Potato Progress

Research and Extension for Washington's Potato Industry
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Nutritional Factors Influencing Potato Consumption

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The Potato has many nutritionally desirable characteristics that are increasingly important to emphasize given some of the recent unwarranted negative nutritional press potato has received. The majority of nutritionists agree that potatoes are a very nutritious food, as does the USDA's food guide pyramid (http://www.nal.usda.gov/fnic/Fpyr/pyramid.html).

So, where is the bad press coming from? Some of it is from diets espousing a "carbohydrates are bad" message and targeting, not potato specifically, but carbohydrate rich foods in general. Even though this conflicts with traditional nutritional advice, the fallout affects potato. While the public may be used to hearing sugary foods (deserts, candy etc) critiqued, hearing carbohydrate rich foods such as potato, rice, pasta, and bread criticized is a more recent development. Thus, even if the public hears a majority doctors or nutritionists telling them to "eat their vegetables" and follow the food pyramid guidelines, they may still be confused and concerned that some people disagree.

Of the several popular diets promoting low carbohydrate intake, some are more restrictive than others. One of the most publicized diets, the Atkins diet, is very restrictive of carbohydrates in the early stages, but allows moderate carbohydrate consumption later, including potatoes. Most nutritionists frown upon such diets, pointing out vastly more scientific evidence supports the food guide pyramid recommendations, than what are often called "fad diets." Nevertheless, these diets have many enthusiastic and often vocal practitioners, and businesses have taken notice. Low carb items will be on the menu of 1650 Blimpie stores nationwide and McDonald's will offer low carb items in greater New York area starting in January 2004. These diets aren't restricted to the United States; in response to declining sales, the British Potato Council launched a "fab not fad" advertising campaign this year in potato loving Britain.

Also raising concerns about carbohydrates is increased awareness of the Glycemic Index (GI). The glycemic index, developed by scientists in 1981 to measure how certain foods affect blood sugar levels and to help manage diabetes, was not well known amongst the general public until its being touted in several popular diet books in the 1990s. The American Institute for Cancer Research criticized misuse of the GI (http://www.thedietchannel.com/faddiets.htm) by diet authors.

A change in the way carbohydrates are regarded by some nutritionists took place as a result of the GI data unexpectedly showing that some foods actually increased blood sugar levels faster than sugary snacks. Consequently, some nutritionists are quite critical of potato and other foods with high glycemic values. Lower GI numbers are considered better, whereas foods with scores above 70 are classified as high. Table 1 shows that if nutritional recommendations are based strictly on the GI then coke, table sugar, and ice cream all score better than potato. Findings like these recall the quote that "Someday they'll decide the real health foods are tobacco, steak, and beer." Amongst scientists, the glycemic index approach has both supporters and detractors, but there does not appear to be a consensus on whether or how to use it as

a dietary guideline for the general public. Criticisms of the method include the fact that glycemic values are typically measured after eating a single food alone, not after eating multiple foods at the same time (a typical meal) which can give different results, the small sample size of studies done to date and variability of results. For example, different studies have given values for carrots ranging from 16 to 92. Interestingly, the American Diabetes Association does not endorse glycemic indexing (Diabetes Care 2002;25:148-198) and instead suggests other dietary guidelines.

Table 1

Food (Source: University of Sydney GI Database)	**Glycemic Index**
Baked Potato (Russet Burbank)	78
Baked Potato (Russet Burbank)	111
Boiled White Potato	54
Boiled Potato (Desiree)	101
Coca Cola®	53
Vanilla Ice Cream	38
Table Sugar	60
Kidney Beans	23
Golden Delicious Apple	39

The Satiety Index, developed by Dr. Susanna Holt, ranks foods based on how well they satisfy hunger. Foods that make one feel full score better with the rationale being that the more full one feels, the less one eats. Boiled potatoes (323%) easily had the best score of all 38 foods tested including rice (138%), beef (176%) or cake (65%). This data contradicts one of the assumptions of the glycemic index—that any high glycemic food rapidly raises your blood sugar, causing insulin levels to rise which then lower one's blood sugar, making one hungrier and prone to eat more. That potato has the highest satiety score seems to be an unexplained discrepancy for it being a high glycemic food. In addition, a recent study (Nutr Rev. 2003 61:S88-94) suggests that high-glycemic carbohydrates consumed with protein actually promote exercise-induced muscle formation.

Also posing a problem for the theory that high carbohydrate diets cause obesity are studies of the Pima Indians. The Pimas in Arizona abandoned their traditional diet this century and adopted a Western diet with about 40% of their calories coming from fat. Obesity is at epidemic levels amongst these Pimas and over half of the adults have diabetes. However, Pima Indians in Northern Mexico are more physically active and eat a traditional diet that is carbohydrate rich, largely comprised of potatoes and tortillas (high glycemic foods), yet weigh on average 65 pounds less than their Arizona counterparts and have a far lower incidence of diabetes.

