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HEALTH BENEFITS OF SOY

In the last several years, publicity about soy has greatly increased. But what is all the fuss about? With so many different opinions on soy, we want to set the record straight.

In the United States, soybeans were first introduced in Georgia, where Samuel Bowen began planting soybeans on his plantation in the 1760s. He also patented processes to make soy sauce and vermicelli (soy noodles), and almost 250 years later, pastas made with soy were introduced into the American marketplace.

Innovations in soyfood processing have created an array of soy-based foods that appeal to infants, children and adults. In 1999, the Food and Drug Administration approved a soy health claim that states 25 grams of soy protein a day, as part of a diet low in saturated fat and cholesterol, may reduce the risk of heart disease. From 2000 to 2007, food manufacturers in the U.S. introduced over 2,700 new foods with soy as an ingredient, including 161 new products introduced in 2007 alone.

The soy protein content of soy-

foods varies from as little as 1-2 grams per serving to 18-20 grams per serving. On average, one can obtain 25 grams of soy protein by consuming three to four servings of soyfoods per day. Products that carry the FDA authorized health claim on the label must contain at least 6.25 grams of soy protein per serving, but usually contain much more.

The United Soybean Board reported that in 2008, 85 percent of consumers rated soy products as healthy—an increase of 26 percentage points since 1997. Emerging research continues to illustrate that one of the biggest benefits of adding soy to the diet is that the protein found in soy is the only complete plant protein that is equivalent to animal protein. Soyfoods contain all nine essential amino acids in the ratios needed for human growth and health, and they are readily digestible. Soyfoods are also rich in vitamins and minerals, including folate, potassium and fiber.

Within the past 15 years, soy has attracted the attention of researchers for its potential to reduce risk for chronic disease. One important reason for this interest is that soyfoods are low in saturated fat and are cholesterol-free. According to the American Heart Association, “soy products such as tofu, soy butter, soy nuts, or some soy burgers should be beneficial to cardiovascular and overall health because of their high content of polyunsaturated fats, fiber, vitamins, minerals and low content of saturated fat and no cholesterol.”

Though more research is needed, findings suggest that soyfoods may reduce the risk of coronary heart disease, osteoporosis and certain cancers, and may help alleviate menopausal symptoms.

Soyfoods have also been proven to lower the risk of developing breast cancer in women when compared to women who don’t consume soyfoods. In a study done by the National Cancer Institute that showed a protective effect of soy



Marilyn Nash, NSRL Program Coordinator, whips up a soy smoothie using tofu in the test kitchen at the University of Illinois

against breast cancer, the median intake of soy among those who consumed the most soy was two times per week for adults, three times per week for adolescents and two-and-a-half times per week for children. Eating soyfoods early in life may be one of the factors that explains why Asian women have lower breast cancer rates, as low as one-fifth that of Western women.

There continues to be debate on the safety and nutritional value of soyfoods.

Given the volume of research that has been conducted on soy, it is not surprising that some studies show adverse effects. However, focusing on only these few studies gives a skewed perception of the safety of soyfoods. When evaluating soyfood research, it is important to keep in mind that many studies also show soyfoods to be safe and an important part of a healthy diet.

Most of the studies showing undesirable effects of soy are in vitro studies

or have been conducted in animals, so their relevance to humans should be considered with caution. In vitro conditions can't duplicate the complexity of living organisms and many of these studies examine the effects of isolated compounds, which are often very different from the effects seen in their natural environment. This is because the biological impact of one nutrient or non-nutrient in a food can be dependent upon the presence of others.

This is not to suggest that all in vitro and animal data should be ignored; however, when evaluating soyfood research, it is important to draw conclusions about soy health effects that are based on human data.

Stacey Krawczyk, NRS� Research Dietitian, suggests that when evaluating soyfood research; make sure it is based on soyfood consumption rather than consumption of an isolated soy component.

It's true; the research that has been done on soyfoods can be overwhelming, but the majority of studies have proven that implementing the right amount of soy into a healthy diet is beneficial. It's also easy to do, according to Krawczyk.

