Flax Council of Canada

flaxfocus

Flax and heart disease treatment: A match made in heaven?

Will flax benefit patients with heart disease? That's the question which is the focus of groundbreaking research being undertaken by Dr. Grant Pierce and his team at the St. Boniface Hospital Research Centre in Winnipeg. The answer could be good news for patients, physicians, producers and food manufacturers alike.

This two-year clinical trial on flax is the first of its kind in the world. The study will monitor the effects of three tablespoons of ground flax, eaten daily by 250 volunteer patients with a potentially fatal heart problem called peripheral arterial disease (PAD), which affects one in five people over 70 years of age.

These patients are prone to painful blockages in the arteries to their legs and other extremities that can make walking extremely difficult. Many of them also experience arrhythmias or abnormal heart beats, which can lead to heart attacks, strokes or death. Both of these conditions have been shown to respond well to a daily dose of ground flax in Dr. Pierce's previous research on animals. The researchers hope to show that adding flaxseed to patients' diets will help to reduce their symptoms.

If the study shows that ground flax is beneficial to patients with PAD, the sky is the limit, according to Dr. Pierce. Research could be done on different groups of people with heart disease and other products. With 80 per cent of flax in the world grown in wester Canada, Dr. Pierce said "It's a match made in heaven for the agricultural community, as well as for us!"

Alex Austria in St. Boniface Hospital Research Centre lab peering down a microscope with Melanie Richard a technician in the lab and Dr. Grant Pierce looking on.

These researchers have already confirmed that flax is a compound that can act against heart disease in the lab. However, as Dr. Pierce explained, "It's a big step to go from our past research to clinical trials on people who already suffer from heart disease."

Participants in the study will choose from a menu of 15 locally-made items such as muffins, buns, bagels, bars and pasta each month. Their selection will be delivered to their door, then stored in their freezers.

The local agri-food industry was approached to make a variety of products with therapeutic doses of ground flax. "We've been fortunate to work with the Canadian

(Continued on Page 2)

International Grain Institute, the Food Development Centre in Portage la Prairie and Canada Bread which have been very helpful by creating a great number of products," said Dr. Pierce. Flax for the study will be donated by Manitoba-based Pizzeys' Nutritionals.

Half the participants will receive products containing ground flax; half will receive "placebo" products without flax. The pleasant nutty flavour of ground flax may be easier to swallow than similar quantities of fish in a diet which have been shown to reduce the severity of heart disease in both animal and human trials. Flax may also have different, perhaps more potent, benefits than fish oil.

Individuals taking part in Dr. Pierce's study won't know whether they are in the group which is receiving flax-filled products or not.

However, all of them will be monitored every six months through tests to measure primary endpoints – heart attacks and strokes and the need for further surgical interventions. Researchers will also look at risk factors including the rate of arrhythmias, blood levels of fats like cholesterol and alpha-linolenic fatty acid (ALA), the omega-3 contained in flax seeds, as well as blood pressure and exercise performance. The addition of flax to their diet could improve both their longevity and quality of life.

Research steps so far:

- First, researchers found that animals with heart complications (mimicking what happens to humans) that were fed a flax-supplemented diet didn't experience an irregular heartbeat. In fact, the flax seemed to protect them against the worst type of arrhythmia, known as ventricular fibrillation in which the electrical properties of the heart completely lose their natural rhythm.

- Next, they studied the effect that flax has on cholesterol-filled blockages (atherosclerosis), which allow less blood to go through the arteries and causes the irregular heartbeat, heart attacks and other heart disease. They found flax has a significant anti-atherogenic effect, that is the ability to stop these blockages in the arteries.

- The next step was to identify a population of patients who have the characteristics that flax could ameliorate. Several questions, some of them asked by the public, served to guide Dr. Pierce's research. Will patients' gastro-intestinal tracts be able to handle therapeutic amounts of flax? Will they experience gas, bloating or diarrhea? What type of flax should they be taking? Industry was also curious because products were more "shelf-stable" depending on whether flax oil, flax seeds or ground flax was put in their products.