Claims that potatoes are 'empty calories' or lacking in vitamins compared to other vegetables are puzzling. Potato is a good source of essential amino acids and though it doesn't have large amounts, its protein is high quality approaching that of egg in value. It has more Vitamin C than apples or spinach (source: USDA national nutrient database), is high in potassium and has generous amounts of other vitamins, including B6. According to one study, potato was the second most important source of folate in the Dutch diet after bread. Potatoes are comprised of far more than starch and are capable of making very complex chemicals, many of which await characterization as potential phytonutrients.

As nutritious as it already is, the full potential of potato has not yet been tapped. For many nutrients and vitamins potato, researchers do not have a good idea of how wide a range exists amongst potato germplasm. A more thorough survey of potato lines may identify sources of even higher levels of key vitamins, leading to the development of new varieties very high in particular phytonutrients. Research

like this is particularly appropriate for potato because it is a dietary staple, consumed in higher amounts than most other vegetables. Marketers are increasingly interested in the economic advantage of branding, i.e. developing sufficient name recognition of a variety to the extent consumers seek it out (like Yukon Gold). Any potato variety exceptionally rich in vitamins or phytonutrients should be highly marketable. Research is underway in Prosser to identify potato lines that have higher than normal amounts of key vitamins and phytonutrients. Potatoes rich in antioxidants are a major focus and new lines high in antioxidants are being developed.

It is likely that the nutritional value of a given food will become increasingly important to consumers and influence their purchasing decisions. Potato should continue to strongly appeal in the years ahead to health conscious consumers who are aware of its many nutritional advantages.

WSU Horticulturist Interviews Scheduled

As many of you know, Dr. Robert Thornton, extension horticulturist and researcher on potatoes, is planning to retire as of January 2004. The University has been busy searching for a replacement for Dr. Thornton. The new scientist is expected to continue some of Dr. Thornton's important work on potato production and cultivar development, and develop innovative research and extension programs as well. The interviewees for this position are listed below, with the schedule for their interviews. All seminars in both Prosser and Pullman are open to the public, and interested industry members are encouraged to attend. The Prosser seminars will take place in the large conference room at the Prosser IAREC station. The Pullman seminars will take place in Johnson Hall, Room 191.

George Newberry - Tues. Dec. 2, Prosser Seminar at 11:00 am
Weds. Dec. 3, Pullman Seminar in Hort. Dept. at 2:30 pm

Pablo Morales-Payan - Mon. Dec. 15, Prosser Seminar at 11:00 am
Tues. Dec. 16, Pullman Seminar in Hort. Dept. at 10:00 am

Mark Pavek - Tues. Dec. 18, Prosser Seminar at 11:00 am
Weds. Dec. 19, Pullman Seminar in Hort. Dept. at 10:00 am

Upcoming Educational Events

- ✔ Hermiston Farm Fair & Trade Show Potato Seminar, December 3.
- ✔ Columbia Basin Potato Workshops
  - January 7, Moses Lake.
  - January 8, Pasco.
- ✔ Washington State Potato Conference and Trade Show, February 3-5, Moses Lake.
- ✔ Western Washington Potato Workshop, February 27, Mount Vernon.

WSPC Research Proposal Review Schedule

The WSPC goes through an exhaustive process each winter to review its research program and choose projects to fund for the coming year. There are two Research Reviews planned for the coming months, and any interested growers or industry partners are welcome to attend the meetings and listen to the proposed research for 2004. Meeting dates and locations are listed below.

December 17: Preliminary Research Review WSPC Office, Moses Lake, 8:00 am – noon.

This meeting reviews only new proposals, for research that has not been funded by the WSPC before. Each project will be afforded 15 minutes for presentation and questions. Researchers are encouraged to allow plenty of time for questions, and Research Council members are encouraged to ask all relevant questions no matter how pointed. The Research Council will meet after lunch to decide which proposals should be presented at the Final Research Review, and to suggest changes to the projects they heard in the morning.

February 12-13: Final Research Review Yakima – location to be determined

This meeting is a full 1½ days of reports of 2003 research and proposals for 2004 projects. WSDA recertification credits will be available. All projects are scored by the research council during the meeting, and funding recommendations will be made during the afternoon of the 13th.

Bacterial Ring Rot Seminar Planned for the Washington Potato Conference

Some recent problems with bacterial ring rot in Washington suggest that a refresher course might be helpful concerning the characteristics and prevention of bacterial ring rot in the potato crop. Hence, the organizers of the production-related sessions of the Moses Lake potato conference have scheduled a special workshop for the afternoon of Thursday, February 5th. The workshop will take place at the Big Bend Community College auditorium. The schedule for event is below.

Potato Ring Rot…An Industry Seminar, BBCC Administration Building Auditorium

1:30 PM	Potato Ring Rot…The Pathogen, Plant Symptoms and Disease Cycle, Dennis Johnson, Washington State University, Pullman, WA
1:55	Potato Ring Rot…Management Approaches Debra Inglis, Washington State University, Mt. Vernon, WA
2:20	The Seed Industry's Ring Rot Management Program Phil Nolte, University of Idaho, Idaho Falls, ID
2:45	Issues and Answers…Dealing With Ring Rot Panel Discussion
3:10	Adjourn