steroids, all between 2002 and 2004, before this summer, when The Post sent him the five dietary supplements. "THG was the thing that broke it all open," Catlin said. "It's a simple step to expect that more people will come into the market because there's money to be made."

Athletes have for decades sought out anabolic steroids because they help build muscle and endurance. But steroids are also known for undesirable side effects and most professional sports have banned their use.

The five products tested by Catlin were Superdrol, supplied by Designer Supplements of New Hyde Park, N.Y.; for Anabolic Xtreme of San Diego; Prostanozolan; Ergomax LMG, both marketed by Applied Lifescience Research Industries (ALRI) of Las Vegas; Methyl 1-P, sold by Legal Gear of Brighton, Mich.; and FiniGenX Magnum Liquid, sold by PharmaGenX of San Marcos, Calif.

Representatives from each of the companies declined or did not respond to multiple written and telephone requests for interviews.

Kevin Smith, the president of Anabolic Xtreme, said in an e-mail that the company no longer distributes Superdrol.

ALRI head Author L. Rea and industry partner Bruce Knefler of Gaspari Nutrition, which has a working relationship with ALRI, wrote in an open letter to The Post on its public Internet message board that "none of the compounds we have developed and currently market are in current violation of any controlled substance act at either the federal or state level. . . . We feel our products are correctly [and legally] marketed to and for educated, intelligent adult men."

Known steroids were first banned in the United States in the Anabolic Steroid Control Act of 1990, which was crafted during the furor over steroids that arose after Canadian sprinter Ben Johnson tested positive for an anabolic steroid at the 1988 Summer Games in Seoul after winning a gold medal in the 100 meters.

Congress last year banned dozens of dietary supplements in an attempt to curb the distribution of steroid products. That law, which went into effect in January, was aimed primarily at products known as steroid precursors, substances that metabolize into illegal steroids only after they are ingested. The products obtained by The Post are full-blown steroids, Catlin said.

"Congress has spoken definitively, absolutely, on any kind of anabolic steroids or precursors," said Rep. John E. Sweeney (R-N.Y.), who is sponsoring legislation that would make it more difficult to buy banned steroids over the Internet by forcing Internet auction sites to more aggressively police themselves. "This is absolutely contrary to what we've already been very clear about. . . . It's really a flouting of the laws in place, and it requires Congress to look harder and close those loopholes."

It is against the law to sell drugs that are improperly labeled or not approved by the Food and Drug Administration.

Improper Labeling

Catlin's analyses of the five products obtained by the Post suggest that none is properly labeled as a dietary supplement, as defined in the Dietary Supplement Health and Education Act of 1994, which governs the industry and places dietary supplements in a special category under the general umbrella of foods rather than drugs. The FDA declared THG illegal after it was identified by Catlin in 2003, noting that it was a synthetic anabolic steroid.

FDA officials declined interview requests, according to FDA spokeswoman Kimberly Rawlings, but in an e-mailed statement she said the agency has been aggressively combating the distribution of steroids and steroid-like substances in dietary supplements. Rawlings cited regulatory steps taken since 2004 to remove androstenedione — which is known as andro and was made famous by former baseball player Mark McGwire in the 1990s — from the market.

"The agency is prepared to take appropriate action against any product that purports to be a dietary supplement if it is determined that product contains steroids, steroid precursors or active ingredients found in prescription drugs," Rawlings said.

One of the steroids Catlin identified had been available on the underground steroid market before it made its way into supplements: Ergomax LMG, Catlin said. She found the steroid madol — also known as DMT — that attracted headlines after it was seized by Canadian customs in December 2003 from a former Canadian sprinter, who was prescribed in Canada on drug charges earlier this year. After the athlete was caught with the drug, WADA declared it banned.

Bottles of Superdrol and Ergomax LMG obtained by The Post in August did not contain their chemical formulations on their labels, referring to their contents only by trademarked names — Methasteron in the case of Superdrol and Eherobolin in the case of Ergomax. Catlin said neither name had any scientific meaning that would aid in identifying it. A bottle of Prostanozol reported its chemical formulation, but used outdated chemical language in what Catlin said appeared to be an attempt to avoid being flagged by some nasty government "computers." And — two ingredients — one a synthetic anabolic steroid, another a progestin, a close relative to a steroid — did not match the chemical names reported on a bottle of Methyl 1-P, Catlin said. An advertisement for FiniGenX Magnum on the company Web site gives insight into PharmaGenX's operating philosophy.

"THE MOST POTENT DIETARY SUPPLEMENT EVER DEVELOPED FOR SIZE AND STRENGTH IS STILL LEGAL!" the advertisement says. "Finigenx Magnum . . . was not on the updated Anabolic Steroid Control Act of 2004. We had independent chemists search the 'Act' from top to bottom for Finigenx Magnum or any ingredients that are in our solution and they came up with ZERO, ZIP, NADA."

Hide and Seek

Scientists had long suspected athletes were using new, undetectable "designer" steroids to beat drug tests, but they could never prove it until the Bay Area Laboratory Co-Operative (BALCO) scandal exploded in 2003. BALCO exposed a sophisticated underground ring that supplied steroids to prominent athletes in many sports. Since the identification of BALCO steroids norbolethone and THG, Don Catlin and his team at the UCLA Olympic Analytical Laboratory have discovered more designer steroids. The latest are sold as dietary supplements and are widely available on the Internet. Company representatives say they are offering legal alternatives to steroids. These products contain designer steroids, according to Catlin, who analyzed them for The Post:

Recently discovered

ALRI's Ergomax LMG

Contains madol or DMT and is similar to several orally ingestible steroids. First surfaced when customs seized it from a former Canadian sprinter in 2003.

Anabolic Xtreme's Superdrol

Resembles drostanolone. It has a Chemical Abstract Services registry number, suggesting it has been studied for medical uses in the past.

ALRI's Prostanozol

Resembles stanozolol. No known previous uses.

PharmGenX FiniGenX Magnum Liquid

Resembles trenbolone. Chemical formulation is commercially available through a Shanghai company.

Legal Gear's Methyl 1-P

Contains two steroids. One resembles androstenedione and the other is a progestin.

Found previously

Norbolethone

Found in the urine of a cyclist in the summer of 2002 and later connected to the BALCO scandal. It was studied in the 1960s by a pharmaceutical company but never marketed. Resembles gestrinone.

THG
(nicknamed "the clear")

Discovered in 2003 and linked to several high-profile athletes in the BALCO scandal. Resembles trenbolone and gestrinone.

Life Cycle of a Designer Steroid: A Hypothetical Example

Drug tests catch known steroids, and nearly all known steroids are illegal without a prescription. Chemists can comb through old research manuals and produce steroids that were never marketed or tweak known steroids to come up with something new. In either case, the result is a "designer" steroid.

An Easy Fix

For a chemist who knows what he is doing, turning a known steroid into a designer steroid is easier and less expensive than starting from scratch. For example, the illegal steroid gestrinone can become THG just by adding hydrogen.

CATALYST — **Put a flask on ice. Add a catalyst that will bond hydrogen to gestrinone** (in this case, palladium on charcoal black powder).

METHANOL — **Add methanol**, a neutral liquid, to create a suspension.

HYDROGEN — **While stirring, bubble hydrogen gas into the mixture for five minutes.**

[illegible] — **In a different container, dissolve gestrinone in methanol. Then add it to the flask** and stir for 30 more minutes.

[illegible] — **Filter the mixture to recover the liquid and blow it dry with a stream of nitrogen gas.** What is left is THG.

1 Scientist alters a known steroid to create a new one. It cannot be detected in standard drug screens and it is not illegal.

2 It is put up for sale on the Internet. Designer steroids seem to have gone from the domain of black-market chemists to the dietary supplement industry. Some supplement makers realized they could make a fortune selling designer steroids and likely could [illegible]

3 An athlete uses the product to build muscle mass and speed recovery, [illegible] health consequences [illegible] knowledge.

4 [illegible] product and [illegible] which prohibits athletes [illegible] "related substances," [illegible] includes designer steroids.

5 Outrage that such products are being sold already is [illegible] notice of U.S. Lawmakers. The FDA can ban such products, but in the case of designer steroids, it rarely has.

6 If the drug is still on the market, it is pulled off by the manufacturer. Most likely, it is already [illegible], and its creator is working on a new designer steroid.

