Flax Council of Canada

flaxfocus

French company seeks Canadian flax for its flax-enriched animal feed

In March of this year, the Flax Council of Canada and members of the Canadian flax industry hosted representatives of the French company VALOREX®, an animal feed production company. The executives were in Winnipeg to investigate the purchasing of up to 20, 000 tonnes of Canadian flax for use in extruded animal feed.

Valorex produces an extruded feed with flax as an ingredient that is fed to dairy cattle, beef, hogs and poultry, for the production of omega-3-enriched foods. These enriched foods are produced and marketed exclusively through partnership with a 100-member association called Association Bleu-Blanc-Coeur (BBC). BBC members' animals are fed Valorex brand feeds and the resulting foods are sold under the Bleu-Blanc-Coeur label, and another logo, Tradi-Lin.

"Success in the EU marketplace with these omega-3-enriched foods led to the need for additional flax supplies," said Barry Hall, President of the Flax Council of Canada. He says BBC food products contain naturally enhanced levels of omega-3s and in blind-taste tests, consumers prefer them to non-enriched foods. With its emphasis on the whole diet approach, in France, Valorex has received approval to market its omega-3 products as "naturally increased in omega-3".

Mr. Hall visited Valorex facilities on a flax trade mission to the European Union in 2007. He says the technology is being used in France, Switzerland, Portugal, and was being introduced in Italy, Belgium, and Malta, as well as in Israel.

Some discussions on the introduction of the feed and enriched foods to Canada, through the JEFO Nutrition Inc. of Quebec, have taken place. ■

(Clockwise from upper left)

In France, flax seed features prominently in the production of omega-3-enriched foods, such as meats that are sold mainly under the Bleu-Blanc-Coeur (BBC) label.

Eric Fridfinnson (left) , Chair of the Flax Council of Canada, and Kelley Fitzpatrick (right), Director of Human Health for Flax Canada 2015 Inc.

The BBC label assures customers of omega-3 enrichment.

Flax oil poised to start market revolution

Canada is poised on the edge of a dietary revolution, according to William (Bill) Vincent, Shape Foods, Brandon, president, who says the level of omega-3 in the North American diet has been on a downward slope for more than 100 years.

Shape Foods now has flax-oil based products with mass market appeal that can start reversing major health issues associated with this decline.

Flax oil can directly address the lack of omega-3 in the human food supply, Mr. Vincent told a Manitoba Ag Days audience in the Keystone Centre, Brandon, Manitoba on January 16, 2008. Other speakers at the flax table discussion were John Oliver, Flax Canada 2015 chair and Eric Fridfinnson, Flax Council of Canada chair.

"Flax represents the backbone of the potential to be able to solve the lack of omega-3 in the food supply," Bill Vincent said.

When Mr. Vincent started Omega Nutrition in 1987, it was the first company in North America to produce edible flax oil. Today, he says flax oil and flax seed products have started to jump from the health food niche market to the mass market. Shape Foods flax oil products, including flax oil and flax/olive oil blends, will hit store aisles across North America this spring.

Flax now is proven as the richest plant source of the omega-3 fatty acid, alpha-linolenic acid (ALA). It's also proven that oil content is latitude-dependant. Omega-3 content ranges from 45 to 66 per cent, depending on latitude and variety. As the growing latitude moves north, oil content increases. Production is sensitive to day length and night temperatures as the seed ripens.

Alpha-linolenic acid (ALA) omega-3 also is one of the two essential fatty acids; the other is linoleic acid (LA) omega-6.

"Your body cannot make them; you have to find them in food. Given this, your body can make all the other fatty acids it needs, but if either of these is missing, you can't make it," he said.

Railway development in the late 1800s led to centralized agriculture and food processing, which led to a declining natural supply of omega-3. Food oils were hydrogenated to extend shelf life, and the nutritional value was stripped.

ALA omega-3 used to be found in beef, pork and poultry. It came from chlorophyl in natural plants livestock ate, until they were confined and given controlled diets.