"Soy is adaptable and easy to use in meals," she said. "I call it the flavor chameleon. Soy is relatively bland, so when you put it in other foods it takes on the flavor of those foods."

Krawczyk said that tofu can be used as an alternative to cream cheese and sour cream, or used as an egg substitute. Soymilk can also replace cow's milk and be used to reduce the cholesterol content of any recipe. Most soy products can be found at any local grocery store; however, if they don't have something, "just ask", said Krawczyk.

"Soy is an excellent opportunity to add variety to our diets and we should take advantage of it." ■

WHY CHOOSE SOY?

Good Nutrition

High quality protein: Soy has all the essential amino acids that people need.

Vitamins: Soy is a good source of B vitamins, including folate.

Fiber: Some soy foods, including edamame, dried soybeans, soy flour and textured vegetable protein, are very high in fiber.

Essential fatty acids: Soy contains linolenic acid and also the essential omega-3 fatty acid, alpha-linolenic acid.

Phytochemicals: Soy contains many biologically active substances that may help prevent chronic disease.

Prevention or treatment of chronic disease

Heart disease: The FDA approved soy health claim states that 25 grams of soy protein a day as part of a diet low in saturated fat and cholesterol

may reduced the risk of heart disease. Soy may also help keep blood vessels healthy and help control blood pressure.

Cancer: Soy contains at least five phytochemicals that may help prevent or slow the progression of some cancers. Current research is promising that soy may help protect against prostate cancer.

Osteoporosis: Recent studies have shown that soy may be helpful in preventing bone loss, although long-term studies are still needed.

Diabetes: Soy foods may help keep blood glucose levels under control. Soy protein may also reduce the risk of developing kidney disease and heart disease, both of which are common in diabetics.

Weight control: Soy is low in calories and high in nutrition. When soy replaces higher-fat foods, it reduces the overall fat content of the diet. ■



YIELD CHALLENGE

Sponsored by the Illinois Soybean Association, the 2010 Yield Challenge will work to identify the innovative management practices used to produce the highest soybean yields and recognize the top soybean growers in Illinois.

Growers who produce soybeans within Illinois state boundaries are encouraged to participate. Each grower must be a member of a team including 5-10 participants, and each participant will set up two side-by-side plots. One plot will receive the grower's normal management practices, and the Challenge plot will receive the innovative, high-yield strategies. All production practices will be recorded and reported.

At harvest, all team members will conduct a yield check. For each team, the average of the five highest yielding plots will be used to determine the final Challenge yield for each team. Illinois will be sectioned into nine Yield Challenge districts and the teams with the highest average yield in each district will be rewarded.

For more information on how to enter, log on to: www.soyyieldchallenge.com ■

SOYMILK YOU CAN USE



One cup of soy milk contains 120 calories and over 6 grams of protein. It is a perfect choice for a healthy lifestyle.

Whether you drink it, pour it over your cereal, or use it in cooking and baking, soy milk fits well into a healthy diet. It is low in saturated fat and provides a variety of essential vitamins and minerals, and its soy protein and isoflavones help keep you healthy.

Soy milk is:

- Naturally low in saturated fat and cholesterol free
- A good source of high-quality protein
- May provide health benefits beyond basic nutrition
- Lactose and casein free
- Available in many delicious flavors

You may want to sample several brands of soy milk to find the one you like best. Test the soy milk by using it the way you normally would use milk - by pouring it over cereal, making a smoothie, drinking a glass or using it in cooking. You may find that you like a variety of flavors for drinking and a plain or vanilla soy milk for cereal and cooking. Consider the following:

1. Taste. Try different flavors—vanilla, chocolate, carob, chai, eggnog. Not only do flavors vary, but brands vary considerably in their taste and mouthfeel.

2. Convenience. Soy milk comes in refrigerated cartons or in aseptically packaged containers that do not have to be chilled until they are open. You may find quart, half-gallon or single-serving containers. Powdered soy milk is also available.