BANNED USE

A legal gray area: Why designer steroids are allowed to be sold

Officials with the Food and Drug Administration and Drug Enforcement Agency condemn products that contain designer steroids, yet they are often on the market for months, and their makers are rarely penalized. Why does this happen?

Problem 1: Supplements are lightly regulated. Manufacturers bypass the rigorous drug approval process by selling steroids as dietary supplements, which are more loosely regulated. Companies are supposed to get FDA approval of new dietary supplement ingredients, but they often don't.

Problem 2: The law is too specific. The DEA cannot prosecute the supplement makers because prosecutors, unknown steroids are not listed in either the 1990 Anabolic Steroid Control Act or its 2004 revision. Lawmakers have determined that a catch-all clause that covers yet-to-be-discovered steroids wouldn't hold up in U.S. court.

Problem 3: The FDA is a step behind. The FDA has the power to take products off store shelves, but it has not reacted in a timely fashion to steroid products. For example, last year it banned androstenedione, the first steroid product sold as a dietary supplement, after most companies had already stopped making it.

SOURCES: FDA; Don Catlin and Caroline K. Hatton of the UCLA Olympic Analytical Laboratory in Los Angeles

DESIGN BY AMY CHRISTY BROWN — CRISTINA RIVERS — THE WASHINGTON POST

Additional Questions
Congressman Cannon
Committee on Government Reform
"The Regulation of Dietary Supplements: A Review of Consumer Safeguards" Hearing
March 9, 2006

Questions for Dr. Robert E. Brackett:

When does the Agency anticipate the rule will be published?

Would the Agency consider publishing a final rulemaking with comment in order to allow additional comments to be submitted?

Does the Agency plan to write any guidelines that further interprets the final rule?

Does the Agency anticipate the cost of compliance related to the GMP ruling will increase the price of dietary supplements for consumers?

Does FDA anticipate this new rule could cause small companies to go out of business? If so, what is the Agency's estimate of how many? (For example, during public meetings regarding the GMP ANPR, FDA estimated up to 250 small companies could go out of business due to the economic cost of complying with the proposed regulation.) Have the economic concerns been meted with changes in the proposed ruling?

Does the final ruling compare more with Food cGMP, as provided in DSHEA, or is an about face and more in-line with pharmaceutical cGMP?

Is the final ruling similar to the Advance Notice of Proposed Rulemaking in that a great deal of emphasis was placed on finished product testing?

What is the implementation time frame for the final GMP rule? Is it consistent with the proposed rule?

What resources will the Agency allocate for industry/public education?

What resources will the Agency allocate for enforcement?

Does the ruling apply to raw material providers and foreign manufacturing interests?

How does the Agency intend to reach out to industry to gain a better understanding of dietary ingredient and dietary supplement manufacturers' operations?

Will the reader suppose, if I have dwelt upon a point, or rather a multitude of points, which have been, or might be, disputed, that I do so because I am, or have been, a disputant? I do not. I do it to save others from the trouble of disputing.

A man who is a public character

is a character with whom the public at large think they have a right to be acquainted.

Can anyone read a sermon with the same disinterestedness?

Follow-up Questions

For the House Government Reform Committee Hearing

"The Regulation of Dietary Supplements: A Review of Consumer Safeguards"

March 9, 2005

Question: Can you tell us the number of adverse event reports FDA received for dietary supplements over the past year?

Answer: CFSAN Adverse Event Reporting System (CAERS) is a post-market surveillance system. CAERS collects voluntary adverse event reports (and product complaints) that are associated with CFSAN-regulated products. Adverse event reports submitted to CAERS vary in the quality and reliability of information provided. Information is recorded "as reported," and the accuracy of symptom(s), product(s), product ingredients, and amount(s) taken is dependent upon the quality of the report. Report quality may vary based on the information available to the reporter. Furthermore, in many cases, the person experiencing the adverse event may have used other products, and many products contain multiple ingredients. These variables complicate the evaluation and attribution of adverse events.

	Adverse Event Reports	Product Quality Complaints	Total
Total Dietary Supplement Reports Received in CY2005	492	132	624

Question: What is FDA doing to remove the products from store shelves that were manufactured by Hi-Tech, like this bottle, Lipodrene?

Answer: On February 23, 2006, the U.S. Marshalls seized approximately $3 million worth of ephedrine alkaloid-containing dietary supplements and bulk raw materials from Hi-Tech Pharmaceuticals in Georgia. The seizure included more than 200 cases of finished product, more than 200 boxes of bulk tablets and nine 25 kilo drums of ephedrine alkaloid raw material The seizure included the finished products Lipodrene, Stimerex, and Betadrene, which are labeled as containing 25 mg of ephedrine alkaloids per tablet. The product labels state that the maximum recommended dosage of ephedrine for a healthy adult is 100 mg in a 24 hours period.

This seizure applies only to materials that were in the possession of the firm at the time the seizure was executed. The link to FDA's press release on the Hi-Tech seizure is http://www.fda.gov/bbs/topics/NEWS/2006/NEW01325.html

CR INVESTIGATES

DANGEROUS SUPPLEMENTS STILL AT LARGE

If you can buy it at a clean, well-lighted store, if it's "all natural," it's not going to do you serious harm, right? That's what many Americans assume about dietary supplements. But while most supplements are probably fairly benign, CONSUMER REPORTS has identified a dozen that according to government warnings, adverse-event reports, and top experts are too dangerous to be on the market. Yet they are. We easily purchased all 12 in Feburary in a few days of shopping online and in retail stores.

These unsafe supplements include Aristolochia, an herb conclusively linked to kidney failure and cancer in China, Europe, Japan, and the U.S.; yohimbe, a sexual stimulant linked to heart and respiratory problems; bitter orange, whose ingredients have effects similar to those of the banned weight-loss stimulant ephedra; and chaparral, comfrey, germander, and kava, all known or likely causes of liver failure. (For a complete list of the "dirty dozen," see the table on page 15.)

U.S. consumers shelled out some $76 million in 2002 for just three of these supplements: androstenedione, kava, and yohimbe, the only ones for which sales figures were available, according to the Nutrition Business Journal, which tracks the supplement industry.

The potentially dangerous effects of most of these products have been known for more than a decade, and at least five of them are banned in Asia, Europe, or Canada. Yet until very recently, the U.S. Food and Drug Administration had not managed to remove a single dietary supplement from the market for safety reasons.

After seven years of trying, the agency announced a ban on the weight-loss aid ephedra in December 2003. And in March 2004 it warned 23 companies to stop marketing the body-building supplement androstenedione (andro).

Despite these actions against high-profile supplements, whose dangers were so well known that even industry trade groups had stopped defending them, the agency continues to be hamstrung by the 1994 Dietary Supplement Health and Education Act (DSHEA, pronounced de-*shay*). While drug manufacturers are required to prove that their products are safe before being marketed, DSHEA makes the FDA prove that supplements on the market are *unsafe* and denies the agency all but the sketchiest information about the safety record of most of them.

"The standards for demonstrating a supplement is hazardous are so high that it can take the FDA years to build a case," said Bruce Silverglade, legal director of the Center for Science in the Public Interest, a Washington, D.C., consumer-advocacy group.

At the same time, the FDA's supplement division is understaffed and under-

CR Quick Take

A CR investigation found that many dangerous supplements can easily be purchased in stores and online. Many of these supplements have been banned in other countries. Why can't the U.S. Food and Drug Administration ban these products now?

We found that regulatory barriers created by Congress, supplement industry pressure, and a lack of resources at the FDA have resulted in major risks for consumers.

- These widely available dietary supplements (see table on page 15) may cause cancer, severe kidney or liver damage, heart problems, or even death. They should be avoided by consumers.
- These supplements are sold under a profusion of names, making it difficult for consumers to know what they're purchasing.
- Most also appear in combination products marketed for a broad array of uses, such as aphrodisiacs, athletic-performance boosters, and treatments for anxiety, arthritis, menstrual problems, ulcers, and weight loss.

funded, with about 60 people and a budget of only $10 million to police a $19.4 billion-a-year industry. To regulate drugs, annual sales of which are 12 times the amount of supplement sales, the FDA has almost 43 times as much money and almost 48 times as many people.

"The law has never been fully funded," said William Hubbard, FDA associate commissioner for policy and planning. "There's never been the resources to do all the things the law would command us to do."

