

reach&discover

→ Agricultural Research and Innovation in Alberta ←

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New
Ground

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Alberta is all about innovation. Albertans have always been forward thinkers and *Reach & Discover* captures a new wave of leaders in agricultural research and development.

Science is making the most of food, fibre, and bioresources, in ways that change daily lives. So, as Alberta REACHes to add value to agriculture and DISCOVERs wonderful new uses for agricultural resources, we invite you to join us in exploring the exciting world of research and development.

Reach & Discover is brought to you by the members of Alberta's Agriculture Funding Consortium. The Consortium provides an innovative approach to coordinating agricultural research and development funding and aligning projects with industry-wide goals. Each member organization retains its own identity and funds a range of projects in its target area – but also gains efficiencies from sharing a single approach to application and joint-funding opportunities.

We welcome reprints, with acknowledgement, of *Reach & Discover* stories.

Reach & Discover won a Certificate of Merit in the category of Public Relations – House Organs at the 2004 Best of CAMA (Canadian Agri-Marketing Association) Awards. The Best of CAMA is the agriculture industry's annual showcase of creativity, marketing, and communications expertise.



Members of Alberta's Agriculture Funding Consortium

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Desirable Destination



It's no wonder Canadian universities fared so well in a recent survey of the best places for academics to work. In Alberta and across the country, governments, as well as countless other agencies, have been building a science-friendly research environment, and researchers worldwide are taking note.

For the first time, five Canadian universities are in the top 10 Best Places to Work in Academia, according to the 2004 survey appearing in *The Scientist* magazine. The University of Toronto topped the list, with the University of Alberta right on its heels in second place. Dalhousie University placed fourth, with McMaster University and the University of British Columbia placing seventh and ninth, respectively. In a web-based poll sent to more than 35,000 scientists, these Canadian universities out-ranked other Canadian and European institutions. Institutions in the United States were ranked separately.

It's no fluke that Canadian universities fared so well in the survey. When you think about all the things that are important to a researcher: available laboratory space, research facilities, equipment, funding, and opportunity, it's no wonder so many are drawn to Canada. During the last decade the federal and provincial governments, as well as countless other

groups such as Alberta's Agriculture Funding Consortium, have invested billions of dollars into infrastructure upgrades and funding for innovative research programs all in an effort to create a science-friendly environment bursting with opportunity. Alberta, in particular, offers a pioneering research environment with inter-agency partnerships and accessible funding, drawing a mosaic of scientists from Canada and abroad.

The survey asked life scientists, either working in academia or other non-commercial research institutions, to assess their working conditions and environments by indicating their level of agreement with 39 positive statements, based on a scale of 1 to 5, in 8 different areas. Respondents were also asked to indicate which factors are important to them. All factors were weighted according to the number of respondents who considered them important, with overall rankings being based on the weighted average score for each institution. And while the sample of respondents was both large and self-selected, introducing some bias into the results, no attempt was made to standardize the results or to conduct detailed statistical analysis on them.

Among the group of scientists attracted to Alberta and the University of Alberta (U of A) in particular, is Dr. Stephen Moore, Professor and Industry Chair of Beef Genomics. "In my mind the University of Alberta is number one in North America in terms of reputation and standing," says Moore. Moore came to the U of A because he was interested in the new and emerging area of beef gene sequencing and saw an opportunity to progress in this field. "The position is

supported by the beef industry and that was attractive because you need industry support and involvement to be successful in this field," says Moore.

Dr. Olga Kovalchuk, Assistant Professor, Department of Biological Sciences at the University of Lethbridge, is another scientist attracted to Alberta. "Alberta is a good place to do research – there is lots of opportunity for funding," says Kovalchuk. With the help of funding from AVAC Ltd. and the Alberta Agricultural Research Institute, this world class researcher is investigating different native plant extracts for anti-inflammatory and anti-cancer activity in the hopes of developing new plant-derived drugs that can be used to fight cancer and other diseases.

There were other work-related factors drawing Kovalchuk to Lethbridge. "The infrastructure is good, with available laboratory space, support for grant applications, and good communication between peers," says Kovalchuk. These are some of the factors survey respondents indicated as being important to them.

How will Canadian universities fare in the next survey? As a land of opportunity that supplies a collaborative research infrastructure and ample funding for diverse projects, Canadian universities will likely continue to be viewed as desirable destinations for academics from around the globe.

The survey ranked institutions based on scores in the categories of:

- Peers
- Infrastructure and Environment
- Research Resources
- Pay
- Benefits
- Teaching and Mentoring
- Tenure
- Management

The survey did not include coordinated funding in its rankings. If it had, Alberta's universities likely would have ranked even higher.

Centennial Success

Highlights from a few of Alberta's great agricultural innovations.

Agriculture in the province of Alberta has come a long way since 1905. New technologies, management practices, and economic environments have challenged Canadian agriculture and transformed our country into the breadbasket of the world.

The root of this growth lies in agricultural innovation. Research and development created the first wheat variety suitable for the Canadian Prairies, and R&D continues to be vitally important today as we strive to feed a global population that is expected to exceed 10 billion by 2035. Alberta's Agriculture Funding Consortium supports and fosters agricultural R&D, making the province a leader in this area. As Alberta celebrates its 100th anniversary, it is only fitting we recognize some of the great agricultural innovations that helped pave the way for Alberta's success – most of which were accomplished by Albertans themselves.



Alberta Legislature Building

1905

Alberta, named after Princess Louise Caroline Alberta, fourth daughter of Queen Victoria, became a province of Canada on September 1.



Round up

1906

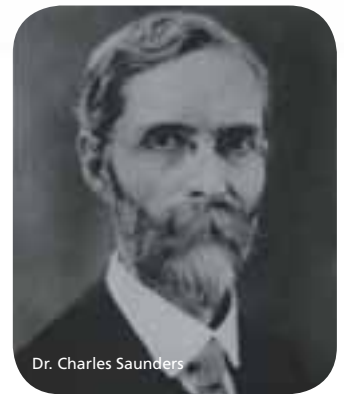
The federal government recognized the need for an experimental farm in the new province of Alberta and established the Lethbridge Research Centre. From innovative irrigation methods to new forage varieties to livestock breeding, this Centre proved to be the foundation of agricultural R&D in the area.

This year also marks the start of several advancements in irrigation. Penrose Sauder instituted the first regular hydrometric surveys in southern Alberta and Saskatchewan, and spent the remainder of his almost 70-year career devoted to advancing irrigation in this area of the province.