3. Health. A 1-cup serving of most varieties of soy milk has at least 6.25 grams of soy protein. Always check the Nutritional Facts label because different brands and flavors of soy milk will have different amounts of calories, protein, and fat. If you are using soy milk to replace cow's milk, choose a variety that is fortified with calcium (at least 30 percent of the Daily Value) and vitamin D.

Soy milk is available in the dairy case of most supermarkets. You can also find soy milk in health or natural foods stores, or those sections of your grocery store. Different stores may carry different brands—if you don't see what you want, ask for it! ■

Recipe: Winter Soup (from Soy Accessible)

- 1 package (12 oz) frozen winter squash, thawed (in microwave)
- 1 can (15 oz) cream-style corn
- 1 ½ cups water
- 1 cup plain soy milk
- 1 tsp chicken or vegetable broth powder
- ½ tsp dried thyme leaves
- ¼ tsp black pepper
- Croutons (optional)

1. Combine all ingredients except the croutons in a large saucepan. Whisk together and cook over medium heat, stirring occasionally, until mixture just comes to a boil.
2. Serve at once topped with croutons, if desired. Note—bread cubes from a package of stuffing mix can be used as quick croutons.

Per serving (1 cup): 160 Calories, 5 grams Protein, 33 grams Carbohydrate, 1.5 grams of fat

For more recipes using soy ingredients, log on to: www.nsrll.illinois.edu.



SERVING UP SOY IN VIETNAM

NSRL and FaifoSoy, a newly formed Vietnamese company, are collaborating to provide soy milk and soy enriched baked goods for the people of Vietnam. FaifoSoy is also supplying other high protein soy-based foods to the market, providing employment for local women and donating a portion of their production to local schools and hospitals.

“The need for protein solutions in Vietnam is significant,” said Bridget Owen, associate director of NSRL. “We are pleased to work together with FaifoSoy to help fill Vietnam’s growing protein requirement through soy.”

NSRL and FaifoSoy have also been working with Dr. John LeVan, president of the United States Vietnam Foundation, to provide soy to school children in the Danang area who have a nutritional protein deficit due to economic reasons.

Phan Le Thanh Hoa, a primary school teacher in Danang City said: “Since over a month, my family, along with a number of children and their parents, have been given the opportunity of tasting the soy milk and soy-enriched foods produced by FaifoSoy. The products are very tasteful with attractive aroma and without any other fatty ingredients, therefore their quality is excellent. The prices are most reasonable for everyone, especially for students on limited allowance.”

FaifoSoy supplies soy dairy and soy baked goods that use 15 percent soy flour to the marketplace in the form of muffins, cookies and pound cakes. Do Huy Hoang, managing director of FaifoSoy, acknowledged the continuing support of USVNF and the technical and processing advisors at NSRL. All have been instrumental in helping overcome obstacles, delivering instruction and guidance regarding FaifoSoy endeavors.

FaifoSoy staff and Dr. Levan recently traveled to NSRL and participated in an in-depth, hands-on training and workshops for soy milk production and soy applications in baking. They also conducted training sessions in Danang for Vietnamese entrepreneurs about soy’s value and its many uses. NSRL staff served as facilitators during the workshops where participants learned about soy nutrition and processing techniques.

“In Vietnam, malnutrition contributes directly to increased poverty and, in the long run, it can have a negative impact on Vietnamese economic growth as well as the future health and



Vietnamese entrepreneurs learn about soy’s value and develop soy applications for baking.

well-being of its children,” said Owen.

This project is supported by Illinois soybean checkoff dollars and is creating a new market for soy milk and soy baked goods along with generating jobs for local women. NSRL international programs have the common theme to provide nutritional support and soy-based products in areas like Vietnam and around the world that face extreme challenges of malnutrition and chronic disease. ■



Do Huy Hoang, FaifoSoy Managing Director, learns the intricacies of producing soymilk using a SoyCow.

THE VARIETAL INFORMATION PROGRAM FOR SOYBEANS

The Varietal Information Program for Soybeans (VIPS) can help you win the battle to maximize soybean yields and profit per acre for your farming operation. VIPS is a virtual weapon in the arsenal to assist soybean growers in selecting the highest yielding, disease resistant, and highest protein and oil soybean varieties.