The agency has learned that it must tread carefully when regulating supplements. The first time it tried to regulate the dangerous stimulant ephedra, in 1997, overwhelming opposition from Congress and industry forced it to back down.

As a result, the FDA is sometimes left practicing what Silverglade calls "regulation by press release"—issuing warnings about dangerous supplements and hoping that consumers and health practitioners read them.

There are signs of hope. The FDA has said that if the ban on ephedra holds up against likely legal challenges, it plans to go after other harmful supplements. Legislation has been introduced to strengthen the FDA's authority under DSHEA and give the agency more money to enforce the act.

But the supplement marketplace still holds hidden hazards for consumers, especially among products that aren't in the headlines. "Consumers are provided with more information about the composition and nutritional value of a loaf of bread than about the ingredients and potential hazards of botanical medicines," said Arthur Grollman, M.D., professor of pharmacological sciences at the State University of New York, Stony Brook, and a critic of DSHEA.

A QUESTION OF SAFETY

Supplement-industry advocates say the ephedra ban demonstrates that DSHEA gives the FDA enough power to protect consumers from unsafe products. "I don't think there's anything wrong except that FDA has only recently begun vigorous and active enforcement of the law," said Annette Dickinson, Ph.D., president of the Council for Responsible Nutrition, a major trade association for the supplement industry.

But critics of DSHEA think the ban illustrates the extremes to which the FDA must go to outlaw a hazardous product.

When the agency initially tried to rein in ephedra use in 1997, after receiving hundreds of reports of adverse events, it sought not an outright ban but dosage restrictions and sterner warning labels. The industry mounted a furious counterattack, including the creation of a public-relations group called the Ephedra Education Council and a scientific review from a private consulting firm, commissioned by Dickinson's trade group, that concluded ephedra was safe. After the U.S. General Accounting Office said the FDA "did not establish a causal link" between taking ephedra and deaths or injuries, the agency was forced to drop its proposal.

The industry continued to vigorously market and defend ephedra. Metabolife International, a leading ephedra manufacturer, did not let the FDA know that it had received 14,684 complaints of adverse events associated with its ephedra product, Metabolife 356, in the previous five years, including 18 heart attacks, 26 strokes, 43 seizures, and 5 deaths. It took the pressure of congressional and Justice Department investigations to get the company to turn over the complaints in 2002. Then Steve Bechler, a pitcher for the Baltimore Orioles, died unexpectedly in 2003 while taking another ephedra supplement, Xenadrine RFA-1. With sales suffering from the bad publicity, manufacturers began to replace ephedra with other stimulants such as bitter orange, which mimics ephedra in chemical composition and function.

"All of a sudden Congress dropped objections to an ephedra ban and started demanding the FDA act," said Silverglade.

To amass the necessary scientific evidence that it hoped would satisfy the demanding standard set by DSHEA, the FDA took aggressive action: It commissioned an outside review from the RAND Corporation, analyzed adverse-event reports, and pored over every available shred of scientific evidence.

"We've gone the whole nine yards to collect and evaluate all the possible evidence," Mark McClellan, commissioner of the FDA, said in announcing the ban. "We will be doing our best to defend this in court, and if that's not sufficient, it may be time to re-examine the act."

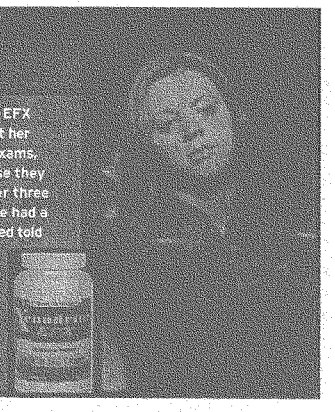
DRUGS VS. SUPPLEMENTS

In an October 2002 nationwide Harris Poll of 1,010 adults, 59 percent of respondents said they believed that supplements must be approved by a government agency before they can be sold to the

SUFFERED SEIZURE

Gretchen Fitzgerald, age 21, Fort Collins, Colo.

PROBLEM: She took Xenadrine EFX "thermogenic" diet pills to boost her energy while studying for final exams, believing they were safe because they were labeled ephedra-free. After three weeks of taking the product she had a seizure. The neurologist consulted told her the bitter orange in the Xenadrine was the probable cause. Xenadrine's manufacturer did not return our phone calls. Since going off the Xenadrine, Fitzgerald has had no further problems.



public. Sixty-eight percent said the government requires warning labels on supplements' potential side effects or dangers. Fifty-five percent said supplement manufacturers can't make safety claims without solid scientific support.

They were wrong. None of those protections exist for supplements—only for prescription and over-the-counter medicines. Here are the major differences in the safety regulations:

Testing for hazards. Before approval, drugs must be proved effective, with an acceptable safety profile, by means of lab research and rigorous human clinical trials involving a minimum of several thousand people, many millions of dollars, and several years.

In contrast, supplement manufacturers can introduce new products without any testing for safety and efficacy. The maker's only obligation is to send the FDA a copy of the language on the label (see Names & Claims, page 16).

"Products regulated by DSHEA were presumed to be safe because of their long history of use, often in other countries," said Jane E. Henney, M.D., commissioner of the FDA from 1998 to 2001. "As their use dramatically increased in this country after the passage of DSHEA, the presumption of safety may have been misplaced, particularly for products other than traditional vitamins and minerals. Some, like ephedra, act like drugs and thus have similar risks."

The only exceptions to this "presumption of safety" are supplement ingredients that weren't being sold in the U.S. when DSHEA took effect. Makers of such "new dietary ingredients" must show the FDA evidence of the products' safety before marketing them. The FDA invoked that rarely used provision in its action against androstenedione. After years of allowing andro to be marketed without restriction, the agency declared that it was "not aware" that the supplement was used before DSHEA, so it couldn't be sold without evidence of safety.

Disclosing the risks. Drug labels and package inserts must mention all possible adverse effects and interactions. But supplement makers don't have to put safety warnings on the labels, even for products with known serious hazards.

We bought a product called Relaxit whose label had no warning about the kava it contained, even though the American Herbal Products Association, an industry trade group, recommends a detailed, though voluntary warning label about potential liver toxicity on all kava products.

Ensuring product quality. Drugs must conform to "good manufacturing practices" that guarantee that their contents are pure and in the quantities stated on the label. While DSHEA gave the FDA authority to impose similar standards on supplements, it took until 2003 for the agency to propose regulations—as yet not final—to implement that part of the law.

Contaminants, too, regularly turn up in supplements. In 1998 Richard Ko, Ph.D., of the California Department of Health Services reported that 32 percent of the Asian patent medicines he tested contained pharmaceuticals or heavy metals that weren't on the label. The FDA has seized supplements adulterated with prescription drugs, including, in 2002, an herbal "prostate health" supplement called PC SPES that turned out to contain a powerful prescription blood thinner, warfarin.

Reporting the problems. By law, drug companies are required to tell the FDA about any reports of product-related adverse events that they receive from any source. Almost every year, drugs are removed from the market based on safety risks that first surfaced in those reports.

In contrast, supplement makers don't have to report adverse events. Indeed, in the five years after DSHEA took effect, 1994 to 1999, fewer than 10 of the more than 2,500 reports that the FDA received came from manufacturers, according to a 2001 estimate from the inspector general of the U.S. Department of Health and Human Services. (Other sources of reports included consumers, health practitioners, and poison-control centers.) Overall, the FDA estimates that it learns of less than1 percent of adverse events involving dietary supplements.

THE 'NATURAL' MYSTIQUE

Many makers market their supplements as "natural," exploiting assumptions that such products can't harm you. That's a dangerous assumption, said Lois Swirsky Gold, Ph.D., director of the Carcinogenic Potency Project at the University of California, Berkeley, and an expert on chemical carcinogens. "Natural is hemlock, natural is arsenic, natural is poisonous mushrooms," she said.

A cautionary example is aristolochic acid, which occurs naturally in species of Aristolochia vines that grow wild in many

KIDNEYS FAILED

Beverly Hames, age 59, Beaverton, Ore.

PROBLEM: Hames went to an acupuncturist in 1992 seeking a "safe, natural" treatment for an aching back. She got a selection of Chinese herbal products, at least five of which were later found to contain aristolochic acid. By mid-1994, she had symptoms of kidney failure, and in 1996 she underwent a kidney transplant. She must take anti-rejection drugs (right) for life. The herbs' distributor said his Chinese suppliers had substituted Aristolochia for another herb without his knowledge.

