



Caring for Body and Soul

It takes a lot of passion to grow food. It also takes a lot of passion to grow crops that promote the well being of people in other ways. Lance VandenBorn of The Farmer's Company has passion galore – for the environment, for health, and for the well-being of Canadian farms. He is applying this passion to create new products for agriculture.

As always, research is the foundation for new products and new ideas. That is the first creative step, but it takes many more creative leaps to get a product into consumers' hands. VandenBorn's dream is to create a true value chain that extends from seed to the consumer by developing consumer products from oilseeds. "I want to bring local farmers to local tables," he explains.

His first foray into this effort has been his Thompson Valley Farms oils. These cold pressed oils are made from flax, canola, safflower, and hemp seed, although certainly his hemp products have garnered the most attention. Focused on the natural products sections established in many health food and grocery stores, VandenBorn has found places are struggling to find enough products to stock these sections properly.

Ironically, just as he was getting his product into these stores in 2000, the drought hit and his supplies of seed for crushing were cut back. Realizing quickly that this could mean trouble for his fledgling business, he redeveloped



products. "We had to develop the highest value product to survive the drought," he says quite simply. In assessing the returns gained per pound of seed, VandenBorn saw opportunity in the body care market. It turns out, to produce \$250,000 of gross revenue from oil it takes about 120,000 pounds of crop, but just 6,000 pounds of crop produces the same value in body care products.

With funds from ACIDF, The Farmer's Company developed an emulsifier that allowed him to prepare 1,500-litre vats of body products such as soaps, lotions, sunscreens, face wash, lip balm, and hair conditioner. "Natural lines are one of the fastest growing segments of the cosmetics business," VandenBorn reports.

Funding also supported new

packaging and a marketing plan. Selling out of the Strathcona market in Edmonton starting this fall, he did a booming business in body care products during the holiday season. His next plan is to refocus on the grocery store and drug store market. Specialty retailers are great he says, but the vast majority of the dollars get spent in main line stores.

The practical skills he exhibits as a marketer do not diminish his passion for what he does, however. "I can't explain how wonderful it is to hear about how much a product means to people," says VandenBorn. He talks about repeat clients who are already enthusiastic about his natural products that come right from Alberta farms to nourish their stomachs, bodies, and souls.

Tell It Like It Is

The fact is agricultural research is one of the best investments the province and country can make. It boasts an 8700% return for every dollar spent, partly because the farm economy doesn't just stop at the farm gate. It delivers all the way to every table in the country. The Alberta Crop Industry Development Fund and its partners in the Alberta Agriculture Funding Consortium have started working together to do a better job of telling this story.

It started with R&D: Reach & Discover, a new magazine highlighting the results of agricultural research throughout the province.



We've Got a Lot to Talk About!

ACIDF has been funding lots of great projects all over this province. To learn more about new ideas, interesting findings, and fascinating results call us.

We'll arrange a speaker for your meeting on a ACIDF-funded project relevant to your organization. From pre-treating barley, to value components in peas, honey bees, and beyond, there's an engaging world of great stories.

Book now for your annual meeting or other event.

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It started with *R&D: Reach & Discover*, a new magazine highlighting the results of agricultural research throughout the province. The stories are written in an accessible format and are sent to media outlets throughout the country to encourage them to reuse this material in their own programming. It's a great start, and it's just the beginning.

ACIDF has already taken on several other initiatives to highlight our Fund's work and the work of the Consortium. Press attention was focused on the exciting work to make barley a rapid-cooking product for easy meal making, and later this month we

r&d

will be holding a press conference to focus attention on the elements of pulse crops needed to make all sorts of foods.

We've changed the look of our own newsletter and have prepared some handy fact sheets, both our own and the Consortium's, to highlight the benefits of agricultural research. The fact is, unless we make the case for the value of R&D, we risk losing the focus and resources we already have. Every signatory of ACIDF, every member of the Consortium, every researcher, and every farmer needs to explain the vital role of R&D in our industry. Please join us in telling it like it is.