It took about 40 years for the shift in diet to develop into health problems. Now, science is showing that the "natural balance" of omega-3 with the other

William Vincent, president of Shape Foods in Brandon, Manitoba spoke about flax nutrition at a Flax Council of Canada presentation in Brandon, Manitoba in January.

essential fatty acid, omega-6, could have been approximately 1 to 1 before modern farming and processing was practiced. Depending on the diet and other things, a healthy ratio should range from 3:1 in favour of omega-3 to 5:1 in favour of omega-6.

"The ratio of omega-3 to omega-6 in today's North American diet may be as much as 27 to 1 in favour of omega-6," Mr. Vincent said.

That has a direct effect on the arterial and heart system. Doctors now understand, Vincent said, that lack of omega-3 in developing children is one reason for increasing issues such as learning disabilities and attention deficit disorder. "They discovered that shortfalls of architecture happening in the brain were additive from generation to generation. So there were five generations now with lack of omega-3 in the food supply for developing infants, and that was causing the brain not to be well-formulated."

A second critical function is that omega-3 causes blood platelets to become less sticky; it assists in reducing tissue inflammation. Inflammation is the major cause of problems associated with the most common killer diseases. Omega-6, however, has the opposite effect. It causes blood to become more sticky and increases tissue inflammation.

The remedy to these issues is to replace omega-3 in the food supply. Fish oil has a role to play, but it can't alone solve the issue of imbalance, he said.

"The imbalance of omega-3 and omega-6 is where flax can play a leading role. The richest plant source of omega-3 anywhere is flax," he concluded. ■

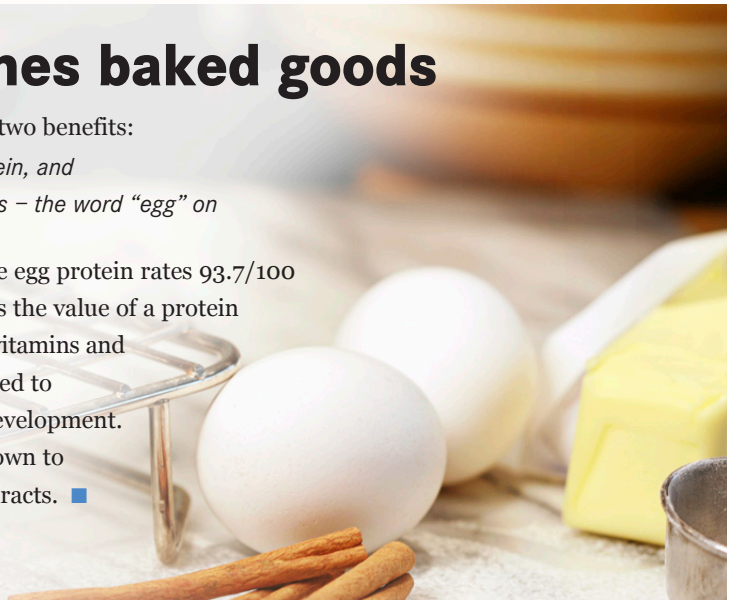
Egg protein enriches baked goods

Using eggs in baked goods provides at least two benefits:

1. *Eggs add nutrition in the form of protein, and*
2. *Eggs make labelling simpler for bakers – the word "egg" on an ingredient list keeps the list short.*

Eggs are a very high source of protein: whole egg protein rates 93.7/100 compared to beef protein at 74.3/100 (100 is the value of a protein to human nutrition). Egg yolks also provide vitamins and minerals, including choline, a B vitamin linked to reducing memory loss and to infant brain development. Eggs also provide lutein, which has been shown to prevent disorders of aging eyes, such as cataracts. ■

Source: the skinny on eggs. Maple Shade (NJ): Baking Management, 2007 Sept. p 48.



Terms explained

Confused about terms of heart disease? Two terms are often used: Cardiovascular disease (CVD) and Coronary heart disease (CHD). CVD is the umbrella term and usually refers to diseases associated with atherosclerosis. CVD includes diseases of the heart (coronary heart disease or CHD) and circulatory system. CHD can include arrhythmia, angina, myocardial infarction, cardiomyopathy, myocarditis, and valve diseases. Other conditions related to CVD include cerebrovascular disease (stroke), peripheral artery disease (PAD), and venous thromboembolism. ■

– Dr. Diane Morris

Your QUESTIONS answered

QUESTION: Is there any link between consuming flax, which is high in ALA and prostate cancer?