PHOTO BY ERIK STEINBAKKEN

Twelve supplements you should avoid

The 12 supplement ingredients in this table have been linked to serious adverse events or, in the case of glandular supplements, to strong theoretical risks. They're all readily available on the Web, where our shoppers bought them both individually and in multi-ingredient "combination products." We think it's wise to avoid all of them. But the strength of that warning varies with the strength of the evidence and the size of the risk. So we've divided the dirty dozen into three categories: definitely hazardous, very likely hazardous, and likely hazardous.

NAME (ALSO KNOWN AS)	IN PRODUCTS SUCH AS [1]	DANGERS	REGULATORY ACTIONS
DEFINITELY HAZARDOUS *Documented organ failure and known carcinogenic properties*			
Aristolochic acid *(Aristolochia*, birthwort, snakeroot, snakeweed, sangree root, sangrel, serpentary, serpentaria; *asarum canadense*, wild ginger)	Vāxa PMS-Ease, Shanghai Chinese Herbal Company Cardioflex (Guan Xin Su He Wan), Min Shan Brand Long Dan Xie Gan Wan	Potent human carcinogen; kidney failure, sometimes requiring transplant; deaths reported.	FDA warning to consumers and industry and import alert, in April 2001. Banned in 7 European countries and Egypt, Japan, and Venezuela.
VERY LIKELY HAZARDOUS *Banned in other countries, FDA warning, or adverse effects in studies*			
Comfrey *(Symphytum officinale*, ass ear, black root, blackwort, bruisewort, consolidae radix, consound, gum plant, healing herb, knitback, knitbone, salsify, slippery root, symphytum radix, wallwort)	American Health & Herbs Ministry Asthma Formula 1040 Tincture	Abnormal liver function or damage, often irreversible; deaths reported.	FDA advised industry to remove from market in July 2001.
Androstenedione *(4-androstene-3, 17-dione*, andro, androstene)	AST Sports Science Andro100, SDI-Labs D-Bol Methadrostenol, Young Again Nutrients Androstene Dione	Increased cancer risk, decrease in HDL cholesterol.	FDA warned 23 companies to stop manufacturing, marketing, and distributing in March 2004. Banned by athletic associations.
Chaparral *(Larrea divaricata*, creosote bush, greasewood, hediondilla, jarilla, larreastat)	Arizona Naturals Chaparral Tablets, American Health & Herbs Ministry Bowel & Liver Cleanser Tincture, Larrianera Cla-Larreastat	Abnormal liver function or damage, often irreversible; deaths reported.	FDA warning to consumers in December 1992.
Germander *(Teucrium chamaedrys*, wall germander, wild germander)	Nature's Wonderland Germander Herb Powder	Abnormal liver function or damage, often irreversible; deaths reported.	Banned in France and Germany.
Kava *(Piper methysticum*, ava, awa, gea, gi, intoxicating pepper, kao, kavain, kawa-kawa, kew, long pepper, malohu, maluk, meruk, milik, rauschpfeffer, sakau, tonga, wurzelstock, waona, yangona)	Nutribiotic Metakest, Ancient Herbs Relaxat, Blueberry Matrix Herbal Stress Relief and Relaxation Enhancement Tablet	Abnormal liver function or damage, occasionally irreversible; deaths reported.	FDA warning to consumers in March 2002. Banned in Canada, Germany, Singapore, South Africa, and Switzerland.
LIKELY HAZARDOUS *Adverse-event reports or theoretical risks*			
Bitter orange *(Citrus aurantium*, green orange, kijitsu, neroli oil, Seville orange, shangzhou zhiqiao, sour orange, zhi oiao, zhi xhi)	Xenadrine EFX, Metabolife Ultra, NOW Diet Support	High blood pressure; increased risk of heart arrythmias, heart attack, stroke.	None
Organ/glandular extracts (brain/adrenal/pituitary/placenta/other gland "substance" or "concentrate")	Healthgenesis.com Brain Concentrate Capsules, Plymouth Hall Labs Multigland 5, Aspen Group Gao Fun Pills	Theoretical risk of mad cow disease, particularly from brain extracts.	FDA banned high-risk bovine materials from older cows in foods and supplements in January 2004. (High-risk parts from cows under 30 months old permitted.) Banned in France and Switzerland.
Lobelia *(Lobelia inflata*, asthma weed, bladderpod, emetic herb, gagroot, lobelie, indian tobacco, pukeweed, vomit wort, wild tobacco)	Nature's Way Lobelia Herb respiratory tonic, Nature's Way Breathe-Aid, American Health & Herbs Ministry Asthma Formula 1040 Tincture	Breathing difficulty, rapid heartbeat, low blood pressure, diarrhea, dizziness, tremors; possible deaths reported.	Banned in Bangladesh and Italy.
Pennyroyal oil *(Hedeoma pulegioides*, lurk-in-the-grass, mosquito plant, piliwerial, pudding grass, pulegium, run by the ground, squaw balm, squawmint, stinking balm, tickweed)	Nature's Answer Pennyroyal Herb Extract, Nature's Wonderland Pennyroyal Herb capsules, American Health & Herbs Ministry Pennyroyal Tincture	Liver and kidney failure, nerve damage, convulsions, abdominal tenderness, burning of the throat; deaths reported.	None
Scullcap *(Scutellaria lateriflora*, blue pimpernel, helmet flower, hoodwort, mad weed, mad-dog herb, mad-dog weed, quaker bonnet, scutellaria, skullcap)	Solaray Skullcap Capsules, American Health & Herbs Ministry Appetite Stimulant Formula Tincture	Abnormal liver function or damage.	None
Yohimbe *(Pausinystalia yohimbe*, johimbi, yohimbehe, yohimbine)	Twinlab Yohimbe Fuel, Nature's Purest Herbal Niagara, K Max Power for Men Pure Yohimbe Bark Extract	Change in blood pressure, heart arrythmias, respiratory depression, heart attack, death, reported.	None

[1] *According to product labels.*

Sources: Natural Medicines Comprehensive Database 2004 and Consumers Union's medical and research consultants.

parts of the world. In addition to being a powerful kidney toxin, it is on the World Health Organization's list of human carcinogens. "It's one of the most potent chemicals of 1,400 in my Carcinogenic Potency Database," Gold said. "People have taken high doses similar to the doses that animals are given in tests, and they both get tumors very quickly."

The dangers of aristolochic acid have been known since at least 1993, when medical-journal articles began appearing about 105 patrons of a Belgian weight-loss clinic who had suffered kidney failure after consuming Chinese herbs adulterated with Aristolochia. At least 18 of the women also subsequently developed cancer near the kidney.

These findings prompted the FDA to issue a nationwide warning against Aristolochia in 2001 and to impose a ban on further imports of the herb. But in early 2004, more than two years after the import ban went into effect, CONSUMER REPORTS was able to purchase products online that were labeled as containing Aristolochia. In 2003, Gold identified more than 100 products for sale online with botanical ingredients listed by the FDA as known or suspected to contain aristolochic acid.

Donna Andrade-Wheaton, a former aerobics instructor in Rhode Island, learned those facts too late to save her kidneys. After taking Chinese herbs containing Aristolochia for more than two years, she suffered severe kidney damage; her kidney tissues were found to contain aristolochic acid. In late 2002, at age 39, she underwent a kidney transplant.

Andrade-Wheaton is suing both the acupuncturist who gave her the herbs and several companies that manufactured them. The acupuncturist declined to discuss the case on the record, and the manufacturer did not return our phone calls.

There's another widespread and false assumption about natural supplements: that they're always pure, unprocessed products of the earth. Because DSHEA permits the marketing of concentrates and extracts, supplement makers can and do manipulate ingredients to increase the concentrations of pharmacologically active compounds.

That's especially true of the many weight-loss supplements designed for "thermogenic" stimulant effects—boosting calorie expenditure by revving the metabolic rate.

On one Internet shopping tour, for instance, we bought a product called Thermorexin—"the Hottest new Thermogenic on the market!" Its label says it contains, among its 22 ingredients, 30 milligrams of theophylline derived from a black tea extract and the stimulant bitter orange. Sold as Theo-Dur and other brands, theophylline is a prescription drug and an effective asthma treatment, but most doctors seldom prescribe it because it can cause seizures and irregular heartbeats at relatively low doses.