1909

The Bow River Irrigation Project, one of the major irrigation schemes in Western Canada, was started in 1909. By 1921, 9,500 acres were under irrigation with crop values averaging \$24 per acre; four years later, these numbers rose to over 13,000 acres and revenue of over \$42 per acre.

The project currently provides water to some 120,000 irrigable acres, with the potential to double in the future.



Dr. Charles Saunders

Marquis wheat, developed by Dr. Charles Saunders, was made available to farmers. With its early maturity, good milling characteristics, and 20-40% yield advantage over Red Fife, Marquis quickly dominated Canadian production – accounting for 90% of Western Canada's spring wheat acres within 10 years – and brought agricultural and economic prosperity.

1921

Dr. Asael Palmer joined the Lethbridge Research Centre. His elaborate irrigation and soil



erosion research and practical demonstrations culminated in a bulletin entitled *Use of Irrigation Water on Farm Crops*, which endured and was reprinted five times. The first to recognize the value of trash cover, Palmer advanced the adoption of modern farm practices.

1936

Working closely with Lethbridge researchers, Charles Noble created the Noble Blade cultivator. The v-shaped blade cut weeds off at the roots without disturbing the soil surface, revolutionizing the world of farming.

1940s

Andy Briosi, a well-respected Alberta farmer, invented the front-end loader and sugar beet lifter. Patented in 1952, the beet lifter modernized sugar beet harvesting, a time-consuming process traditionally done by hand.



1955

The Lacombe breed of hog was officially named. Developed by Dr. Howard Freeden at Agriculture Canada's Lacombe Research Station, this was the only breed of farm livestock to originate in Canada. This white hog, characterized by a rapid rate of weight gain and meaty carcass, is now propagated in over 20 countries and exported throughout the world.

1960

Dr. Roy Berg, a pioneer in animal genetics, established the University of Alberta's Kinsella Ranch. His innovative research into crossbreeding techniques became the norm in commercial breeding and led to a 30 to 40% increase in production, contributing to Alberta's status as a world leader in beef production.

1961

The collaborative effort started in 1946 between the Ag Canada research stations in Saskatoon and Lethbridge to find bacterial wilt resistant alfalfa culminated in the licensing of Beaver alfalfa. The first alfalfa variety resistant to bacterial wilt, Beaver is still recommended for Western Canada and remains the standard to which other varieties are compared.

1966

Boreal creeping red fescue was developed at Ag Canada's Beaverlodge Research Station. This strong and uniform creeper has good vigour and is a high producer of both seed and herbage. Boreal became the standard for a lot of future breeding work and is still the main variety of creeping red fescue grown for seed in Canada, with almost 100% of that grown in the Peace River region of Alberta.

1969

Dr. Robert Church founded the Department of Medical Biochemistry at the University of Calgary. He created the first commercial embryo transfer company, contributed to the establishment of 11 new high technology companies in Alberta,

and authored over 100 scientific publications in animal genetics and biotechnology – providing the foundation for many techniques commonly used in cattle today.

1973

The Field Crop Development Centre at Lacombe was established with Dr. James Helm leading the R&D program on feed barley. Focusing on disease resistance, high yielding hullless barley, and semi-dwarf barley, this program has released almost 20 registered varieties which have delivered outstanding returns to Alberta farmers.



1974

The first canola variety was registered by Dr. Baldur Stefansson at the University of Manitoba. Alberta's own Michael Hugh took canola processing and marketing to the next level by starting Western Canadian Seed Processors, now known as Canbra Foods, which opened the first edible oil extraction plant in the province at Lethbridge.

1978

Dr. Wayne Lindwall of Agriculture and Agri-Food Canada's Semiarid Prairie Agriculture Research Centre pioneered the concept of reducing tillage and inspired a handful of Alberta farmers to adopt the practice on their own farms – practice that has since become commonplace.

1986

Barrier alfalfa, the first Canadian variety with resistance to both bacterial and verticillium wilt, was licensed. Barrier was one

of several forage legume varieties released under Dr. Mike Hanna's program at the Lethbridge Research Station and became the standard for a lot of future breeding work. Dr. Hanna's program also developed the sainfoin varieties Melrose in 1972, and Nova in 1980 – now Canada's top two sainfoin varieties.

1995

Quantum canola was developed by University of Alberta plant breeder Dr. Gary Stringam. The variety set the standard for blackleg resistance.

2000 – Present

SemBioSys Genetics Inc. develops a plant-based pharmaceutical for use in the fight against breast and other cancers, arthritis, psoriasis, and allergies.

CV Technologies Inc. develops Cold-FX, a natural health product derived from ginseng.

Dr. Surya Acharya, a plant breeder at the Lethbridge Research Centre, develops a new forage crop, perennial cereal rye.

Alberta leads the way in commercializing the technology that produces plastics from canola and flaxseed oil. **r&d**

The Next 100 Years

In the next issue of *Reach & Discover*, we ask industry experts to predict where R&D will take agriculture over the next century.

Incubating Success

To get a sense of the scope of agricultural research activity taking place within Alberta's borders, one needs to look no further than the pages of this magazine. A new food processing business incubator will help ensure this research reaches the grocery store shelf.



The Alberta Advantage is a strong one, and with more food processing companies wanting to capitalize on Alberta's favourable tax structure, the availability of raw commodities, and proximity to markets – both in the United States and the Pacific Rim – there's a need for more facilities to support these companies. The Food Processing Development Centre (FPDC) in Leduc already allows businesses to develop food products from the idea stage through to the market stage, but there isn't a facility that allows for initial commercial scale-up of products.

That's where the Agrivalue Processing Business Incubator comes in. A joint project of AVAC Ltd. and Alberta Agriculture, Food and Rural Development (AAFRD), the Incubator will offer assistance to new food companies starting up in Alberta, providing a key link in the food processing chain. "This facility will give Alberta's emerging entrepreneurs the resources they need to succeed in the marketplace by providing dedicated production facilities, business-planning guidance, and access to industry expertise," said Shirley McClellan, Minister of AAFRD at the time of the facility's groundbreaking.

Keith Jones, President and CEO of AVAC Ltd., describes the facility, expected to be operational in January 2006, as a place where small food companies or entrepreneurs can take their newly developed products and produce more of them in a supportive environment. "AVAC and AAFRD started to appreciate that there was not a place in the province where companies that had developed a product and now wanted to start producing initial volumes of it for the market could actually do that," says Jones. "The bottom line is, in Alberta we have a good ability to create new products and produce at a bench top or lab scale, say 50 pounds of the new product a week, but what we really need is a place where you could produce 500 to 1,000 pounds per week of product to move into the market."