Annually, over 60 companies participate in the state variety trials and send over 600 varieties spanning five maturity groups to be evaluated. Additionally, scientists and researchers screen all varieties for resistance to diseases and pests. The VIPS provides this information online for the agricultural community to use when making production decisions.

“Yield is a key component of the farm profitability picture, and the environment is one of the most important determinants of yield,” said Linda Kull, agricultural research specialist at the National Soybean Research Laboratory. “Most varieties in the VIPS database are grown at three to six locations. The highest yielding variety for 2009 produced 81.5 bushels per acre at the New Berlin location and 56.6 bushels per acre at the DeKalb location. The DeKalb location received four more inches of rain than the New Berlin location. Although other environmental factors including soil composition contributed to the yield differences in these two locations, having access to yield data that shows performance of varieties not only across companies but also across locations is a valuable resource.” The VIPS information can be imported into your spreadsheet program, you can sort by many different attributes including highest to lowest yield. Typically, most varieties are available for purchase from seed companies for only

2-3 years. VIPS includes information for the past 11 years, so the VIPS user can view several years of data for most varieties. If you are interested in non-genetically modified varieties that may bring a premium of up to \$2, the VIPS include production information for over 130 non-GMO varieties. Also, yield data for over 25 Liberty Link varieties are included in the VIPS. You also can receive the VIPS database in a booklet format. The VIPS booklet is distributed with the December Illinois Soybean Review magazine and as a handout at most of the winter farm meetings including the Corn and Soybean Classics.

“Variety selection is typically the most important decision a soybean grower makes, and it’s important for growers to have access to information from a diversity of sources. The VIPS delivers a non-company perspective and is always available online...always at the growers’ fingertips,” said Kull. “The grower knows very well his/her production challenges, and time management is always important. The VIPS is a time-saving one-stop source, a decision-support tool for the soybean community.”

The VIPS reveals many opportu-

nities to see big yield and performance differences among varieties. For example, select any location, sort the data by yield and look at the top 10 and the bottom 10 varieties. If you calculate the dollar per acre difference between these top and bottom varieties, you can see nearly \$100 per acre differences—are you considering any of the lower-yielding varieties for 2010?

The VIPS also reveals big differences within maturity groups. For example, when comparing Group II varieties at the Dwight location there was a 21.3 bushel variation between the top yielding variety and the lowest yielding variety. And, when comparing Group II varieties at all locations, the difference in highest and lowest yields increased to 27.3 bushels. “This level of varietal comparison cannot be accomplished at any single company website,” says Kull.

VIPS also allows you to compare variety performance characteristics for all major yield-reducing diseases and pests found in Illinois soybean fields. For soybean cyst nematode, not all varieties in the marketplace labeled “SCN resistant” are actually resistant! VIPS allows you to identify varieties with effective resistance to the SCN Type attacking soybean roots in your soils. Soil samples from your field can be tested for the SCN Type, and the VIPS can help you select resistant varieties for the specific SCN Type in your fields. The benefit—increase your soybean yield 5-8 bushels per acre!

VIPS can save many hours of pouring through plot and company data and help you make informed varietal choices that can put you in a good position to increase your profit and win the production battles. Start today by visiting: www.vipsoybeans.org. ■

EXECUTIVE DIRECTOR'S MESSAGE:



Happy New Year to everyone. 2009 was another banner year for NSRL. The team outdid themselves expanding programs, bringing online new opportunities, and all while focusing NSRL on its mission of profitability for soybean producers. Here is a sample of our year.

We welcomed four new team members to NSRL: Stacey Krawczyk, Registered Dietician, works in the soy foods area and is a key member of the Illinois Center for Soy Foods, located at NSRL. Nick Scates and Courtney Tamimie are recent graduates, Agricultural Economics and French respectively, and are key leads in our twelve international development projects. Dr. Pascasie Adedze, recently received her PhD from the University of Illinois from the Department of Food Science and Human Nutrition. Her expertise is international nutrition and she is already leading two projects in Rwanda and providing support to a number of our international projects.