Larry Berube, president of Anafit, Thermorexin's manufacturer, based in Orlando, Fla., described how the product's combination of ingredients was developed: "Once we find out that the FDA says it's OK, we put them together in the lab, run our tests, and do our trials, and if it comes up good, we capsulate it, put it online and in the stores and sell it," he said.

Those tests involved asking fitness professionals to use the supplement, and measuring their heart rate and blood pressure, Berube said. The company doesn't use a control group, he said. Then "we go to the fitness discussion boards and let trainers and people know we have a new product and do they want to try it," he said. "And then they try it, and they report back." Berube said he has not heard of any bad reactions to Thermorexin.

WHAT YOU CAN DO

Sen. Richard Durbin, Democrat of

names&claims

THE ART AND LAW OF SUPPLEMENT LABELS

- "New 21st century 'designer' D-Bol [label at top right] is so potent it turns genetically average guys into supernatural studs no one messes with!"
- Xenadrine EFX (label at right) "provides the most effective approach to losing weight ever developed!"
- "Thousands of testimonials" credit chaparral (label at far right) "for tumor remissions and complete cures. Other medical evidence indicates it is an anti-inflammatory and antimicrobial agent and a possible treatment for asthma."

Does the government really allow supplement companies to make extravagant promises like those, which we found on Web sites promoting products we purchased? The answer is murky at best.

Under the 1994 Dietary Supplement Health and Education Act, manufacturers can't claim that a product prevents or treats a disease or disorder. But they can say it affects the "structure and function" of the body—"supports healthy prostate function," for example—or shows a "link" to a disease or disorder, and allow consumers to draw their own, often erroneous, conclusions. The FDA can require that a manufacturer change a label that it decides is making an unauthorized health claim.

DSHEA does say, confusingly, that supplement makers must be able to "substantiate" their claims. But it does not specify what that means, nor does it require that the evidence be shown to anybody, not even the FDA.

The Federal Trade Commission has the authority to punish companies whose ads are intentionally misleading. Unlike the FDA, it can force companies to give it documents substantiating suspect claims and order the products off the market if it decides that the substantiation isn't sufficient. But it can't move against a category of products, such as those containing ephedra, nor can it act against dangerous products that aren't advertised to the public.

Since DSHEA's passage, the FTC has brought more than 100 cases against supplement marketers for deceptive advertising. But "there are literally hundreds, perhaps thousands, of companies out there that probably deserve scrutiny," said Richard Cleland, assistant director of the FTC's division of advertising practices. "We don't have the resources to look at every one."

Illinois, and Rep. Susan Davis, Democrat of California, have each introduced legislation that for the first time would require supplement manufacturers to disclose reports they receive of "serious" adverse events. Durbin's bill also sets up a separate category for stimulants, which would have to receive FDA safety approval before being marketed, and reclassifies androstenedione and similar "steroid precursors" as controlled drugs. The Davis bill also strengthens the FDA's powers to investigate emerging supplement safety problems. Davis's bill exempts vitamins and minerals from its provisions. (Consumers Union, publisher of CONSUMER REPORTS, supports both bills.)

Though the bills are still in committee, the supplement industry has mobilized in opposition. On its Web site and in flyers handed out at supplement stores, the National Nutritional Foods Association, a supplement retailers' trade group, says the legislation "would significantly undermine many of the freedoms that American consumers of dietary supplements like you hold dear."

The industry is supporting a more limited bill introduced by Sen. Orrin Hatch, Republican of Utah, and Sen. Tom Harkin, Democrat of Iowa, that would give the FDA an extra $20 million this year, and more in subsequent years, to enforce DSHEA and would reclassify androstenedione and other steroid precursors as controlled drugs. Unlike the Durbin bill, however, this measure would exempt the steroid dehydroepiandrosterone, or DHEA, allowing it to continue to be marketed as an anti-aging product. Some $47 million worth was sold in 2002, according to the Nutrition Business Journal.

Until the law is substantially changed and the FDA is adequately funded, you cannot rely on the federal government to ensure that dietary supplements are safe and effective. Here are some steps you can take to minimize your risk from any supplements you decide to take:

Stay away from the dirty dozen. All carry risks that in our view are unacceptable (see table on page 15). In combination products, you need to read the detailed ingredient list in the tiny print on the back. Who could otherwise guess, for instance, that Gaia Herbs' PMS Day 14-28 capsules contain kava? (To the company's credit, the label includes a warning about liver toxicity.)

Do not take daily doses of vitamins and minerals that exceed the safe upper limits. While vitamins and minerals are by far the safest and best-studied of supplements, it's possible to overdose on some of them. For more information, see "Fortified Foods: Too Much of a Good Thing?," CONSUMER REPORTS, October 2003. Recommended allowances and safe upper limits can be found online at *www.ific.org/publications/other/driupdateom.cfm*.

Limit your intake of other supplements. Over the years, our medical and nutritional consultants have identified and tested a few products, other than standard multivitamins, with possible benefits and sufficiently low risks to recommend for general use: saw palmetto for benign enlarged prostate in men, glucosamine and chondroitin for arthritis, and fish-oil capsules (omega-3 fatty acids) for heart disease. (We plan to test additional supplements with potential benefits, such as probiotics.)

Tell your doctor about your supplements. "The Achilles' heel of unregulated supplements is the risk created by herb-prescription drug interactions," said Grollman, the pharmacologist at the State University of New York. "St. John's wort, used to treat depression, for instance, may reduce the effectiveness of prescription drugs used by millions of Americans for hypertension, AIDS, heart failure, asthma, and other chronic diseases."

Stay away from supplements for weight control. These products frequently contain several stimulants that have never been adequately tested separately, let alone in combinations. "I'd just as soon experiment with rats first rather than using the U.S. population as guinea pigs," said Bill Gurley, Ph.D., professor of pharmaceutical sciences at the University of Arkansas.

Do your own research. Health-food-store clerks and marketers, alternative-medicine practitioners, herbal company Web sites, and even physicians are not necessarily knowledgeable about the scientific evidence regarding dietary supplements. These two Web sites contain reliable information: the National Institutes of Health site at *ods.od.nih.gov/databases/ibids.html* and Memorial Sloan-Kettering Cancer Center's site at *www.mskcc.org/mskcc/html/11570.cfm*.

Watch for adverse events. Let your doctor know if you experience anything worrisome after starting a supplement. If your doctor concludes that the side effect may be related to the supplement, be sure to report it to the FDA, by calling 800-332-1088 or by visiting *www.fda.gov/medwatch*.

KIDNEYS FAILED

Donna Andrade-Wheaton, age 40, Cranston, R.I.

PROBLEM: Andrade-Wheaton's acupuncturist prescribed more than a half dozen Chinese herbal supplements to treat health conditions, including endometriosis. At least one of the products listed Aristolochia as an ingredient, even after the FDA issued a nationwide Aristolochia safety warning in 2001. She underwent a kidney transplant in September 2002 and must take anti-rejection drugs (right) for life.

House Government Reform Committee

hearing on

The Regulation of Dietary Supplements:
A Review of Consumer Safeguards

March 9, 2006

Statement for the Record
Submitted by the

American Society of
Health-System Pharmacists®

American Society of Health-System Pharmacists
7272 Wisconsin Avenue
Bethesda, MD 20814
Email: gad@ashp.org
Phone: 301-664-8692

The American Society of Health-System Pharmacists (ASHP) respectfully submits the following statement for the record of the House Government Reform Committee hearing entitled, "Regulation of Dietary Supplements: A Review of Consumer Safeguards."

ASHP is the 30,000-member national professional and scientific association that represents pharmacists who practice in hospitals, health maintenance organizations, long-term-care facilities, and other components of health systems. For more than 60 years, ASHP has helped pharmacists and pharmacy technicians who practice in hospitals and health systems improve medication use and enhance patient outcomes.

According to a survey conducted by the Centers for Disease Control and Prevention, approximately 40 percent of the American public consumes dietary supplements.[1] ASHP believes widespread, indiscriminate use of dietary supplements presents substantial risks to public health. ASHP therefore encourages its members to integrate awareness of dietary supplement use into their everyday practice and to increase efforts to prevent interactions between dietary supplements and drugs. Current federal regulation of the manufacturing and labeling of dietary supplements, however, fails to address the substantial risks posed to public health, leaving both consumers and providers with limited reliable information to make informed decision about dietary supplement use.