Jones explains that without a place to do these smaller scale productions, companies would need to be selling, for example, 5,000 pounds a week or more to be able to afford their own facility – somewhat of a horse before the cart scenario. The

“Without a place to actually get started producing commercial volumes it was difficult to take the next step toward economic viability.”

– Keith Jones, AVAC Ltd.

Incubator is an intermediate step where companies can produce smaller volumes of their new food product to move into the distribution system, without the initial capital investment required to build their own facility.

Perfect Timing

The Agrivalue Processing Business Incubator couldn't come at a better time. "We have the Alberta growth strategy which aims to double the size of the food processing industry in the province by 2010," says Ron Pettitt, Director of the Processing Development Division of AAFRD who oversees the FPDC. "A lot of people have bought into that, especially within the private sector. We've had so much business at the Food Processing Development Centre, we needed some way to take the pressure off. The Incubator allows us to do that."

"The concept and planning of this new facility began long before the challenges of BSE; however, the timing couldn't have been better. It will be an important component of Alberta's six-point BSE recovery strategy, assisting with market and product development," says Doug Horner, Minister of AAFRD. "Today it is not about waiting for the border to open, it's all about restructuring and finding innovative new opportunities in the face of adversity."

The Incubator Concept

The Incubator will be connected to the FPDC. "The whole concept is you help companies grow in a friendly environment so they can move on in a successful way," Pettitt says. This friendly environment has a lot to offer companies. After signing a lease for one of the eight bays (which range in size from 2,000 to 5,000



The ground breaking ceremony for the Agrivalue Processing Business Incubator was held in the fall of 2004. From left to right: Aaron Falkenberg, Chair of AVAC; Shirley McClellan, Minister of Agriculture at the time and now Minister of Finance; and Ty Lund, Minister of Infrastructure at the time and now Minister of Government Services.

square feet and can accommodate anything from meat processing to jams, jellies, and condiments, to whole meal replacements, to baked products) the company gets access to shared refrigeration and freezer space, along with a whole host of business services.

Within their own bay, companies will be able to run their suite like it's their own plant. "They will have their own staff, their own equipment, and they can even run a double shift if they want," says Pettitt. The Incubator will be registered by the Canadian Food Inspection Agency, which means that companies working out of it can sell products interprovincially and even internationally.

And the \$21.2 million facility won't have any trouble getting clients. There are already six clients from Alberta who have expressed interest, and in the future other companies outside the province or even the country may want to do product scale-up work at the Incubator. "Clearly, the focus is initially to assist Alberta companies," says Jones. "But having said that, we know if Alberta companies are going to be successful, they need to partner right across Western Canada, and into other markets as well," he adds. "For example, an established food company may want to do product development work and initial scale up work at the Incubator because it would be really expensive to do inside their own factories, due to tying up plant operation time for new product development work."

Incubating an Investment

The \$5 million that AVAC invested into the Incubator fits well with its mandate. "We viewed this investment as an investment in the capacity of Western Canada to help create economically viable new food companies," says Aaron Falkenberg, Chair of AVAC. "We had done previous investing that provided coaching and financial support to get products developed, but without a place to actually get started producing commercial volumes it was difficult to take the next step toward economic viability."

This new Incubator will benefit not only the companies using it, but also Alberta as a whole. "This project should give Albertans confidence that the money invested in research is actually going to help drive some economic value down the road by providing an ability to take the fruits of the really good research and then allow them to grow and be nurtured into full-sized enterprises," says Falkenberg. "Without it, there is a risk you do lots of great research and then the results go somewhere else to become really strong businesses."

With statistics showing that 80% of the companies that grow in business incubators succeed, there are pretty good odds that Alberta's food processing industry will continue to flourish with the new Incubator in place.

r&d

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The Path to Great Taste

Alternative meats have producers and consumers taking a new direction, resulting in an exciting new list of choices for dinner.

It's not the same old thing for dinner anymore. Consumer interest in, and acceptance of, alternative meats is on the rise. Alberta producers have responded by trying their hand at farming all kinds of exotic meats, bringing them front and centre on plates worldwide.

Home Cooking

It was in the kitchens of Canadian Rocky Mountain Resorts' (CRMR) Buffalo Mountain Lodge in Banff, Deer Lodge in Lake Louise, and Emerald Lake Lodge in Yoho National Park that "Rocky Mountain Cuisine" was created. Set in pristine mountain surroundings and characterized by stone hearths and lofty post and beam ceilings, these rustic yet very elegant lodges were a natural place to introduce regional alternative meats. "Tourists come to Canada and expect to have the opportunity to eat some of our indigenous foods," says CRMR's Executive Chef Alistair Barnes. "It made sense to create a menu based on this concept." Guests from around the world have quickly acquired a taste for this exciting new dining concept and now the venison, caribou, elk, and buffalo dishes expertly prepared account for half of the meals served.

The road to culinary success, however, has not always been smooth and research funded by members of the Agriculture Funding Consortium is helping to address the challenges of this burgeoning industry.

Barnes says that in the beginning, as the demand for quality alternative meat grew, so did the challenge of finding reliable, quality local suppliers. "There was great market potential at the time but a poor and inconsistent supply of meats," he explains. To address the problem, in 1996 CRMR established its very own farm, Canadian Rocky Mountain Ranch, on 540 acres of lush rolling foothills just southwest of Calgary.

Now, Rocky Mountain's three affiliated lodges and four restaurants in Calgary all benefit from a reliable supply of locally-grown, naturally-raised alternative meat which includes elk, buffalo, and reindeer. "Not only do we benefit by having access to research to ensure our animals are handled properly, but the distance from pasture to plate is minimal, allowing

us to respond to any customer concerns, interests, or demands very quickly," says Barnes.

Meat Market

Dr. Terry Church, a former veterinarian, manages the ranch. Just like beef, not all cuts of alternative meats are held in the same esteem. Restaurants want to serve high-end cuts like tenderloin, striploin, and ribeye on their menus, leaving a real gap for some of the lower-end cuts. While the white-table-top market is the ranch's primary focus, the ranch has been able to find other avenues to sell a variety of its value-added products. "Some products like bison burgers are making their way into the mainstream, and many of our frozen products like buffalo pastrami, elk sausage, bacon, jerky, burgers, and hot dogs can be found in gourmet delis and butcher shops," says Church.