Dear reader,

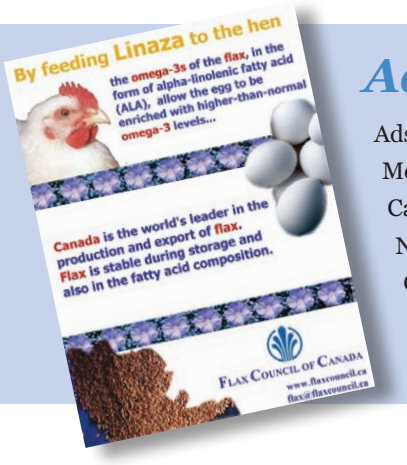
Flax is rich in alpha-linolenic acid or ALA, for short. ALA is the essential omega-3 fat found in flax, soybeans, walnuts and other nuts, some vegetable oils and some meats. Flax oil contains more ALA per tablespoon than milled and whole flax seeds do. This is the basis for the concern that men at risk of prostate cancer should avoid eating flax oil. The question about a possible link between dietary ALA and prostate cancer is one of those areas where we simply do not have a firm answer. Here are a few issues to think about on the topic of ALA and prostate cancer risk:

1. *No one knows how ALA might contribute to prostate cancer, if indeed it does, and why ALA would behave differently in prostate tissue than it does in breast tissue. That is, diets rich in ALA have been shown to protect against breast cancer. Studies in animals show that ALA interferes with cancer processes – feeding ALA-rich flax oil to rats or mice has been shown to decrease the number and size of mammary (breast) tumours and increase survival time.[1] Indeed, a study published by Dr. Lilian Thompson at the University of Toronto reported that ALA-rich flax oil had the greatest protective effect against metastasis of breast cancer cells in mice.[2] So, there is good evidence ALA protects against mammary tumour growth in animal studies. The confusion comes from the fact that both prostate tissue and breast tissue are hormone-sensitive cancers and, thus, would be expected to react to the actions of hormones and fats like ALA in similar ways. It is not clear why ALA would be pro-cancer in prostate tissue but anti-cancer in breast tissue.*
2. *Animal and human studies suggest that dietary flax favourably affects cancer processes in the prostate gland. Dr. Wendy Demark-Wahnefried at Duke University Medical Center reported that mice fed milled flax had less aggressive prostate tumours than mice fed a standard laboratory diet.[3] In two pilot studies among men with benign prostate neoplasia or prostate cancer, Demark-Wahnefried found that men who consumed milled flax (30 g or about 4 tbsp per day) showed beneficial changes in prostate cell biology, including decreased cell proliferation rates.[4,5]*
3. *Flax oil and milled flax are not the only sources of ALA in our diets. The main sources of ALA are margarines, mayonnaise and salad dressings made with soybean oil, and also meats like beef and pork.[6] Focusing on flax oil as a source of ALA does not take into account these other foods eaten by most men in North America.*

We simply do not have enough information to determine how dietary fatty acids affect cancer processes in tissues. Test tube studies are not reliable. Large population studies (epidemiologic studies) vary widely, with some suggesting that diets high in ALA are associated with prostate cancer and others finding no association. In the strongest studies, the ones where the ALA content of prostate tissue was measured, one Danish study found a positive relationship while two US studies found no relation between the ALA content of prostate tissue and prostate cancer.[1] Truly, the epidemiologic research is a mess at the moment.

But consider this: Western-style diets rich in processed meat, fried fish, chips and white bread are linked with an increased prostate cancer risk.[7] Vegetarian men have a low risk of prostate cancer.[8] That is a finding that is hard to explain if you believe that ALA may increase prostate cancer risk. ■

References: **1**. Morris DH. 2007. Flax–A Health and Nutrition Primer. Winnipeg, MB: Flax Council of Canada. **2**. Wang L, et al. 2005. Int J Cancer 116: 793-798. **3**. Lin X, et al. 2002. Urology 60: 919-924. **4**. Demark-Wahnefried W, et al. 2001. Urology 58: 47-52. **5**. Demark-Wahnfried W, et al. 2004. Urology 63: 900-904. **6**. Kris-Etherton PM, et al. 2000. Am J Clin Nutr. 71: 179S-188S. **7**. Ambrosini GL, et al. 2008 (Feb 7). Ann Epidemiol. [Epub ahead of print]. **8**. McCann MJ, et al. 2005. Nutr Cancer 52: 1-14.