In the attached "ASHP Statement on the Use of Dietary Supplements," the Society lays out concerns regarding the current framework for regulating dietary supplements and makes recommendations to help consumers and providers make informed decisions.

ASHP recommends that Congress amend the Dietary Supplement Health Education Act of 1994 (DSHEA) to:

- Require that dietary supplements undergo FDA approval for evidence of safety and efficacy,
- Mandate FDA-approved dietary supplement labeling that describes safe use in a clear, standardized format, including the potential for interaction with medications and cautions for special populations,
- Require FDA to promulgate and enforce good manufacturing practices for dietary supplements,
- Require that dietary supplements meet FDA-established standards for identity, strength, purity, and quality, and
- Empower FDA to establish and maintain an adverse event-reporting system specifically for dietary supplements, and require dietary supplement manufacturers to report suspected adverse reactions to FDA.

The time for congressional action is now. This is true particularly in light of a recent ruling issued by the United States District Court for the District of Utah Central Division,

---

[1] National Health and Nutrition Examination Survey (6/2002), accessed at www.cdc.gov/nchs/data/nhanes/databriefs/dietary.pdf.

in which the court questions the FDA's authority to monitor and regulate dietary supplements. The court overturned the FDA's ban on dietary supplements containing ephedrine alkaloids of 10 mg or less per daily noting that the FDA failed to prove that the risk identified by the FDA are associated with the intake of low doses. The duty currently falls on the FDA to establish a significant risk of illness or injury by a preponderance of the evidence.

ASHP supports congressional efforts to close loopholes in the DSHEA to ensure that consumers and providers have the information necessary to assess the safety and effectiveness of dietary supplements. ASHP appreciates the opportunity to share our views with the committee and stands ready to work with you on this important legislation.

ASHP Statement on the Use of Dietary Supplements

Position

The American Society of Health-System Pharmacists (ASHP) believes that the widespread, indiscriminate use of dietary supplements presents substantial risks to public health and that pharmacists have an opportunity and a professional responsibility to reduce those risks. ASHP recognizes that patients may choose to use legally available dietary supplements, but believes that the decision to use substances that may be pharmacologically active should always be based on reliable information about their safety and efficacy. The current regulatory framework governing dietary supplements does not provide consumers or health care providers with sufficient information on safety and efficacy to make informed decisions. Furthermore, standards for product quality are currently inadequate. ASHP recognizes the concerns raised by the dietary supplement industry regarding regulating dietary supplements as nonprescription drugs because of the industry's inability to patent product ingredients. Still, ASHP urges Congress to amend the Dietary Supplement Health and Education Act of 1994 (DSHEA) to require that the Food and Drug Administration (FDA) develop a regulatory scheme to ensure that dietary supplements are safe and effective. ASHP believes that dietary supplements, at a minimum, should (1) receive FDA approval for evidence of safety and efficacy, (2) meet manufacturing standards for identity, strength, quality, purity, packaging, and labeling, and (3) undergo mandatory postmarketing reporting of adverse events, including drug interactions.

ASHP strongly encourages in vitro and clinical studies of interactions between dietary supplements and medications. Because of the demonstrated risk of these interactions, ASHP discourages the concurrent use of dietary supplements and drug therapy, especially those therapies for which failure may have irreversible consequences (e.g., immunosuppressive therapy, cancer chemotherapy, treatment for human immunodeficiency virus infection, anticoagulation therapy, and hormonal contraceptive therapy).

ASHP believes that the criteria used to evaluate dietary supplements for inclusion in health-system formularies should be as rigorous as those established for nonprescription drugs and that the self-administered use of dietary supplements during a health-system stay may increase risks to patients and liabilities to health care professionals and institutions.

ASHP urges pharmacists and other health care practitioners to integrate awareness of dietary supplement use into everyday practice and encourages pharmacists to increase efforts to prevent interactions between dietary supplements and drugs. ASHP also supports the education of pharmacists and other health care practitioners in the taxonomy, formulation, pharmacology, and pharmacokinetics of dietary supplements and believes that such education should be required in college of pharmacy curricula.

Background

Dietary supplements are defined in DSHEA as products "intended to supplement the diet" that contain vitamins, minerals, herbs or other botanicals, amino acids; "a dietary substance for use by man to supplement the diet by increasing the total daily intake"; or "a concentrate, metabolite, constituent, extract, or combinations of these ingredients."[1]

Evidence of variability in dietary supplement content[2–8] has spurred efforts to standardize products. Current federal regulations regarding the manufacture of dietary supplements are not adequate.[9] Some manufacturers voluntarily follow good manufacturing practices (GMPs) devised by their own trade groups (e.g., the National Nutritional Foods Association GMP Certification Program[10]), and the U.S. Pharmacopeia (USP) has created voluntary standards for a handful of dietary supplements.[11] Manufacturers that wish to carry the "USP approved" seal on their product labels have to subject their products to testing by USP. The creation of these voluntary programs reflects a widespread concern, even on the part of dietary supplement manufacturers, that production processes must be regulated. Although FDA has had the authority to establish dietary supplement GMPs for almost a decade, it issued its first proposed rule on the topic in 2003.[12]

DSHEA does not require FDA to review evidence of the efficacy or safety of dietary supplements, so manufacturers have no burden to prove that their products are effective or safe. Although dietary supplement labeling cannot claim activity in the treatment of a specific disease or condition, claims that suggest an effect on the "structure or function of the body" are allowed.[1] For example, dietary supplements containing echinacea can be labeled as supporting immune health (as a "function") but cannot be labeled as preventing or ameliorating colds (treating a disease). Regardless of this distinction between function and treatment, consumers are bombarded by the lay press (and even some scientific literature) with what can only be described as specific-disease indications for dietary supplements (e.g., glucosamine for osteoarthritis, black cohosh for menopausal symptoms, and St. John's wort for depression).

The health claims allowed in dietary supplement labeling by current interpretation of DSHEA create further confusion for consumers. FDA's attempt to hold these health claims to the same scientific standard required for conventional foods was struck down in *Pearson* v. *Shalala,* so FDA must permit dietary supplement labels to carry "qualified" health claims based on equivocal scientific evidence.[13]

Although DSHEA does require that dietary supplements be safe, it does not require prospective testing to ensure safety. To remove a product from the market, FDA must prove that the product is unsafe. Under DSHEA, some dietary supplements that were banned from the U.S. market because of concerns about their safety have been allowed to return (e.g., sassafras tea, dehydroepiandrosterone). Demonstrably unsafe products have made their way onto the market, and fatal adverse reactions have been reported.[14,15]

Establishing the safety record of dietary supplements has been complicated by the lack of systematically collected data about their adverse reactions. The MedWatch system has been used to a limited extent to report adverse events related to dietary supplement use, but, nine years after the passage of DSHEA, FDA is still developing an adverse-reaction-reporting system for dietary supplements. Despite the limited data, however, the number of case reports of interactions between dietary supplements and medications is growing.[16–21] The safety of dietary supplements for special populations (e.g., children, pregnant women, people with impaired organ or immunologic function) has also not been demonstrated.

Dangers to Public Health

It has been estimated that 40% of the U.S. population uses dietary supplements often and that almost twice as many have used at least 1 of the estimated 29,000 dietary supplements on the market.[22] Out-of-pocket expenditures on dietary supplements total approximately $18 billion annually.[23] Such widespread and indiscriminate use of dietary supplements presents five dangers to the public health:

1. Some dietary supplements are inherently unsafe when ingested orally (e.g., chaparral, ephedra, comfrey, tiractricol, aristolochic acid, pennyroyal).[24–28]
2. Lax regulation of dietary supplement manufacturing presents the risk of contamination or adulteration with harmful substances, including carcinogens,[29–32] and of dangerous variability in active ingredient content among products.[2–8]
3. The use of dietary supplements may compromise, delay, or supplant treatment with therapies of proven efficacy.[16–21,25]
4. Dietary supplements may present dangers to speci al populations (e.g., children, pregnant women, patients undergoing surgery, patients with impaired organ or immunologic function).
5. Spending on dietary supplements represents an enormous health-related expenditure of unsubstantiated value.[33]

Since the mid-19th century, the federal government has exercised its responsibility to protect Americans from hazardous or adulterated foods and medicines. ASHP believes that, with the passage and implementation of DSHEA, the federal government has abandoned its duty to create a regulatory scheme for dietary supplements that adequately protects the health of consumers. Under DSHEA, consumers and health care practitioners are not provided with the information they need to use dietary supplements safely. To reduce the dangers posed by the current regulatory framework, Congress should amend DSHEA to

1. Require that dietary supplements undergo FDA approval for evidence of safety and efficacy,
2. Mandate FDA-approved dietary supplement labeling that describes safe use in a clear, standardized format, including the potential for interaction with medications and cautions for special populations,
3. Require FDA to promulgate and enforce GMPs for dietary supplements,
4. Require that dietary supplements meet FDA-established standards for identity, strength, purity, and quality, and
5. Empower FDA to establish and maintain an adverse-event-reporting system specifically for dietary supplements, and require dietary supplement manufacturers to report suspected adverse reactions to FDA.