- In a project involving 18-29 year olds with no heart disease, Dr. Pierce found that eating whole flax seeds did not result in the absorption of ALA. However, ground flax resulted in significant amounts of alpha-linolenic fatty acid (ALA) being absorbed and even more with flax oil. Problems with gas and bloating occurred with the whole flax seeds in the quantities eaten. There were some problems with the oil but no problems with the ground flax.

- In another study, they found that ALA absorption was almost as good in older adults, 45-69 years of age, and no problems with bloating or gas occurred. They then tested the dosage of flax ingested along with the rate of ALA absorption and found the daily dose of 30 grams is optimum. ■

This major study is an exciting culmination of research during the last 10 years that Dr. Pierce and others have done into the effects of flax on animals.

The research is taking place in Winnipeg through a unique combination of facilities. The state-of-the-art Canadian Centre for Agrifood Research and Health and Medicine (CCARM) looks at the mechanisms of functional foods such as flax and other natural health products and their ability to fight disease. From there, the research moves on to clinical trials in the Asper Clinical Research Institute which is associated with the St. Boniface Hospital, a teaching hospital of the University of Manitoba. Agriculture and Agri-Food Canada (AAFC) and the University of Manitoba are important partners with St Boniface General Hospital in this research and in CCARM.

"That kind of partnership of agriculture, hospital and university doesn't occur anywhere else in the world," said Dr. Pierce. "So we have a huge opportunity to now move from the lab bench to the bedside to help patients."

Dr. Pierce's research has received the support of a large number of companies and foundations. He expressed his appreciation to the Flax Council of Canada and Flax Canada 2015, which with the support of AAF "have been drivers behind the research by providing funding and helping to make the research a reality". The Agri-food Research and Development Initiative (ARDI) also provided critical support to ensure this project would be successful.

Patients in Manitoba will be the first to benefit from the research. Local companies will also benefit from producing and marketing flax which will lead to an increase in demand. "I think the gold in flax is preventative" he said. "I'm hoping to get enough data from these studies to persuade more people to increase levels of flax in their diet naturally. ■

The flax crop is blooming now in western Canada, colouring the Prairie landscape with wide bands of delicate blue flowers! Based on Statistics Canada planting forecasts, Canadian flax production could reach 750,000 tonnes in the 2008/09 growing season.

FOCAL POINTS

When ‘fresh’ means bread

To anyone who grew up in a home where the bread was home-made, the smell of bread baking is irresistible.

Bakers are discovering that fresh-baked bread made with quality ingredients is a treat that more and more people are glad to pay for, says Deborah Cassell, writing in Snack Food &Wholesale Bakery magazine (2007 Nov). Often called “artisan” bread, fresh-baked bread is seen as a small luxury item people will buy.

Unwrapped and unlabelled, the shiny crust of an artisan loaf suggests home-made taste and superior quality to many. People are paying extra for unsliced and unwrapped bread, sold in rolls, round or long shapes. Italian, ciabatta and whole grain are a few of the popular artisan breads that are rolling out of specialty bakeries, in-store bakeries, and onto customers’ tables in restaurants.

Alongside the popularity of such breads, comes the use of flax by bakers. Flax has long been used by bakers of artisan loaves. As whole seed, flax adds texture to the crust. When milled and included in the bread dough, flax also adds nutrition.

Many U.S. bakeries, including Natural Ovens (WI); French Meadow Bakery (ILL); and Butterkrust Bakery (FL), have incorporated flax in bakery food formulations. Natural Ovens’ Health Max bread contains ground flax, which contributes 500 mgs of omega-3 fatty acids per slice, according to Tom Payne Marketing’s 2005 U.S. Market for Flax Ingredients report.

Why now

The love affair with artisan breads is sparked by several developments in the food industry. A noticeable interest in high quality food has been developed through television programs led by celebrity chefs who promote local and fresh ingredients.

Another motivator has been people’s greater understanding of the benefits of whole grains in the diet.