Advertising in Mexico

Ads such as this one will promote flax health and flax use in omega-3 eggs in Mexican trade magazines this year. The ads will appear in Spanish. Trade between Canada and Mexico has increased significantly since the implementation of the North American Free Trade Agreement (NAFTA) between the United States, Canada and Mexico in 1994. Mexico has become Canada's fourth largest agriculture and agri-food export market.* ■

*Agriculture and Agri-Food Canada, 2006

FOCAL POINTS

Aging Baby Boomers will influence future food trends

The large population of Baby Boomers, which is now aging, will continue to influence the food industry in its development and marketing of foods, according to food trend analysts. The Baby Boomer generation has reached the affluent 45 – 64 year old age bracket, and its food preferences will shape food development, marketing, and restaurant fare. Here are some trends analysts predict:

- *Since people's senses of taste and smell tend to deteriorate as they age, foods fortified with strong or even bitter tasting ingredients such as strong lemon – flavours which might have rejected at an earlier age — will become more prevalent in foods.*
- *Flavour tweaking can also occur with ethnic foods and sweets.*
- *With aging, a preference for childhood treats may resurface.*

Older couples may typically dwell in a smaller household than those of families with children still living at home. With a smaller number of diners, mealtimes may become more of a social event, impacting restaurant fare and service. This will influence some other trends:

- *While searching for a dining experience rather than just a meal, this group will demand varied restaurant menus and an interesting restaurant ambience.*
- *At the same time, the focus on food quality and nutrition may increase as this group manages what can be chronic conditions associated with aging; conditions such as diabetes and heart disease have strong links to diet, again affecting food choice and meal choices.*
- *While quality remains important, convenience will also be a factor for meals prepared at home.*
- *As boomers opt for simple and healthful foods, being able to trace food from its source to their kitchens will become more important. For example, Dole invites consumers to access to its website where, by entering a product code, they can find the actual farm where the product was harvested.*
- *Finally, food spoilage concerns will influence food packaging. Some Boomers may maintain more than one residence, in different locations across the continent or in the world, requiring them to buy foods with longer shelf life and less chance of spoilage.* ■

Source: Dziuk A. Banking on Boomers. Bensenville (IL): BNP Media; 2007 Dec. pp 21-29.

Flax and carbon credits don't mix

Cashing in on 'carbon credits' on no-till land is quickly becoming an option on the Prairies, but it may not be available for a while for flax growers.

For other crops, the only place to get a payment right now in Saskatchewan and Manitoba is through the Chicago Climate Exchange (CCX). Two western Canadian companies are registered on the CCX and are signing up all the no-till and reduced till acres they can. The companies are C-Green Aggregators of Regina and Flatlander Environmental Services, Edmonton. Contracts offered by the companies are similar in that they must conform to a project guideline set out by the CCX.

Contracts commit the farm to offering all the credits that it can accumulate between 2006 and 2010 to the CCX through the aggregator. Credits for the year are eligible for sale in early winter, after a verification process. A 20% holdback is mandatory; it can be paid out in early 2011 when the contract is completed.

To obtain credit, soil disturbance must be limited to 33% or less. Straw and chaff must be left on the field and may not be burned. The purpose of the carbon credit 'exchange' is fulfilled by capturing carbon in a 'sink' rather than releasing it into the air to form greenhouse gas.

Government officials and companies expect new regulations and opportunities for annual contracts perhaps later this year and no later than 2010. It is possible that chopped flax straw on no-till or reduced till land may meet the new regulations.

For more information:

www.c-green.ca

www.flatlander.ca

www.carbonoffsetsolutions.ca

www.chicagoclimatex.com/docs/offsets Conservation_Tillage_Protocol.pdf ■

Forging ahead with human health research

By Kelley Fitzpatrick

Since the fall of 2006, Flax Canada in conjunction with industry and government partners has initiated several clinical research studies in humans aimed at assessing the efficacy of flax bioactives in health and disease. In this issue of Flax Focus, three of six projects are described.