Marketing alternative livestock is always a challenge and requires a significant investment of time and energy. Unfortunately, most small producers are so busy fine-tuning their production they don't always have the capacity to undertake the task. Rick Bernard, a bison meat broker and general manager with the Alberta Wapiti Products Co-op, says his group of 155 elk producers formed the co-op close to five years ago to provide consistent, premium ranched elk meat on an ongoing basis, and to create unique marketing opportunities for products such as elk sausage and jerky. The co-op has already made significant shipments of elk meat to the United States and Europe.

Bernard says he has seen the industry grow enormously over the last three years for both bison and elk. "People are looking for alternatives to traditional protein sources and these meats hold a lot of appeal as they are low-fat, low in cholesterol, and high in iron." Most of the co-op's meat is sold in natural food stores.

Hog Wild

Other farmers are exploring the potential of goat, llama, and wild boar meat. Earl and Deb Hagman of Hog Wild Specialties in Mayerthorpe have been raising and marketing European wild boar since 1991. They raise 300 to 700 animals of varying ages on-site, with access to numerous other farm-raised animals from across Canada. This diversification has been key to the future of the Hagman operation. "Diversification has been critical to our success. The other part of our business is cattle and in the last two



Alternative meats such as elk are making their way into the mainstream, thanks to the introduction of "Rocky Mountain Cuisine".

years that piece of our business has been supported by the other (exotic meat) side," Deb Hagman says. "There was a time when it was the other way around."

There are several components to the Hagmans' business, including whole animal barbecues done on a stainless steel gas barbecue for private parties and sporting events, the marketing of certified breeding stock, as well as the sale of fresh and processed meat – everything from wild boar bacon, smokies, and jerky, to rack of wild boar, and terrine. "We add products at the request of our customers," says Hagman, noting that they have recently been nominated for the Alberta Chamber of Commerce Agrivalue Award.

Backed by Science

With the rise of alternative meat production, there is a corresponding increase in the need for research in this area. "Research is needed to understand the unique and marketable aspects of exotic meats," says Bill Buchta, General Manager of the Diversified Livestock Fund of Alberta. The DLFOA, along with other members of the Agriculture Funding Consortium, is helping to fill this gap.

"People are used to including red meats in their diet, so we need to find a way to fit our niche into this market," Buchta says. "It is a matter of capturing market share." He explains that research is required in many areas, including best production practices and genetics that support the kind of meat consumers demand. As well, information is

needed to determine the size of new and existing markets and how best to reach them. To ensure the end product meets consumer demand for quality, the industry requires research into storing, handling, and cutting meat to maximize its value.

The Agriculture Funding Consortium is already funding various projects to address these issues. One such study indicates that factors from health to curiosity may be the driving forces behind current consumer interest in alternative meats, both in Alberta and abroad.

Drs. Kevin Chen and Bodo Steiner at the University of Alberta are working to document consumer awareness, attitude, and choice for alternative meats in Canada. This information will be used to create a consumer profile to help develop a marketing strategy for the Alberta alternative livestock industry. The study will focus on alternative meats as a whole, as well as individual alternative meats such as ostrich and emu. "Information on the consumption of alternative meats is very limited in Canada," says Steiner. "To support the sustainable growth and development of a market-driven alternative livestock industry in Alberta, a better understanding of consumers' perceptions of alternative meats is crucial."

From emu, to tilapia, to elk, to wild boar, consumers have made it clear to Alberta producers that these days they are willing to go off the beaten path when choosing what's for dinner.

Credible Edibles

When it comes to their well-being, consumers want to see credible scientific claims regarding the health benefits some foods promise to deliver. New clinical trials on a patented oat and barley soluble fibre are on track to provide all of the evidence necessary.

Reading labels is becoming more and more the norm for consumers these days, as we are continuously warned of the perils of trans-fat, high cholesterol, and refined starches and sugars. We all want to know what we can do to better our health. Increasing the amount of soluble fibre in the diet has long been the push from several food manufacturers in the United States. The campaign there has been very successful, but in Canada there is much work to be done to get the message out.

Extracting and Converting

Drs. Thava Vasanthan and Feral Temelli are two University of Alberta researchers investigating the potential of beta glucan using the process of fractionation – a method of isolating the heart-healthy component of crops, including barley and oats,

from the rest of the grain. Vasanthan's research covers three areas: development of cost efficient technologies for beta glucan extraction from oats and barley; the use of beta glucan 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 glucan, while possibly improving the feed quality of the by-product.

In order for oat and barley beta glucan to be used more widely, viable methods of extracting it from whole grains must be developed. Vasanthan, in collaboration with Temelli, is applying new patented technology to the fractionation of oats and barley in order to separate the beta glucan. Once the beta glucan has been extracted, Vasanthan and Temelli are investigating using this oat

Did you know?

- Alberta produces more barley than any other province, about 6 million tonnes annually.
- Barley cereal is one of the first solid foods recommended for babies.
- Barley beta glucan is produced at a higher concentration than oat beta glucan, which is attractive to food and supplement manufacturers because less concentrate can be added to a product in order to achieve the recommended dosage.

Source: Alberta Barley Commission



and barley product as a dietary supplement and a food additive that will increase the fibre levels of low fibre foods.

Healthy Heart

Based on their work, Temelli and Vasanthan have formed a private enterprise named Cevena Bioproducts. Incorporated in April 2002, the new company is a science-based manufacturer of technically advanced grain-based ingredients for the functional food and dietary supplement industries. Cevena's proprietary process produces Viscofiber beta glucan concentrate, a soluble dietary fibre derived from natural whole oats and barley.

"Numerous scientific studies have demonstrated the positive effects of beta glucan on human health, especially cardiovascular health, weight control, glycemic response, and immunity," explains Kim Lucas, President of Cevena. "Cevena's mission is to improve human health and well-being through proven and effective nutritional products." To put the importance of cardiovascular health in perspective, Lucas says that, according to the American Heart Association, cardiovascular disease kills more people than the next 14 causes of death combined. "Coronary heart disease is a large subset of cardiovascular disease and the FDA recognized back in 1997 that beta glucan lowers cholesterol, which garnered their first-ever food-specific claim – beta glucan in oats could help reduce cholesterol. According to the American Heart Association, for every 1% reduction of cholesterol, there is a corresponding 3% reduction of the incidence of cardiovascular disease."