Focused on Funding Valuable Crop Research

The Alberta Crop Industry Development Fund is committed to improving Alberta's agricultural economy. By funding new research that focuses on consumer needs, ACIDF ensures agriculture is productive for both producers and researchers. But we also see agriculture as part of the bigger picture and aim to fund projects that relate to all aspects of agriculture in Alberta life.

Here are some of the highlights of ACIDF's research:

ACIDF truly cares about consumers.

ACIDF cares about consumers. That's why we're funding research that will help consumers access the health benefits of barley. Barley is a low fat grain and a great source of dietary fibre and calcium. It helps reduce cholesterol and regulate blood glucose levels. With a low glycemic index, barley plays a role in maintaining the blood sugar levels of diabetics. Currently, barley is underutilized as food source because of its lengthy cooking time. Research at the Centre for Agri-Industrial Technology has found ways to significantly reduce barley's cooking time which will result in value-added products becoming available to consumers – so they can reap the health benefits.

ACIDF also cares about the environment.

ACIDF cares about the environment. Bioplastics are an alternative to conventional plastics made from fossil fuels which are in finite supply and aren't biodegradable. Bioplastics – which can be made from canola or flax oils – come from a biodegradable and renewable source, namely Alberta's fields. ACIDF recognizes the market opportunity of bioplastics and funds research into developing feasible methods of producing this unique commodity from agriculture.

ACIDF cares about small business.

ACIDF cares about small business. By providing assistance to enterprising and entrepreneurial farmers who wish to diversify their business, ACIDF ensures more value-added agricultural products make it to market. Funding from ACIDF gives entrepreneurs a broader scope and raises their profile with distributors and retailers alike. A great example is the The Farmer's Company, a successful retailer of Alberta-grown hemp oil products.

ACIDF cares about making crops better.

ACIDF cares about making crops better. Alberta is a major potato producing province in Canada and our farmers produce a quality crop. However potato production in Alberta is not without its challenges. Southern Alberta normally experiences greater extremes in temperature, has relatively low humidity, and utilizes irrigation for potato production. ACIDF is funding research into how temperature affects potato growth and quality. With this valuable information farmers will be able to use the best management practices available to get the most out of our potatoes and encourage the expansion of the \$350 to \$400 million potato processing industry in the province.

Return on Investment

It's safe to say that research and development is important in an industry. But just how significant is it? In the case of agriculture, you can measure its magnitude by the return on investment of 8700% – or \$87 for every \$1 invested – which is a high return by any standard!

Source: Klein and Hobbs. 1997. Socio-Economic Impacts of Selected Research Projects in AARI Matching Grants Program.



What's for Dinner?

What's for dinner? It's the age-old question that stumps many of us each and every day. Thankfully, there could soon be a new option to consider when preparing your menu. Barley, not usually thought of as a side dish, may soon be gracing the dinner table more often.

Barley has many health benefits and would be a great addition to a healthy diet. The challenge is that it is a slow cooking grain and consumers generally aren't willing to invest the 45 minutes to an hour it takes to cook in order to reap the health rewards.

Hong Qi, Project Engineer at the Centre for Agri-Industrial Technology in Edmonton, heads up a project that has reduced the cooking time of barley to just 15 minutes. This means consumers will be able to access the important health components much more easily.

"Barley has many health benefits that just aren't being utilized by the public," says Doug Walkey, Executive Director of ACIDF. "Quick-cooking barley will give consumers the ability to reap the rewards of barley as part of a healthy diet and will provide new markets for Alberta barley producers – a win-win situation for everybody."