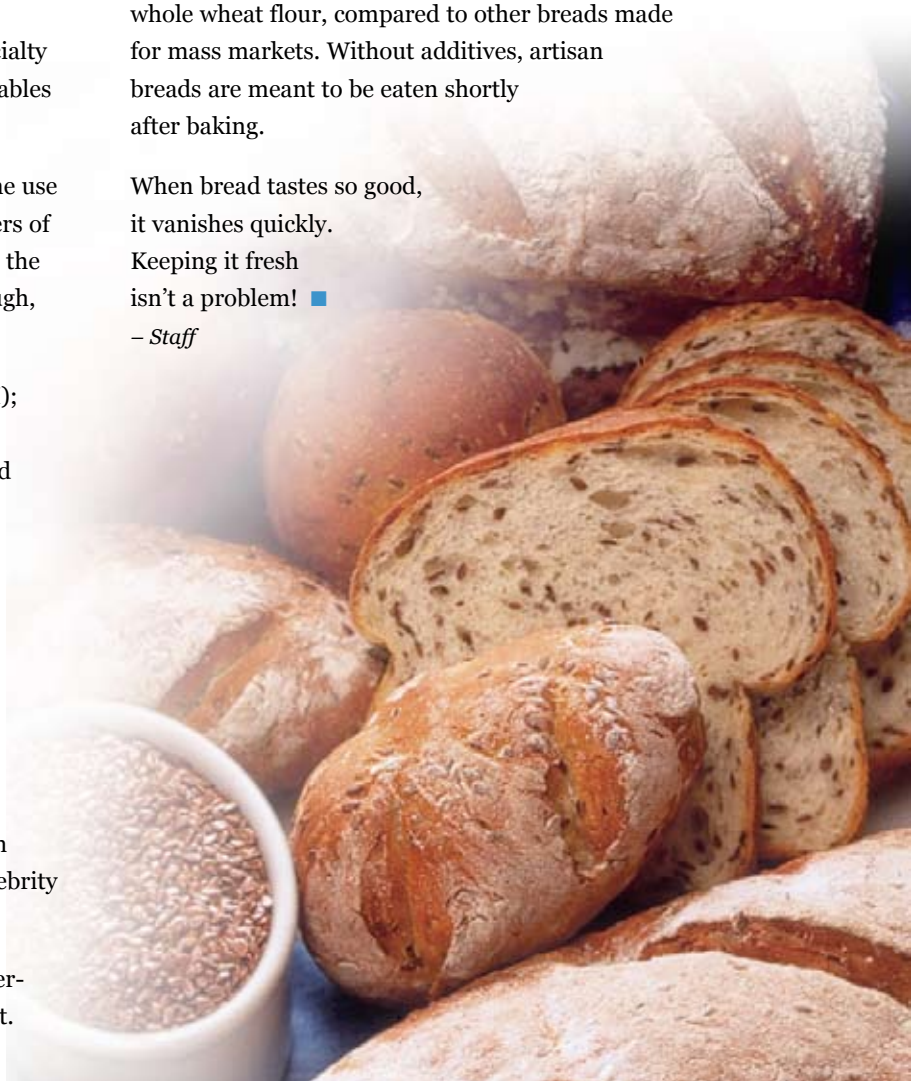
When fast-food chains, such as Wendy’s, offer whole grain bread products in standard sandwich fare, people latch onto the idea that there are health benefits in whole grains. Today’s trend towards less processing in foods also favours specialty breads.

To fully serve the appetite for specialty breads, some bakeries are delivering breads in dough form, ready to be baked in store and restaurant premises. This new trend is providing another market for bakeries.

People don’t even mind if the artisan bread goes stale quicker than its sliced and packaged relatives. Artisan breads typically contain a limited number of ingredients, such as water, yeast and whole wheat flour, compared to other breads made for mass markets. Without additives, artisan breads are meant to be eaten shortly after baking.

When bread tastes so good, it vanishes quickly. Keeping it fresh isn’t a problem! ■

– Staff



Flax groups exhibit at the Institute of Food Technology show

Three flax organizations came together to bring information about flax in food formulations to U. S. food chemists and manufacturers at the Institute of Food Technology (IFT) Expo, June 28 to July 1, 2008 in New Orleans, LA.

The Flax Council of Canada, Saskatchewan Flax Development Commission and Ameriflax shared a booth at the show

l., Kelley Fitzpatrick, Director of Health and Nutrition, Flax Canada 2015 and r., Kaye Effertz of Ameriflax

Pizzeys Nutritionals also exhibited its flax products at the show

Kaye Effertz at the booth talks with a client

Flax can lower the glycemic index of foods

By Kelley Fitzpatrick

On February 28, 2008 the Webinar "Flax, Fibre and the Glycemic Index", attracted a record 950 registrants! Hosted by FC2015 , through the global media company Prepared Foods, this event was the third successful one of its type. After the event, people are still viewing the presentations (You can too at Prepared Foods: www.preparedfoods.com).