Optimizing dietary n6/n3 fatty acids in disease – oxidative stress and inflammation in adults at risk for type 2 diabetes

The focus of this research under the leadership of Dr. Sheila Innis, Director of the Nutrition Research Program at the University of British Columbia is to assess the potential beneficial effects of a diet high in monounsaturated fatty acids (oleic acid – OA) from canola oil and alpha-linolenic acid (ALA) from flaxseed oil in reducing markers of oxidative stress and inflammation in overweight subjects at risk for type 2 diabetes. The goal is to develop and promote science-based recommendations for dietary fatty acid intakes that prevent or delay the onset of chronic diseases, such as diabetes and other immune and inflammatory disorders, through reducing the burden of oxidative stress and generation of inflammatory mediators.

This ground breaking study focuses on the importance of dietary OA and ALA as modulators of membrane lipid compositions, oxidative stress and the generation of inflammatory mediators; key mediators in the early events leading to a pro-inflammatory state, development of insulin resistance, hyperglycemia, hyperlipidemia and the multiple events associated with diabetes, cardiovascular disease and obesity. Dr. Innis' research is critical to establish definitive evidence that dietary intervention to correct aberrant fatty acid intakes in the population will reduce inflammatory mediators. This will pave the way for diets that incorporate flaxseed based ALA to control and possibly even correct inflammation which is increasingly being viewed as an underlying condition characteristic of many of the chronic diseases common in Western societies.

Flaxseed effects on peripheral arterial disease and diabetes

It is becoming increasingly evident that beneficial nutritional interventions can influence cardiovascular disease (CVD) in a positive manner. A common dietary intervention often used to alter CVD is the supplementation of the diet with omega-3 fatty acids. Flaxseed has the highest level of plant based omega 3 fatty acids (alpha-linolenic acid, ALA). Furthermore, flaxseed also contains lignans that are potent antioxidants and fibre that is known to be beneficial in controlling circulating cholesterol levels.

Previous animal studies by lead investigator Dr. Grant Pierce (Executive Director of Research, St. Boniface General Hospital and the Assistant Dean (Research) and Professor in the Faculty of Medicine, University of Manitoba) have shown dramatic anti-atherogenic, anti-arrhythmic and anti-inflammatory effects of dietary flaxseed. These studies have argued strongly for the initiation of a trial in a clinical

population that may be helped by the cardiovascular effects of flaxseed.

Dr. Pierce and his colleagues have undertaken an ambitious study - the first of its kind – to assess the influence of a flaxseed enriched diet in humans with established CVD. The trial has been designed as a double-blinded, placebo-controlled study to determine the effects of daily ingestion of 30 g of flaxseed on a variety of blood parameters, genomic responses, exercise capacity, cardiovascular surgical interventions, and clinical endpoints in close to 250 patients for two years.

Ten different flaxseed enriched products including muffins, bars, savory rolls and pasta have been developed at the Canadian International Grain Institute in Winnipeg and the Food Development Centre in Portage la Prairie. Ontario based Canada Bread will provide flaxseed enriched and placebo bagels for the study. Manitoba based Pizzey's Nutritionals has generously donated the milled flaxseed used for the food development research and will as well for the entire study period.

The investigators hypothesize that fewer primary and secondary clinical events (mortality, stroke, myocardial infarctions, angina, arrhythmias) will be observed in patients who are ingesting flaxseed in their diet. Secondly, it is speculated that flaxseed supplementation will induce beneficial effects on exercise performance, blood pressure and circulating lipid levels. This trial will generate data on the safety and cardiovascular efficacy of dietary flaxseed in patients with peripheral arterial disease (PAD). It will study the genomic response of this population of patients to this nutritional intervention. Ultimately, this study represents the first test of flaxseed as a cardioprotective nutritional agent in a patient population.

The results of this research could significantly influence the recommendations made by the international medical community. Also, this study has great potential to help patients suffering from PAD. Furthermore, it has the unusual potential to be rapidly translated into applications for the general public to provide health-related benefits at a relatively inexpensive cost.