Just what are these important health components? Barley is a low-fat grain and contains many beneficial elements. One of these is beta glucan, a soluble fibre that has been shown to regulate blood sugar levels and reduce cholesterol. In addition to soluble fibre, barley also contains insoluble fibre which is linked to protecting against colon cancer, although this has yet to be confirmed by more research. Barley also contains B vitamins which are essential for all around health and help with metabolic activity. Tocotrienols and tocopherols – natural antioxidants – are also found



in barley. Antioxidants are thought to play a role in preventing cancer, heart disease, and stroke.

With all these reasons to include barley in your diet, the Alberta Crop Industry Development Fund and the Alberta Barley Commission, along with Alberta Agriculture, Food and Rural Development, have provided the resources to fund the work of Qi and her team.

Marvin Nakonechny sits on the Board of ACIDF and is a barley producer interested in marketing value-added barley products. He enjoys the

taste of barley but acknowledges that previously barley wasn't being used because it took so long to prepare. "Quite often our food choices are spur

of the moment. You get home, decide on something to make and in a half hour you're eating," says Nakonechny. "Barley doesn't lend itself to that, but the products we're now making are designed to be user-friendly."

With phase one of the research now complete, which saw the process for reducing the cooking time perfected, work has begun on product development. Nakonechny sees barley as a substitute for rice. "Barley absorbs flavouring, it can be reheated, and it gives us dietary fibre – which is another reason to include it as part

of a nutritious diet. Barley has advantages over rice in that it has more fibre and beta glucans. With barley we now have a very healthful product to add to our diets that can be used in combination with other foods."

Qi says there are many uses for quick-cooking barley. Some potential targets include restaurants or institutional settings like hospitals or personal care homes. One potential product is barley that you mix with a packet of seasoning, and voila, you have a tasty side dish ready in 15 minutes. Nakonechny envisions other uses for barley as well. Barley has a place in salads, soups, breakfast cereals or bars, and maybe even in snack foods one day. The possibilities are endless. Nakonechny even uses it in turkey stuffing for Christmas and says it can be used as a thickening agent in stews.

The Alberta Barley Commission, which also funds the research, encourages the use of barley as a food. "We've studied ways of increasing value-added barley consumption in the past. This work opens a window of opportunity to successfully market barley to consumers," says Clifton Foster, General Manager at the Commission. "It's an important piece of research from our perspective."

Together, the industry is working to make barley an answer to the question "What's for Dinner?" and could create some big benefits for consumers as well as farmers.

"Barley has many health benefits that just aren't being utilized by the public."

- Doug Walkey

Better Oats, Better for You

If there was a food that could reduce cholesterol levels, lower blood pressure, decrease risk of diabetes, and increase your body's immune response, you would eat it wouldn't you? Would you be surprised to discover that oats have been identified as a food source that can deliver all of these health benefits? It is precisely because of the demand for healthier foods that Alberta has focused some of its research resources on oats.

Oats have always had a reputation as a healthy and versatile food, but now researchers funded by the Alberta Crop Industry Development Fund Ltd. (ACIDF) are looking at innovative ways to improve nutritional and quality characteristics that could generate completely new uses for the traditional crop. Oats are a source of many important nutritional components that can really have a positive impact on human health. "Often, oats are considered lower quality food compared to other crops – that's unfortunate. We are working to change that," says Doug Walkey, Executive Director of ACIDF. Despite the health benefits of the crop, the best oats typically go to horse feed. Horse owners want white, plump, well-shaped oats and pay for it. The second grade oats go to human consumption, primarily into breakfast cereals. The lowest grade oats end up in the feed market.

"The oat industry is an interesting one. Typically, oats are planted as a second choice crop. They are planted last in comparison to other crops, but to get the most of it, they should be considered the same as other crops and get the same attention," says Walkey.