Substantiating Claims

This is no small health claim, and the implications of Viscofiber as a dietary supplement and as a heart-healthy additive in a variety of products, from nutritional bars to yogurt and juices, are enormous. Large-scale, expertly conducted clinical trials – one of the pieces of research required for a health claim – are underway to provide solid, scientific evidence of the cholesterol lowering effects of Viscofiber. Once documented, these claims will be presented to Health Canada, food processors, and ultimately consumers on the labels they read. "This process will make it accessible and affordable for consumers to lower their cholesterol and risk of heart disease," says Nicola Stevens, a Development Officer with Alberta Agriculture, Food and Rural Development. "It will give consumers the ability to take control of their health in an affordable, easy, and tasty way."

The cholesterol study involving Viscofiber is being conducted at the Universities of Calgary and Toronto. Dr. Ellen Burgess, head of the Hypertension Research Clinic at the University of Calgary, has been brought onboard as an investigator at the Calgary site. With over 25 years experience doing clinical trials, Burgess brings valuable expertise to the study.

Burgess has high hopes for the implications of the study, the data from which will be published in a peer-reviewed journal and submitted to regulatory boards in the United States and Canada. "The hope with the results of this study is that we will find a specific role for the beta glucan from oats and barley to lower serum cholesterol levels. This may open a new market for these specific products and for food products made with barley and oat beta glucan. In that way, it will help the farmers of Alberta," says Burgess.

Many studies have shown the positive health benefits of increasing the level of beta glucan in the diet. As a result, the Food and Drug Administration (FDA) 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 cholesterol levels. A petition for a similar health claim for barley is now also before the FDA and may be approved this year. Currently, in Canada, there are four registered health claims companies may use on their labels, none of which are product-specific. "It is hoped that the results of these trials will provide a strong foundation for a health claim," says Stevens.

"The hope with the results of this study is that we will find a specific role for the beta glucan from oats and barley to lower serum cholesterol levels."

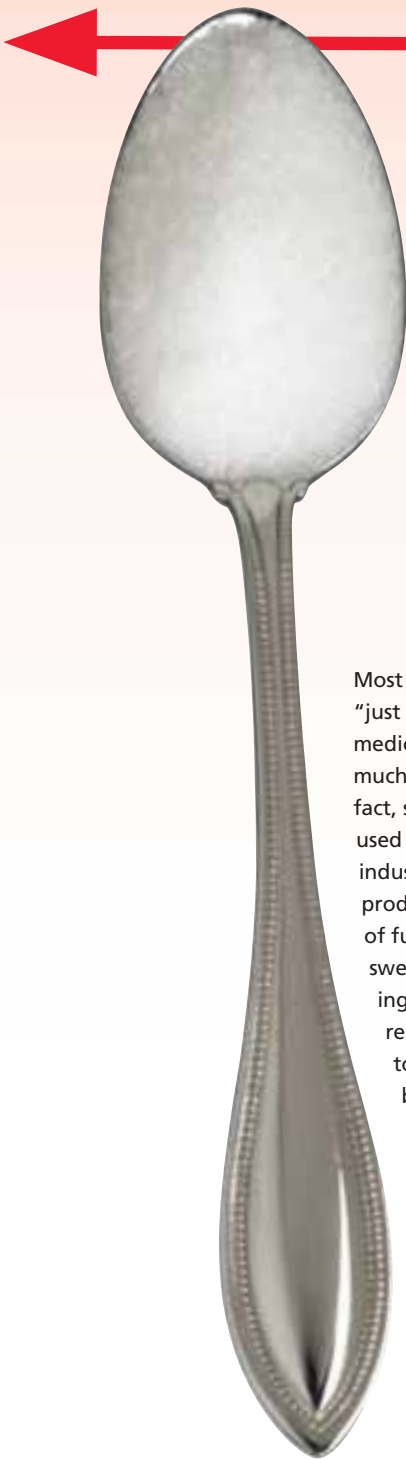
– Dr. Ellen Burgess

In addition to the benefits to the barley and oat industries and to consumers, the clinical trials are expected to help establish the University of Calgary as a credible location for such undertakings. It is hoped that this will pave the way for more trials to be conducted at the University in the future, allowing other made-in-Alberta research to be tested in the province, as well as attracting projects from outside the province for this phase of research.

The first phase of the trials characterizing the glycemic index of the Viscofiber concentrate is underway. Further research to determine how oat and barley beta glucan behave in various foods has also begun. Within two years, it is hoped that consumers will be able to read the labels on their favourite products at their local supermarket and identify which ones will help them snack their way to a healthier heart.

r&d

Just a Spoon Full of Sugar



Alberta is home to the only sugar beet processing plant in Canada. Researchers are discovering ways to reduce sugar loss in stored sugar beets, increasing the amount of extractable sugar to the benefit of producers, the processor, and consumers.

Most people are familiar with the lyrics “just a spoon full of sugar makes the medicine go down,” but sugar does much more than sweeten medicine. In fact, sugar, also known as sucrose, is used in many different products – from industrial uses to food uses. In food products, sugar performs a variety of functions in addition to providing sweetness and flavour. It’s an essential ingredient in baking, aiding chemical reactions and blending with butter to give height and lightness to baked goods. Sugar is a natural preservative in jams and jellies, preventing the growth of micro-organisms. It tenderizes meat and enhances the colour and texture of canned fruits and vegetables. Think about ice cream: without sugar, it would freeze so solid you couldn’t eat it.

Not many people realize the importance of sugar, but for southern Alberta, sugar production

from sugar beets is an important industry. Historically, sugar beet processing plants existed in Ontario, Quebec, Manitoba, and Alberta. Today however, the only remaining processor is Rogers Sugar in Taber, Alberta, which is capable of producing up to 150,000 tonnes of sugar a year, supplying sugar for the Canadian Prairies.

Harvest Time

Sugar beet roots are harvested in late September and October

and delivered to the Taber plant where they are stored outside for up to five months until processing. “Storing the harvested sugar beets outside until processing provides challenges in regards to maintaining both the quality of the beets and the sugar content,” says Jennifer Nitschelm, a research agronomist at Rogers Sugar. Sugar beets are a biennial plant, which means it takes two years for the plant to complete its vegetative cycle. However, the plant’s root is harvested during the first year for sugar production, and since the root is still living, it continues to use the sugar stored inside to survive. Producers and Rogers Sugar have taken the initiative to find ways of improving the storage of the beets, which will reduce the amount of sugar lost due to deterioration of the roots and respiration.