Efficacy of consumption of flax and canola oils in the management of hypercholesterolemia and other disease risk factors

In conjunction with the Canola Council of Canada, research is being undertaken to investigate the positive effects of alpha-linolenic acid (ALA) and oleic acid from high-oleic canola oil and a flax/canola oil blend on several biomarkers of inflammation and endothelial dysfunction, risk factors for cardiovascular disease (CVD), as well as dietary lipid metabolism and oxidation. The clinical study is ongoing under the direction of Dr. Peter Jones, Canada Research Chair in Nutrition and Functional Foods, at the Richardson Centre for Functional Foods and Nutraceuticals.

It is hypothesized that the flax/canola oil blend will improve the stability of flaxseed oil (for greater acceptance in the mass market), increase the overall ALA level of canola oil and capitalize on the low saturated fatty acid content of both oils.

Assessments will include total lipid profiles, insulin, glucagon and glucose concentrations, inflammatory biomarkers, free fatty acid composition, eicosanoid content, immunoglobin levels, markers of adiposity, total antioxidant capacity and ALA conversion to EPA/DHA. Measurements will also include whole body energy metabolism, determining fat, carbohydrate and total caloric expenditure at rest and after a standardized meal containing each treatment. Dual emission x-ray absorptiometry (DEXA) will be used to assess body composition and percent body fat.

Carotid ultrasounds on a subgroup of subjects are being conducted at St. Boniface General Hospital by Dr. Davinder Jassal for determination of endothelial health through the measurement of carotid intima-medial thickness. This subgroup is also undergoing a novel pulse wave analysis (PWA) which can noninvasively evaluate cardiac information including pulse, systolic pressure, diastolic pressure and other cardiovascular parameters.

This research will generate novel data on several outcomes of health associated with ALA, as well as ALA in combination with oleic acid. ■

Fibre and industrial success stories

by Les Rankin

Flax Canada 2015 is in the process of completing another successful year in assisting the research and commercialization of flax-based products in the fibre and industrial segments of the industry. Flax Canada directs and monitors funding into these worthwhile endeavours on behalf of Agriculture and Agri-Food Canada (AAFC). There are some good examples of success in this year's operations:

- Funds directed by Flax Canada have been used successfully to evaluate and demonstrate, under a biorefinery concept, the conversion of shive from flax straw into a liquid that appears to hold promise as a biofuel, using a high temperature procedure called pyrolysis. In our current energy-based economy this has strong potential for commercialization.
- Developing the equipment and the procedures for compressing flax shive into high density manufactured logs suitable for burning in a home fireplace is another ambitious undertaking. Using AAFC funding, combined with a larger amount of private funding, this has now been accomplished by a company which plans to move into the commercialization stage within a few months.
- Successful seminars were hosted by Flax Canada in each of the three prairie provinces where Forbo , the world's largest linoleum manufacturer presented the company's Life Cycle Analysis as an illustration of the highest standard for a truly "green " product. Linoleum is approximately 35% linseed oil and Forbo chooses to use only linseed oil from Canadian flax. These seminars create excellent awareness among the planning and purchasing departments of provincial governments so that when the time comes to build or refurbish hospitals and schools, they know they can be both environmentally-friendly and support a prairie grown crop.
- The ongoing process of separation and classification of the various components of flax straw is a requirement in producing a market ready product. Several projects have achieved the objectives of producing large scale sample quantities of flax fibre with significantly reduced shive content, making the product available to a number of potential customers for testing. ■

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

www.fc2015.ca

FC2015
Flax for all Reasons

a wholly owned subsidiary of the
Flax Council of Canada

Flax Focus is an electronic publication of the Flax Council of Canada. Letters, enquiries and comments are welcomed, and may be directed to the Editor, Barbara Metrycki. Staff of the Council are: President, Barry Hall; Executive Assistant, Monika Haley; and Financial Administrator, Maureen Jordan. The Board of Directors of the Council, under Chair, Eric Fridfinnson, is listed at www.flaxcouncil.ca

www.flaxcouncil.ca

Flax Council of Canada