Driving downstream benefits from the crop is important in achieving maximum returns from oats, so ACIDF-funded research on oats is focused on value-added benefits and new food uses. The first project focuses on the value-added benefits of extracting beta glucans from oats, and using them as food amendments/additives. "It's about the custom formulation of

Inside Oats

Components of oats with specific health benefits include:

- Beta Glucan – reduces cholesterol, regulates glucose levels, stimulates immune response, reduces heart disease, reduces risk of Type 2 Diabetes.
- Tocopherols – inactivate free radicals and other harmful compounds, thus reducing risk of heart disease and cancer, and possibly slowing cellular aging.
- Phenolics – similar benefits to Tocopherols.
- Phytosterols – reduce cholesterol, reduce risk of cardiovascular disease, reduce risk of colon, breast, and prostate cancers.

foods and increasing fibre in low fibre foods," adds Walkey.

Beta Glucans

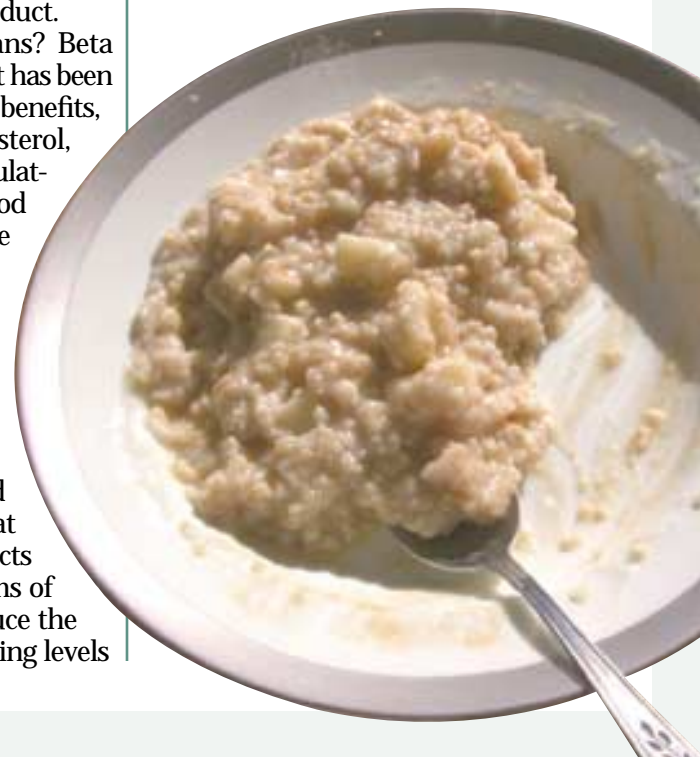
Dr. Thava Vasanthan is a University of Alberta researcher investigating beta glucans. His research covers three areas: development of cost efficient technologies for beta glucan extraction from oats and barley, the use of beta glucans as a food additive, and the food and non-food applications for the by-product, after the beta glucan is removed. If successful, this research would demonstrate that oats and barley could be used as a commercially viable source of beta glucans, while possibly improving the feed quality of the by-product.

Why look at beta glucans? Beta glucans are a soluble fibre that has been shown to have several health benefits, including lowering cholesterol, regulating glucose, and stimulating the immune system. Good sources of beta glucans include oats, barley, yeast, bacteria, and some fungi. Many studies have shown the positive health benefits of increasing the level of beta glucans in the diet, to the point where the Food and Drug Administration in the U.S. has allowed food makers using whole oat products to claim that products containing at least 0.75 grams of soluble fibre per serving reduce the risk of heart disease by reducing levels

of cholesterol.

In order for oat beta glucans to be used more widely, viable methods of extracting them from whole oats must be developed. Vasanthan, in collaboration with Dr. Feral Temelli, is applying new patented technology to the fractionation of oats in order to separate the beta glucans. Creating a reliable, high quality product is very important in developing food additives.

Once the beta glucans have been extracted, Vasanthan and Temelli are investigating using this oat product as a food additive to increase the fibre levels of low fibre foods. The key is determining if the health benefits of beta



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glucans in oats can be transferred to other foods that would not normally contain sufficient levels of soluble fibre.