What is the Glycemic Index?

It has been more than 25 years since Dr. David Jenkins of the University of Toronto first proposed the concept of the glycemic index (GI).

Upon digestion, carbohydrates produce glucose, which is rapidly absorbed within the body. The GI is a ranking of the carbohydrates (for the most part) in a food, on a scale from 0 to 100, according to the extent to which they raise blood sugar levels after having been eaten. For example, pearl barley has a GI of 33, oranges 49, and whole wheat bread 71. Foods with a high GI are those which are rapidly digested and absorbed and result in marked increases in blood sugar levels. Low-GI foods, by virtue of their being slowly digested and absorbed, produce gradual rises in blood sugar, and have proven benefits to health. GI values are classified as follows:

GI VALUE	CLASSIFICATION
70+	High
56-69	Medium
0-55	Low

There are many factors that will affect the GI of a food. These include the degree of starch gelatinization, ratio of amylose to amylopectin, the degree of retrogradation, the degree of processing, particle size, chemical structure, fiber content, cooking methods, and the amount of fat, protein, and acid in the food being tested. All of these factors will influence the rate of digestion of the food, thus affecting its GI value.

Why the interest in the GI?

The nutritional value of carbohydrates has become a major issue within the food industry. Consumers are now actively selecting specific types of carbohydrates for exclusion or inclusion in their diets and are no longer considering carbohydrates just as a source of calories.

Consumers have learned that blood sugar (glucose) levels are important because they affect their risk of developing diabetes or cardiovascular disease, weight gain, as well as mood and concentration. Numerous stories in magazines and newspapers have contributed to consumers' understanding of blood sugar levels.

Almost one in four American shoppers has decreased the consumption of high-glycemic carbohydrates, and one in three has decreased the consumption of carbohydrates overall, according to the 2005 HealthFocus Trend Report. The same survey found that 66% shoppers agree that "Maintaining healthy blood sugars levels is important".

The 2005 Natural Marketing Institute's "Health & Wellness Consumer Trends Survey" found that 45% of Americans had used low GI foods in the past

year and similar consumer research conducted in 2007 by Washington based International Food Information Council (IFIC) reported that 46% consumers "have heard of the GI" compared to 32% in 2005. With this type of consumer awareness, the demand for low- or reduced-glycemic foods is expected to significantly expand over the next several years, presenting significant opportunities for new product development and for agricultural products.

What are the benefits of a low GI?

Recent studies from Harvard School of Public Health indicate that the risks of diseases such as type 2 diabetes and coronary heart disease are strongly related to the GI of the overall diet. In 1999, the World Health Organization (WHO) and Food and Agriculture Organization (FAO) recommended that people in industrialized countries base their diets on low-GI foods in order to help prevent the most common diseases of affluence, such as coronary heart disease, diabetes and obesity.

The GI has long term health implications. Low-GI diets are associated with, among others, a decreased risk of diabetes; reductions in diabetes complications; and decreased risk of cardiovascular disease, colon cancer, breast cancer, and endometrial cancer.