Thanks to generous funding from the soybean checkoff dollars in Illinois and around the United States, NSRL now operates projects in 13 countries to help combat malnutrition and create new markets for U.S. soy.

Dr. Linda Kull began several years ago helping NSRL and its stakeholders think about the importance of soybean yield research as land availability

declines around the world, but demand keeps growing. One exciting new endeavor in partnership with the great team at the Illinois Soybean Association (ISA) will be the Illinois Soybean Yield Challenge <http://www.soyyieldchallenge.com/> in 2010. This event held all around the state will encourage innovative groups to explore and share new and different ways to boost yield.

Under the direction of Dan Erickson and Melinda Anderson a new unique biodiesel curriculum was produced and is now on the market. These two entrepreneurs are targeting middle school and high school teachers by offering a turnkey curriculum on the science of biodiesel production and bioenergy. <http://www.nsrll.uiuc.edu/news/pressreleases.html#Biodiesel>

The NSRL team has tackled this problem by developing volumes of recipes for consumers and the food service industry to make use of soy's versatility. NSRL's Stacey Krawczyk and Marilyn Nash, supported by ISA, are expanding our services by working directly with the Midwest Food Bank to help them provide recipients with easy to prepare recipes using donated textured soy protein.

NSRL's Associate Director Bridget Owen helped cut the ribbon on a new soy microenterprise in Da Nang, Vietnam. Thanks to the generous funding from ISA and working with the industry for three years resulted in the development of this new small soy-based business.

Five years worth of effort by NSRL's Vijaya Jain, former Associate Director Pradeep Khanna, and Bridget Owen along with support from ISA has helped the Akshaya Patra Foundation surpass 840,000 children fed a hot school lunch fortified with soy in 2009. The school lunches include soy flour and soy granules.

The late harvest affected NSRL and the Department of Crop Sciences as we hustled to publish on time our newest soybean varietal performance results. Check out <http://www.vipsoybeans.org>. See the performance results on 149 conventional and 500 RR varieties tested on 13 locations throughout the state.

Global Food in 3-D tm, NSRL's new visualization software moved towards commercialization in 2009. The original research generously funded by the Illinois Soybean Association explored how dynamic modeling, comprehensive forecasting, and animated visualization could help growers, policymakers, analysts, teachers, and students make sense of the ever changing global food system. The web-based software will be offered on a subscription basis. A Spanish version will soon be released along with add-ons: Global Nutrition in 3-D, Global Energy in 3-D, and Global Water in 3-D.

There is so much still to add, but I had better stop there. I want to express my appreciation to those I have mentioned above and also to Scott Buchanan, Tad Masuda, Carol Neilson, Shailesh Patel, Karl Weingartner, Lynn Westgren and Janet Wiegel. It has been a pleasure working with all of you. It has been a great year, and only due to the hard work and commitment of the NSRL staff could it all be possible. With sadness this will be my last Director's message. As of December first I have left NSRL and become the Director (Interim) of the Food and Agribusiness Management Program. My time at NSRL was the best. I will miss working with everyone. ■

Sincerely,
Peter Goldsmith



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N S R L BULLETIN
National Soybean Research Laboratory Vol. 16, No. 1, Summer 2009

NSRL leads the way in research, outreach and education efforts involving soy. We explore the genetics of soybeans and engage in soybean production research that benefits producers. We educate society on the advantages of a soy enriched diet along with promoting the health benefits of eating soy. We engage in international development programs that find ways to overcome malnutrition through the use of soy.

The NSRL Bulletin is published by the National Soybean Research Laboratory at the University of Illinois, 170 National Soybean Research Center, 1101 W. Peabody Drive, Urbana, IL 61801; telephone (217) 244-1706; e-mail nsrl@illinois.edu; FAX (217) 244-1707. Bridget Owen, associate director; Melinda Anderson, editor; Joyce Seay-Knoblauch, photographer; Jerry Barrett, graphic designer.

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