



Technology & Innovation

Yellow-fleshed potatoes high in beneficial lutein

By EduTransfer Design Associates Inc. & Haywire Creative

February 25, 2008

Photo by M.Konschuh, AAF



Research, initiated in 2004 and completed in 2007 by Alberta Agriculture and Food (AAF) scientist Dr. Michele Konschuh and colleagues Tricia McAllister and Darcy Driedger, is aimed at making a functional food claim for yellow-fleshed potato varieties as a way of promoting potatoes to consumers. Functional Foods are defined as foods that contain health-promoting compounds beyond calories, minerals and nutrients.

Yellow-fleshed potatoes contain a class of compounds, called carotenoids, which impart the yellow color in these potatoes. **Lutein** is a specific carotenoid compound, and has been associated with **a reduced incidence of age-related macular degeneration and cataract formation**.

"Our research was originally initiated to counter some of the negative publicity that starch and carbohydrate products like potatoes were receiving at the time from the low-carb diet plans. We wanted to show why potatoes are still a healthy choice," explains Konschuh.

To assess whether any of the registered or breeder potatoes would supply a good source of lutein, Konschuh first conducted trials in Alberta and looked at flesh color, total carotenoid content, and concentrations of lutein and zeaxanthin, another carotenoid compound. Twenty yellow-fleshed potato varieties were grown at the Crop Development Centre North (CDCN) at Edmonton and Crop Development Centre South (CDCS) at Brooks. Results confirmed that lutein:

- ▶ Is present in yellow-fleshed potatoes grown in Alberta,
- ▶ Content is maintained even after storage,
- ▶ Is not destroyed during the boiling or frying process.

Subsequently in 2005 and 2006, ten different yellow-fleshed varieties were grown to determine the quantity of lutein available in a serving of Alberta-grown yellow-fleshed potatoes, and whether location and harvest timing affected tuber flesh color intensity, total carotenoid content and lutein concentration.

Total carotenoid content in white-fleshed potato varieties ranges from 15 to 185 micrograms per 100 grams of fresh potato, while yellow-fleshed varieties can exceed 500 micrograms of lutein. A typical baked potato serving weighs approximately 170 grams. The research found that an average size yellow-fleshed potato at 170 grams could contribute up to **100 micrograms of lutein**, depending on the variety. The research found that lutein content was mostly influenced by genetics, with some varieties containing higher levels than others.

"We're not saying eat yellow potatoes instead of vegetables. They won't knock spinach off the menu," explains Konschuh. "But yellow potatoes have a high enough lutein content to allow a functional food statement on the bag, and they are much higher in lutein content than pasta and rice. That's where potato growers could have a marketing advantage."

Lutein Information Centre (US)
www.luteininfo.com

Lutein Content of Yellow Fleshed Potatoes Grown in Alberta 2004 report:
[http://www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/opp1:\\$FILE/lutein_2004.pdf](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/opp1:$FILE/lutein_2004.pdf)

Final Report
[http://www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/opp1:\\$FILE/luteinfinal.pdf](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/opp1:$FILE/luteinfinal.pdf)

Michele Konschuh
 Potato Research Scientist
 Crop Diversification Centre South
 301 Horticultural Station Road East
 Brooks, AB T1R 1E6
 403-362-1314 (phone)
 403-362-1306 (fax)
michele.konschuh@gov.ab.ca

To put the lutein content in perspective, Korschuh says that studies at the University of Florida found 2.4 milligrams (Mg) per day (1000 micrograms equals 1 milligram) of lutein showed a beneficial increase in serum lutein concentration and an increase in macular pigment density. Vegetables are a good source of lutein:

- ▶ Lutein is present in many leafy green vegetables and is included in vitamin pills for mature consumers at rates of 225 to 600 micrograms.
- ▶ One cup of cooked spinach, for example, contains 20.4 Mg of lutein.
- ▶ According to the Lutein Information Bureau, the average American consumes only 1 to 2 Mg of lutein per day, considerably less than the 4 to 8 Mg consumed if the USDA Dietary Guidelines are followed.

The criteria for making a food claim is that the lutein content has to be above a certain level, and the content is reproducible and dependable. The AAF research was able to confirm these requirements. The food claim is separate from the nutritional facts section on food labels.

Whether potato companies will actually make the lutein claim remains to be seen. Currently, most potato varieties are white-fleshed, and grown for the french fry and processing industries. Yellow potatoes have a very small niche as table potatoes, although a company that specializes in small, yellow potatoes, [The Little Potato Company](#), reports that their market is growing at a rate of 12 percent per year. And while yellow-fleshed potatoes may not be the richest source of lutein, the fact that potatoes contain another health promoting compound may encourage potato consumption among health conscious consumers and retailers, or provide good reasons to continue including potatoes in a balanced diet.

Copyright 2012 Canadian Farm Business Management Council
www.farmcentre.com