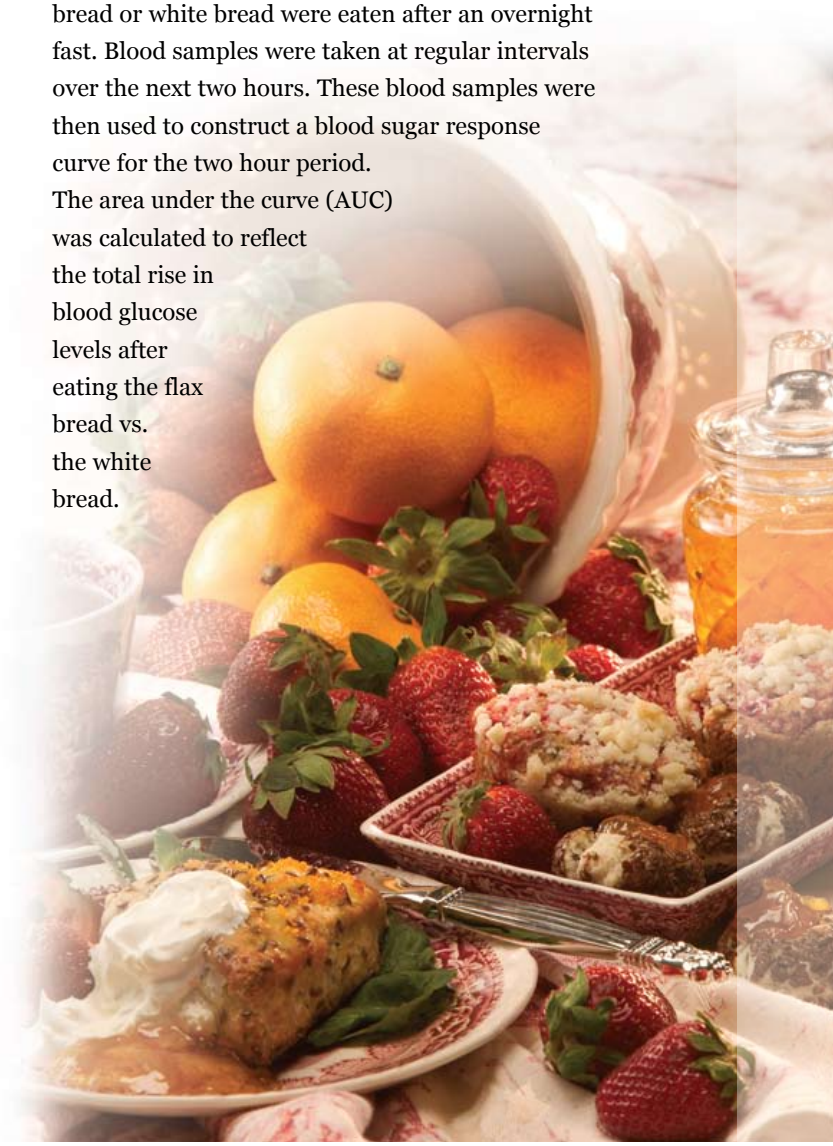
A recent meta-analysis adds more support to the growing science for the GI with its conclusion that low-GI diets are independently associated with a reduced risk of a number of chronic diseases including diabetes and heart disease. The study results showed that the protection was comparable with that seen for whole grain and high fibre intakes. The findings support the hypothesis that consistent high GI is a universal mechanism for disease progression. The study involved a systematic review of 37 published prospective cohort studies of GI and relationship with the risk of a number of chronic diseases.

Foods with differing GI values may affect satiety and appetite regulation differently. There is some evidence suggesting that low GI foods increase satiety, thereby reducing subsequent food intake. This suggests that the GI may also play a role in weight loss and help control the rising epidemic of obesity.

Can flax affect the GI?

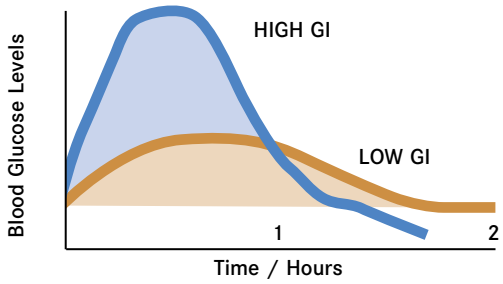
Prior to 2004, studies indicated that the addition of flax to a product reduced the GI of the food. FC2015 was interested in expanding this work and so was the flax industry. Thus, in 2005 FC2015 organized a consortium of four flax companies with the aim being to assess eight of their flax based products for potential to lower GI. The study was organized under the supervision of Dr. Alexandra Jenkins, Vice-President of the Glycemic Index Laboratories (www.gilabs.com) at the University of Toronto, and determined the GI of breads containing different amounts of flax in milled form.

The flax bread was compared with a white bread. Subjects consumed the test breads under standard defined GI protocols. Measured portions of the flax bread or white bread were eaten after an overnight fast. Blood samples were taken at regular intervals over the next two hours. These blood samples were then used to construct a blood sugar response curve for the two hour period. The area under the curve (AUC) was calculated to reflect the total rise in blood glucose levels after eating the flax bread vs. the white bread.