In order to minimize sugar losses during storage, standards are set for growers, explains Tom Machacek, sugar beet producer from Taber, Alberta. For harvesting, beets need to be kept cold for stability, but should not be frozen. Beets that have already frozen in the ground will thaw in the storage pile because fall climate conditions are not cold enough to maintain a frozen beet pile. “The quality of a thawed beet deteriorates more rapidly and they may not be able to be processed,” says Machacek.

Conversely, if the beets come into the piles too warm it takes longer for the piles to cool down and the beets continue to respire – reducing the sugar content, Nitschelm explains.

“Once a beet pile has been constructed, the ideal storage method is to thoroughly freeze the pile, but the best we can do given the climatic conditions in this area – strong winds, chinooks, and fluctuating temperatures – is to cool the beets quickly and maintain a consistent temperature in the piles,” she says. “Additionally, if the beet piles heat up during storage, sugar losses increase exponentially as beet pile temperature increases.”

Alternative methods for protecting stored piles have been



Sugar beets consume up to 560 mm (22 inches) of water during the growing season with seasonal water requirements depending on soil, climate, and weather conditions, as well as plant density, irrigation, and crop management (above left). Conveyor belts unload the beets from the trucks at Rogers Sugar. Sugar beet piles are 18 to 22 feet high, 200 feet wide, and up to half a mile long (above right).

evaluated in sugar beet processing areas of the United States, including forced air ventilation, splitting the piles, and covering the beets. Alberta's producers and Rogers Sugar wanted to know what would work best under their climatic conditions and be economically feasible for the processor, so with financial help from the Canada Alberta Sugar Beet Industry Development Fund, a three-year study was initiated.

Cooling for Sugar Content

Nitschelm and co-workers Peter Regitnig, Research Agronomist, and

Andrew Llewelyn-Jones, Agricultural Superintendent, compared beet pile temperatures and sugar losses over the storage period for both vented and non-vented beets. Culverts with underlying holes were placed at both 15 and 20 foot intervals under piles of stored sugar beets. Air drawn in from fans placed at the ends of the culverts moved cool air into the piles displacing the warm air, thereby keeping the beets cool, explains Nitschelm.

Their work showed some surprising findings that could benefit both producers and the processor. Ventilated beets,

regardless of whether the culverts were 15 or 20 feet apart, lost only 6% of the sugar sucrose over the storage period, whereas the non-vented beets lost an average of 28%. "By placing the culverts wider apart we were able to cool 33% more beets and extract the same amount of sugar," says Nitschelm. "This is especially important given the fact that it is very expensive to run the fans because of electricity costs."

Bruce Webster, General Manager of Alberta Sugar Beet Growers, says there are positive implications for both the processor and sugar beet growers because of this research. Producers are paid for the amount of extractable sugar. "If they can extract more sugar from the beets, producers get paid more," says Webster. "Additionally, it is more cost-efficient for the processor to extract more sugar from a given quantity of beets."

According to Machacek, the equipment costs for the study were \$500,000 but they were able to recover these costs during the first year because of the extra sugar produced. "This worked out to a return of 50 cents per tonne to the growers," says Machacek.

Rogers Sugar is conducting further research to reduce sugar losses in stored beets. Increased knowledge on reducing sugar loss will ensure the sugar industry in Alberta continues to enjoy economic success, and that Alberta sugar will continue to perform important functions in food products and non-food products alike.

Did you know?



- Sugar beets have been cultivated for thousands of years, but German scientist Andreus Marggraf did not discover their potential as a source of sugar until 1747.
- No artificial colours, flavours, or preservatives are used in the production of sugar.
- Sugar has some surprising non-food uses: it is used as an ingredient in printer ink, in leather tanning, and in the textile industry for sizing and finishing fabrics.

Capturing Opportunities



The Canadian beef industry is working collaboratively to identify and capture new marketing opportunities that will boost domestic beef consumption.

Home to almost 40% of Canada's cattle, Alberta has been hit hard by trade restrictions imposed after a cow was identified as having bovine spongiform encephalopathy (BSE). The resulting surplus of commercial beef products from older cows and bulls has had a significant impact on Alberta's beef producers. "The ban on the export of live cattle and meat from over thirty month (OTM) animals has greatly impacted cull cow prices and inventories. In 2002, only about 22% of our production from animals over thirty months was consumed here in Canada," explains Glenn Brand, Director of Marketing at the Beef Information Centre (BIC) in Calgary, Alberta.

"Prior to the border closing in May of 2003, when the first North American case of BSE was discovered, 40% of Canada's cull cows were exported live into the United States, our biggest importer, and 60% of Canada's processed meat from these mature animals also went into the United States," Brand says. With such a strong reliance on trade that is now severely restricted, Canada's beef industry needs to find new ways in which this additional supply can be used. That is where the Commercial Beef Utilization Strategy comes in.

Members of the Agriculture Funding Consortium funding this project include:

- Agriculture and Food Council of Alberta – CARD Program
- Alberta Livestock Industry Development Fund

The Commercial Beef Utilization Strategy is a national program designed to deal with the significant increase in cow inventories and the declining value of these animals. "Since the BSE crisis, the value of cull cows has declined more than any other class of cattle," says Brand. Finding innovative ways to add value to products from these animals can make a real difference to cow/calf producers' bottom lines.

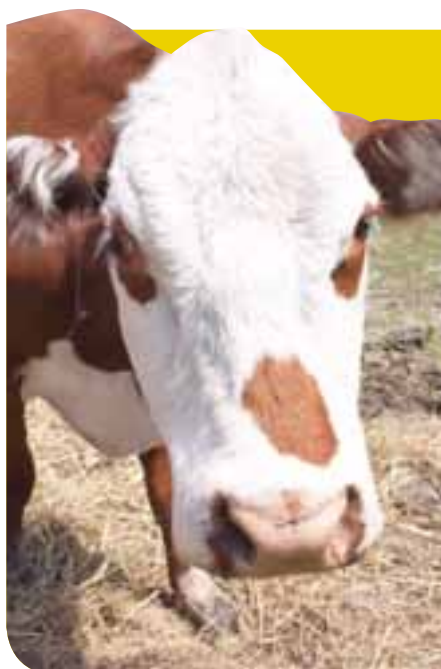
Implemented by BIC, a division of the Canadian Cattlemen's Association (CCA), the Strategy is aimed at:

- increasing our market share versus import beef in Canada,
- expanding the size of the domestic commercial beef market, and
- adding value to commercial beef products through product development.