An interesting side benefit of Vasanthan and Temelli's work is that the remaining oat product, after the removal of the beta glucans, may be a more efficient feed product. So an additional aspect of the project is a feeding trial to investigate the possible benefits of feeding oats post-beta glucan-removal. "Some feel that with the reduced fibre content, the material may actually be higher in feed energy," notes Walkey. This demonstrates an excellent opportunity to drive value right through the chain. From developing production technology for a new food additive to finding a beneficial use for the by-products, it should all translate into more value.

More than Just Oatmeal

Until his untimely death this summer, Dr. Solomon Kibite was an oat breeder with Agriculture and Agri-Food Canada in Lacombe, focused on making better food oats. He described his work this way: "Traditionally, oats have been used for breakfast cereals and muffins. We are trying to find new uses for oats in pasta and noodles as well as

improve nutrition through increased antioxidant levels." Thus, a focus for his breeding program was increasing the levels of antioxidants in improved oat varieties.

There has been a lot of work on increasing antioxidants in oats in China, making Chinese varieties more nutritious. He explained that the goal is to develop improved oat varieties with higher antioxidant levels that would be successful in Alberta. Since there is no industry accepted level yet, part of the work is to establish how high increased levels of antioxidants need to be.

Antioxidants are compounds that clean free radicals and other unstable chemical compounds from cells. Damage by free radicals has been implicated in aging, heart disease, and cancer; thus the ability of antioxidants to protect the body from damage by free radicals might help reduce the risks associated with these conditions. Oats contain two types of antioxidants, tocopherols (better known as Vitamin E) and phenolic compounds. The phenolic antioxidants are different compounds but function in a similar fashion to tocopherols.

Drs. Kevin Swallow of Alberta Agriculture, Food and Rural Development's

Food Processing Development Centre, and Bin Xiao Fu of Canadian International Grains Institute are working with material from Kibite's breeding program to investigate the use of oats in making pasta and noodles. Swallow is enthusiastic about the opportunity to take a product, in this case oats, and develop it into something never before utilized in Canada. He applauds Kibite's vision. "He could see the versatility of a traditional grain and use it for novel applications," he says. "The health benefits to be gained from oats is the major attribute of Dr. Kibite's work."

By modifying certain quality characteristics, the improved oats could become a new ingredient in the growing pasta/noodle market. This would create a unique new market for the use of oats and oat products that would offer a more nutritious product to the consumer, making oats more than just a breakfast food.

So the next time only oatmeal leaps to mind when considering oats, think of a world of possibilities. From specialized noodles and pasta to extracted beta glucans, oats have the potential to positively affect our health.

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Dr. Solomon Kibite Remembered

Dr. Solomon Kibite, an oat breeder with Agriculture and Agri-Food Canada (AAFC) in Lacombe, passed away suddenly on August 20, 2003 at the age of 54. Before his untimely death, Dr. Kibite focused his research energy on barley, oats, and wheat, developing 13 different varieties as well as many other lines that are used in breeding programs internationally. Since 1995, he concentrated exclusively on oats. AC Morgan, a variety he developed, is the highest yielding and most widely grown oat variety on the western prairies.

Kibite was studying the special characteristics of oats and finding new food uses for the crop as well as applications in the cosmetics and nutraceuticals industries. His current work will be completed to ensure the new lines get out.

Heavily involved in the international plant breeding community, Kibite published many papers on cereal breeding and genetics. He offered plant breeding courses in China, conducted extensive collaborative research with scientists across Canada and the United States, and was a respected member of the Executive Committee of the International Oat Conference and Chair of the American Oat Workers' Conference.

"Everyone was surprised by the amount of collaboration he was able to achieve," says Dr. George Clayton, a colleague and friend at AAFC. "He was very quiet and unassuming, and never bragged, but he was a great leader; very generous, very kind, and very respectful of everybody in the office. He will be greatly missed."