The GI rating (%) was calculated by dividing the AUC for the flax bread (low GI food) by the AUC for the reference food (high GI food in the figure below) and multiplying by 100 (see Figure 1). The use of a standard food, in this case the white bread, is important for reducing subject variability.

Figure 1: Measuring the GI



The amount of carbohydrate in the reference and test food must be the same.

Following the complete analysis of the results, Dr. Jenkins reported that the GI values of all the flax breads were significantly lower than the GI of the white bread and were in the low to medium ranges.

What is the market for GI foods?

The consumption of low-GI foods represents a significant market opportunity for flax-based foods and, as this article has shown, an area where the flax industry can contribute to global health issues. In early 2007, the market research firm Packaged Facts reported that sales of low-glycemic foods and beverages reached $350 million in 2006 , and predict that sales will keep increasing at a compound annual growth rate of over 45 percent from 2007 to 2011, with sales projected to reach $1.8 billion in 2011. "The current adult- and childhood-obesity epidemic, coupled with the increase in the prevalence of diabetes and other diet-related ailments such as heart disease, are key driving forces in the labeling of glycemic and glucose on product labels," the report states.

In a Wall Street Journal article, it was reported that the growth in total food and beverage sales in 2005 increased by 3%. Low fat, reduced fat and fat-free foods increased in sales by just over 2%, low carbohydrate food sales declined by over 10%, and low glycemic foods grew 412%.

Conclusion

Interest in low-GI foods represents a significant market opportunity for Canadian flax. Adding flax to breads is one area where significant lowering of the GI was achieved. Knowing the GI of foods, and targeting those with a low index can help people make healthier eating choices. ■

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Flax Power Ltd. – Adding value through "burning" flax shive!

by Les Rankin

When a flax processor, such as Schweitzer-Mauduit Canada Inc., processes flax straw left following harvest, upwards of 50% to as much as 70% of waste material may be generated. Numerous applications have been studied for this waste (called "shives") in order to generate extra value. One such enterprise, Flax Power Ltd., appears to have developed a solution – dense fire logs manufactured from flax shive.

Flax Power Ltd. has built a unique extruder that compacts flax shive into environmentally friendly 100% natural clean burning fire logs trademarked under the name "Power Logs." These logs burn longer than hardwood and hotter and cleaner than lignite coal, generating 80% less particulate and 66% less creosote. These logs are green-house gas neutral therefore do not contribute to the ever growing green house gas problem. Kevin Lumb, Flax Power Owner and President explained that "One year's anticipated production of Power Logs could reduce greenhouse gasses by 7000 tones when compared to generating the similar value of BTU's with natural gas."

What is unique about flax straw?

Flax Power is taking advantage of the unique features of flax straw. The cellular structure of flax straw is comprised of natural lignins (not to be confused with the "lignans" found in the hulls of the seed that have human health benefits – another but separate advantage of flax) that have "gummy" characteristics. Thus no added glues, waxes, resins or binding agents are required to comprise the shives into a log. Flax Power has designed special equipment that uses conditions of extreme heat and pressure to essentially "glue" the log together.

The resulting flax fire log burns with no popping or spitting of embers leaving a very fine ash that does not clinker. It is very clean to handle and does not provide residual material for insects. Additionally, the log ash is alkaline and makes an excellent fertilizer for gardens and flowerbeds.

Flax Canada 2015 Inc. is proud to be a supporter of Flax Power. The Manitoba and Canadian governments through the ARDI program have also invested in the development of the technology. Flax logs show potential to provide added value to residual straw as the by product of the flax crop. What is more, the logs could be considered in the long-term as a renewable energy source, are a carbon neutral fuel and contribute no greenhouse gasses. The company currently operates out of a facility near Brandon Manitoba but plans to open a commercial plant late summer 2008, near its source of flax shive in Carman. ■

For more information, please contact John Oliver, Chair, Flax Canada 2015 Inc. at (905) 706-1405; Les Rankin, Co-ordinator, and Director, Industrial and Fibre Uses; Kelley Fitzpatrick, Director, Health and Nutrition at the Flax Canada 2015 Inc. office at (204) 982-2115, or email: fc2015@fc2015.ca

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