To help achieve these goals, nine Canadian Adaptation and Rural Development (CARD) Councils from across the country pooled their resources, which are provided by Agriculture and Agri-Food Canada, and contributed approximately \$2.5 million towards the project. In addition, the initiative has also received support from the National Beef Industry Development Fund and Alberta Beef Producers.

"For its part, BIC is working in close collaboration with federal and provincial governments to increase domestic demand as additional packing plant capacity is coming on line," says Brand. "We are working with the manufacturing, foodservice, and retail sectors to increase their use of Canadian beef and to enhance its value through new product development," he adds.

The key to expanding and opening up these markets is knowing your product. That's why BIC has initiated research into characterizing meat quality and composition of meat from mature animals, in both fresh cuts and processed production. "Since not all portions or grades of cows may be suited for cut production, research is also being carried out to examine the potential of including meat from mature cattle in ground beef and further processed



Did you know?

- The beef industry contributes about \$4 billion annually to Alberta's economy.
- 66% of Canadian cattle are processed in Alberta.
- Canada's cattle population is currently estimated to be 15 million head.
- Ground beef accounts for approximately 50% of Canadian beef sales.
- Canadians ate approximately 23.4 kg of beef per capita in 2003, an increase of 5% from 2002.

products," explains Mark Klassen, Food Safety and Quality Manager at BIC.

Quality Research

Thinking of having hamburgers or spaghetti and meat balls for supper, but not sure what type of ground beef to use? As it turns out, ground beef is not all the same. "Some ground beef is made up of many different cuts or trim portions mixed together, while some ground beef is made from one specific cut or source of beef, usually chuck, sirloin, or round," explains Klassen. "However, the eating and processing qualities of beef made from trim and source grinds from OTM cattle has not been fully explored, nor is it known how these products compare to grinds made from younger cattle."

Backed by funding from the Beef Utilization Fund and the Alberta Livestock Industry Development Fund, researcher Kathleen Bunnin with Alberta Agriculture, Food and Rural Development, along with other researchers at the Leduc Processing Development Centre, are conducting several projects to provide answers to these questions.

Part of this project involves looking at the substitutability of trim from Canadian OTM cattle versus imported beef. "Currently,

some Canadian processors use imported beef in a variety of products, from fabricated hamburger patties used in fast food restaurants to deli meats for the retail meat counter," explains Brand. "But by knowing the eating characteristics and consumer acceptance of meat patties and burgers made from the different grades of cows classified according to Canada's grading system, we can determine where processors are best suited to use these products," adds Klassen.

Although most of the research is at an early stage, the Commercial Beef Utilization Strategy has already had a positive impact on Canada's cattle industry. "The domestic market for commercial beef is about 179,000 tonnes and in 2002, 26% of this market was Canadian beef. In 2004 it had risen to 65%," says Brand. "Additionally, Canadian beef now accounts for about 90% of the beef consumed here, up substantially from 67% three years ago."

As research results become available, BIC will deliver this essential information into the hands of those who can put the knowledge to use – food manufacturers, packers, retailers, and foodservice providers. It is information that will identify opportunities for increasing market access and real returns for Canada's cattle producers and, at the same time, continue to provide consumers with the high-quality products they are accustomed to. r&d

Thinking about having Canadian beef for dinner?

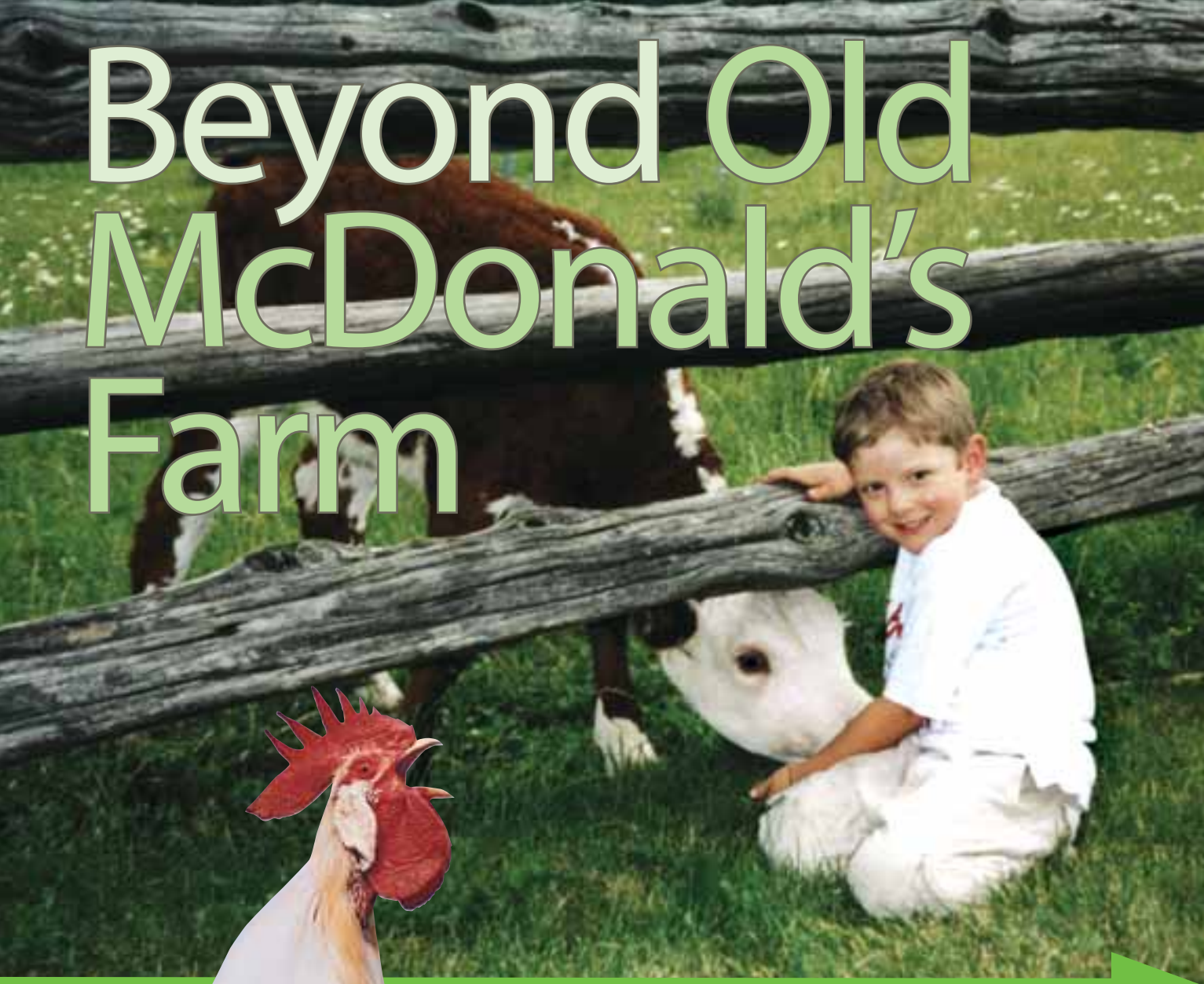
For great recipes visit www.beefinfo.org/recipe.cfm

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Beyond Old McDonald's Farm



Today, most Alberta children grow up in cities rather than on farms, disconnected from the way their food is produced – but that doesn't mean they're clueless about the importance of agriculture to their lives.