Implications for Practice

Although examples of persons rejecting potentially life-saving medical interventions in favor of alternative therapies can be found in the medical and lay press,[34] the presumption that most users of dietary supplements reject traditional treatments is unfounded. One survey found that most individuals who use alternative therapies for a specific symptom or disease are also receiving care and prescription medications from a physician or surgeon.[35] In a more recent nationwide survey, almost 20% of adults taking prescription drugs reported that they were taking at least one dietary supplement, not including vitamin or mineral supplements.[36]

Pharmacists and other health care practitioners therefore have an opportunity to reduce the risks associated with dietary supplement use. Health care providers face unfamiliar challenges in this effort, however, because much of the information they typically use to establish pharmaceutical treatment regimens is lacking for dietary supplements. Product content is not standardized, therapeutic goals are vague, and evidence of efficacy and safety is absent or ambiguous. ASHP believes that pharmacists, as medication-use experts and accessible members of the health care team, are uniquely qualified and positioned to counsel patients using or considering the use of dietary supplements. Despite their professional responsibility to provide patients with sound advice, pharmacists (like other health care providers) are frustrated by the lack of reliable information about the safety and efficacy of dietary supplements. Pharmacists have shown that they can improve medication safety by identifying and preventing adverse drug events,[37] and they could play a similar role in preventing adverse events due to dietary supplement use if they had sound, evidence-based professional resources.

Incorporate Awareness of Dietary Supplement Use into Practice. ASHP urges pharmacists and other health care practitioners to integrate awareness of dietary supplement use into everyday practice. ASHP believes that all health systems should have an institutional policy regarding the use of dietary supplements. Such policies should allow pharmacists and other health care practitioners to exercise their professional judgment and try to balance patient autonomy and institutional concerns.

Patient Counseling. Although most consumers of alternative therapies also take prescription medications,[35] one survey found that 72% of respondents who used alternative therapies did not report that use to their health care providers.[38] Pharmacists and other health care practitioners must therefore routinely inquire about a patient's current or planned use of dietary supplements, providing examples so that patients understand what is meant (e.g, asking "Do you use dietary supplements, such as St. John's wort or gingko?").[39] This information will allow pharmacists and other health care practitioners to counsel the patient about dietary supplement use and monitor for adverse reactions and drug interactions.

When counseling patients about dietary supplements, the concept of *caveat emptor* (buyer beware) must be emphasized because the content and safety of dietary supplements are not well regulated. ASHP believes that all pharmacists, at a minimum, should be familiar with the pharmacology and pharmacokinetics of common dietary supplements that might contraindicate concurrent use with a therapeutic regimen (i.e., proven and potential pharmacokinetic and pharmacodynamic interactions with prescription and nonprescription medications) to the extent that sound evidence exists. To provide informed counsel to patients using or considering the use of dietary supplements, pharmacists further need to be familiar with the following:

- The typical uses of common dietary supplements and the scientific literature regarding their efficacy and safety,
- The proven and potential interactions between common dietary supplements and prescription and nonprescription medications,
- The methods of therapeutic monitoring for common dietary supplements, including signs and symptoms of potential adverse effects and toxicities,
- The proven and potential effects of certain disease states on supplement absorption, distribution, and elimination, and
- The safety of using dietary supplements before or after surgery.

Despite the shortcomings of the data on dietary supplements, the limited references on the topic that are available should be consulted.[40–45]

Patients stabilized on a combination of a supplement and medication should be cautioned not to suddenly discontinue the use of either without first consulting with the prescriber. The potential for adverse effects from an interaction exists both when a dietary supplement is discontinued and when it is initiated.

Dietary supplement sales have a very high potential for profit. Despite the expectation that pharmacies should receive a profit from the sale of products, professional ethics mandate that any recommendations or purchasing suggestions be made with the well-being of the customer or patient as the primary concern. Pharmacists should also review promotional and reference materials promulgated in or by their workplaces to ensure that these materials are evidence based and not misleading or deceptive. The scientific literature about the safety and efficacy of dietary supplements is updated continually. Pharmacists have a responsibility to continually monitor that literature and incorporate the evolving knowledge into their care for and advice to patients.

Inclusion in Formularies. ASHP believes that the criteria used to evaluate dietary supplements for inclusion in health-system formularies should be as rigorous as those established for prescription and nonprescription drugs. The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) has recommended that medical staff weigh the patient care implications of dietary supplements with the same rigor applied to prescription and nonprescription medications,[46] and all JCAHO medication management standards apply to dietary supplements, as well as prescription and nonprescription drugs.[47] ASHP believes that the decision to include any product in a health-system formulary should be based on comparative data regarding efficacy, adverse effects, cost, and potential therapeutic advantages and deficiencies.[48] The lack of definitive evidence of efficacy and safety and the demonstrated variability in product content make most dietary supplements unsuitable for inclusion in health-system formularies.[49] More research is needed to determine the relative effectiveness of dietary supplements and their safety for all patient populations, especially drug–supplement interactions.

The shortcomings that make most dietary supplements unsuitable for inclusion in formularies also argue strongly against their self-administered use by patients during a health-system stay. ASHP believes that the use of self-administered medications should be avoided to the extent possible[50] and that pharmacists should identify all drug products before their use.[15] There is currently no way to definitively determine the content of dietary supplements brought into health systems. In addition, discontinuing supplement use may be advisable as part of the diagnostic workup, and the possibility that supplement use may have contributed to hospitalization should be considered.

If an institution decides, as a matter of patient autonomy, to allow the use of dietary supplements, such use should require a prescribed order for the specific dietary supplement in the patient medical record and pharmacist review and verification of the order. Health systems should be aware that the use of dietary supplements may expose patients to risks, and the health system and staff should take steps to reduce potential liability (e.g., require patients to sign a liability waiver for dietary supplement use) and decrease those risks.

Conclusion

Current regulation of the manufacture and labeling of dietary supplements fails to address substantial risks to the public health. As the activity of some dietary supplements has become apparent, so have their dangers and the shortcomings of the current regulatory framework. These laws and regulations should be revised, with the primary goal of providing consumers and health care practitioners with the information they need to use dietary supplements safely and effectively. In short, dietary supplements should be regulated in a manner that ensures that they are safe and effective. Regardless of the shortcomings of the current regulatory framework, pharmacists have an opportunity and a professional responsibility to reduce the risks presented by dietary supplement use.

References

1. Dietary Supplement Health and Education Act of 1994 (SB 784). http://thomas.loc.gov/ (accessed 2003 Apr 1).
2. Gurley BJ, Wang P, Gardner SF. Ephedrine-type alkaloid content of nutritional supplements containing *Ephedra sinica* (Ma-huang) as determined by high performance liquid chromatography. *J Pharm Sci.* 1998; 87:1547–53.
3. Harkey MR, Henderson GL, Gershwin ME, et al. Variability in commercial ginseng products: an analysis of 25 preparations. *Am J Clin Nutr.* 2001; 73:1101–6.
4. Parasrampuria J, Schwartz K, Petesch R. Quality control of dehydroepiandrosterone dietary supplement products. *JAMA.* 1998; 280:1565. Letter.
5. Feifer AH, Fleshner NE, Klotz L. Analytical accuracy and reliability of commonly used nutritional supplements in prostate disease. *J Urol.* 2002; 168:150–4.
6. De los Reyes GC, Koda RT. Determining hyperforin and hypericin content in eight brands of St. John's wort. *Am J Health-Syst Pharm.* 2002; 59:545–7.
7. Glisson JK, Rogers HE, Abourashed EA, et al. Clinic at the health food store? Employee recommendations and product analysis. *Pharmacotherapy.* 2003; 23:64–72.
8. Gurley BJ, Gardner SF, Hubbard MA. Content versus label claims in ephedra-containing dietary supplements. *Am J Health-Syst Pharm.* 2000; 57:963–9.
9. Fontanarosa PB, Rennie D, DeAngelis CD. The need for regulation of dietary supplements—lessons from ephedra. *JAMA.* 2003; 289:1568–70. Editorial.

10. National Nutritional Foods Association. NNFA GMP certification program overview. www.nnfa.org/services/science/gmp.htm (accessed 2003 Dec 12).
11. U.S. Pharmacopeia. U.S. Pharmacopeia dietary supplement verification program. www.usp-verified.org (accessed 2004 May 13).
12. Food and Drug Administration. Current good manufacturing practice in manufacturing, packing, or holding dietary ingredients and dietary supplements. Proposed rule. *Fed Regist.* 2003; 68:12157–263.
13. *Pearson* v. *Shalala,* 164 F.3d 650 (D.C. Cir. 1999).
14. Food and Drug Administration. Illnesses and injuries associated with the use of selected dietary supplements. www. cfsan.fda.gov/~dms/ds-ill.html (accessed 2003 Feb 14).
15. Palmer ME, Haller C, McKinney PE, et al. Adverse events associated with dietary supplements: an observational study. *Lancet.* 2003; 361:101–6.
16. Williamson EM. Drug interactions between herbal and prescription medicines. *Drug Saf.* 2003; 26:1075–92.
17. Fugh-Berman A. Herb–drug interactions. *Lancet.* 2000; 355: 134–8.
18. Yue QY, Bergquist C, Gerdén B. Safety of St. John's wort (*Hypericum perforatum*). *Lancet.* 2000; 355:576–7. Letter.
19. Brazier NC, Levine MA. Drug–herb interaction among commonly used conventional medicines: a compendium for health care professionals. *Am J Ther.* 2003; 10;163–9.
20. Izzo AA, Ernst E. Interactions between herbal medicines and prescribed drugs: a systematic review. *Drugs.* 2001; 61:2163–75.
21. Piscitelli SC, Burstein AH, Chaitt D, et al. Indinavir concentrations and St. John's wort. *Lancet.* 2000; 355:547–8. Letter. [Erratum, *Lancet.* 2001;357:1210.]
22. Office of the Inspector General. Dietary supplement labels: key elements. Report OEI-01-01-00120. http://oig.hhs.gov/oei/reports/oei-01-01-00120.pdf (accessed 2004 May 13).
23. Annual overview of the nutrition industry VII. *Nutr Bus J.* 2002; 7(May/Jun):1–11.
24. Food and Drug Administration. Dietary supplements: warnings and safety information. www.cfsan.fda.gov/~dms/ds~warn.html (accessed 2004 May 21).
25. De Smet PA. Herbal remedies. *N Engl J Med.* 2002; 347:2046–56.
26. Blumenthal M, ed. The complete German Commission E monographs—therapeutic guide to herbal medicines. Austin, TX: American Botanical Council; 1998:116,125–6.
27. Nortier JL, Martinez MC, Schmeiser HH, et al. Urothelial carcinoma associated with the use of a Chinese herb (*Aristolochia fangchi*). *N Engl J Med.* 2000; 342:1686–92.
28. Shekelle PG, Hardy ML, Morton SC, et al. Efficacy and safety of ephedra and ephedrine for weight loss and athletic performance: a meta-analysis. *JAMA.* 2003; 289:1537–45.
29. Slifman NR, Obermeyer WR, Musser SM, et al. Contamination of botanical dietary supplements by *Digitalis lanata. N Engl J Med.* 1998; 339:806–11.
30. Food and Drug Administration. Letter to health care professionals: FDA concerned about botanical products, including dietary supplements, containing aristolochic acid. http://vm.cfsan.fda.gov/~dms/ds-botl2.html (accessed 2003 Apr 1).
31. De Smet PA. Toxicological outlook on the quality assurance of herbal remedies. In: De Smet PA, Keller K, Hansel R, et al., eds. Adverse effects of herbal drugs. Vol. 1. Berlin: Springer-Verlag; 1992:1–72.
32. De Smet PA. The safety of herbal products. In: Jonas WB, Levin JS, eds. Essentials of complementary and alternative medicine. Philadelphia: Lippincott Williams & Wilkins; 1999:108–47.
33. De Smet PA. Health risks of herbal remedies. *Drug Saf.* 1995; 13:81–93.
34. Eisenberg DM, Davis RB, Ettner SL, et al. Trends in alternative medicine use in the United States, 1990–1997: results of a follow-up national study. *JAMA.* 1998; 280:1569–75.
35. Astin JA. Why patients use alternative medicine: results of a national study. *JAMA.* 1998; 279:1548–53.
36. Kaufman DW, Kelly JP, Rosenberg L, et al. Recent patterns of medication use in the ambulatory adult population of the United States: the Slone survey. *JAMA.* 2002; 287:337–44.
37. Leape LL, Cullen DJ, Clapp M, et al. Pharmacist participation on physician rounds and adverse drug events in the intensive care unit. *JAMA.* 1999;282:267–70.
38. Eisenberg DM, Kessler RC, Van Rompay MI, et al. Perceptions about complementary therapies relative to conventional therapies among adults who use both: results from a national survey. *Ann Intern Med.* 2001; 135:344–51.
39. Ang-Lee MK, Moss J, Yuan CS. Herbal medicines and perioperative care. *JAMA.* 2001; 286:208–16.
40. Chambliss WG, Hufford CD, Flagg ML, et al. Assessment of the quality of reference books on botanical dietary supplements. *J Am Pharm Assoc.* 2002; 42:723–34.
41. Haller CA, Anderson IB, Kim SY, et al. An evaluation of selected herbal reference texts and comparison to published reports of adverse herbal events. *Adverse Drug React Toxicol Rev.* 2002; 21:143–50.
42. Kemper KJ, Amata-Kynvi A, Sanghavi D, et al. Randomized trial of an internet curriculum on herbs and other dietary supplements for health care professionals. *Acad Med.* 2002; 77:882–9.
43. Sweet BV, Gay WE, Leady MA, et al. Usefulness of herbal and dietary supplement references. *Ann Pharmacother.* 2003; 37:494–9.
44. Office of Dietary Supplements. International Bibliographic Information on Dietary Supplements (IBIDS) database. http://ods.od.nih.gov/showpage.aspx? pageid=48 (accessed 2003 Dec 11).
45. Memorial Sloan-Kettering Cancer Center. AboutHerbs Web site. www.mskcc.org/mskcc/html/11570.cfm (accessed 2003 Dec 11).
46. Rich DS. Ask the Joint Commission: understanding JCAHO requirements for hospital pharmacies. St. Louis: Facts and Comparisons; 2002:132–3.
47. Medication management standards. In: Comprehensive accreditation manual for hospitals, 2004 update. Oakbrook Terrace, IL: Joint Commission on Accreditation of Healthcare Organizations; 2004:MM1–20.
48. American Society of Hospital Pharmacists. ASHP technical assistance bulletin on the evaluation of drugs for formularies. *Am J Hosp Pharm.* 1988; 45:386–7.

49. Ansani NT, Ciliberto NC, Freedy T. Hospital policies regarding herbal medicines. *Am J Health-Syst Pharm.* 2003; 60:367–70.
50. American Society of Hospital Pharmacists. ASHP technical assistance bulletin on hospital drug distribution and control. *Am J Hosp Pharm.* 1980; 37:1097–1103.
51. American Society of Health-System Pharmacists. ASHP guidelines: minimum standard for pharmacies in hospitals. *Am J Health-Syst Pharm.* 1995;52:2711–7.

Approved by the ASHP Board of Directors on April 14, 2004, and by the ASHP House of Delegates on June 20, 2004. Developed through the ASHP Council on Professional Affairs. Supersedes ASHP policies 0223, 0304, and 0324.

Copyright © 2004, American Society of Health-System Pharmacists, Inc. All rights reserved.

The bibliographic citation for this document is as follows: American Society of Health-System Pharmacists. ASHP Statement on the Use of Dietary Supplements. *Am J Health-Syst Pharm.* 2004; 61:1707–11.