Two children were overheard in a school lunch room discussing their milk. "Where does it come from?" one child asked. The other replied, "a cow of course." The interrogator continued, "Okay, but then where does *chocolate* milk come from?" "Well, duh," said the other child, "it comes from *brown* cows." Stories like this have made their way around school classrooms, office water coolers, and e-mail groups. But how accurate is this portrayal – are kids today so disconnected from food production they believe some cows produce white milk while others produce chocolate? *Reach & Discover* set out to determine what children really think and know about agriculture.

It turns out that most children we talked to know that cows do not directly produce chocolate milk, and that food is produced on farms rather than in supermarkets. For the large part, the group of six to nine-year-olds we talked to also knew that without a strong farming community, our food supply would be dramatically reduced. But unlike previous generations that were so connected to their family farms and to the process of food production, today's children do not seem to grasp the concept of agriculture as a means of earning a livelihood or as a business. This is not surprising, given that more than half the children we talked to have never been on a farm.

The city kids, in particular, seemed to feel having animals was actually a prerequisite to farming.



What Happens on a Farm?

Perhaps thanks to the familiar childhood song "Old McDonald had a farm", the children were all familiar with the concept of a farm, and they all were certain "on that farm he had some animals". The city kids, in particular, seemed to feel having animals was actually a prerequisite to farming. While some acknowledged that various crops might be grown on a farm, they really thought this was at best a secondary purpose of farming. When asked to define farming, six-year old Hayley of Canmore, Alberta answered without hesitation that it was taking care of animals – a definition that was echoed by several of her peers. In fact, this group of kids was almost unanimous in declaring that the best thing about living on a farm would be playing with and taking care of the animals, which they clearly see as pets

rather than livestock. Judy Kesanko from Stony Plain, Alberta is a key organizer of City Slickers, a program to bring urban children to a farm setting. She reports that many of the Edmonton school children who come out to see a working farm ask farmers the names of their animals. One young Calgarian felt that a farmer's role in livestock production was to protect endangered animals. The scale of agricultural production today eludes these children.

Who Works in Agriculture?

The children we spoke to all knew that farmers worked in agriculture, but when asked what other jobs there might be in the industry they were stumped. So we asked whether they thought scientists, business people, or university professors might have a role in agriculture – the majority of kids

thought not. Seven-year old Gunnar of Calgary felt that scientists might work in farming to clone animals, but a nine-year old rural Albertan thought the idea of scientists being involved in the industry was downright funny. As for the business community, the majority of kids did not think it had a place in agriculture at all.

Although the kids felt that jobs in agriculture were closer to that of Old McDonald's than a scientist's, they did concede that you do not have to live on a farm to work in agriculture. All the children recognized that a farm requires a lot of space and several kids pointed out that a farmer could live in the city and commute to his/her farm each day.

How Does Agriculture Affect Your Life?

When asked "What if there was no farming?" Julia from Canmore, Alberta, with the characteristic frankness of a six-year-old, told us that "without farming, we would have to grow food ourselves." In fact, almost all of the children answered there would be little or no food without farming. One little boy even pointed out that a lack of farms would be a problem because his family's backyard was not big enough to grow all of their food. These Albertan kids know that agriculture is essential to their lives, even without understanding the roles of science, research, finance, transportation or trade in food production and distribution.

So what does this mean to future career plans? Does the idea of participating in producing the nation's food supply appeal to any of these young folks? Only one had a burning enthusiasm for the industry. Sammy, a nine-year-old farm-boy from Woking, Alberta, works alongside his dad whenever he can and wholeheartedly plans to continue on in the family business. But it is not the animal care that is drawing him to the industry, as his peers' responses would suggest. Rather, it is the community of agriculture that Sammy loves. Sammy thinks that the best things about agriculture and farm-life are meeting people and spending a lot of time with his dad. He thinks the machinery is pretty cool too, but more than anything, he feels that farming is not just about feeding people or making money, but about the way they live.

Horsin' Around and More

Members of Alberta's Agriculture Funding Consortium understand the importance educating our youth about agriculture. Here are just a few of the initiatives the members of the Funding Consortium support to help get the message out and to encourage kids to get involved in agriculture.

The Pig Science Centre – An initiative of Alberta Pork, the Centre allows kids in kindergarten to grade six to see first-hand how pigs are cared for, what they eat, how they are housed, and what is done with the manure they produce.

Farm Animal Welfare Education – Alberta Farm Animal Care's curriculum-based program for elementary and high school students that provides students with balanced, timely information about farm animal welfare with an emphasis on animal behaviour, management practices, and ethical values.

Parkland Conservation Farm – Summer day camp programs are offered for kids aged 3 to 16 with special themes relating to agriculture and the environment. For example, at the Horsin' Around day camp, kids can interact with different farm animals and learn about their various uses.

Agriculture in the Classroom – A program that builds awareness and understanding of sustainable agriculture and food systems by providing educational programs and resources to students and teachers. In Alberta, more than 800 schools participate in the agriculture ambassador program, a marketing and distribution link with practicing teachers.

Classroom Ag Program – A grassroots initiative where volunteers from the agriculture industry come into grade three and four classrooms to speak about their experiences. The program provides an opportunity for the industry to share with kids the importance of agriculture in Alberta.

Growing Alberta – This comprehensive communications and public relations program builds understanding and awareness with Albertans on the agriculture and food industry. Its web site provides many valuable resources and links for kids, parents, and teachers to aid in learning about agriculture and food.

A Roadmap to Water Protection

Soil-landscapes are providing agriculture with roadmaps to ensure groundwater is a protected resource.

Water, water everywhere, but not a drop to drink. We would be in a lot of trouble if this were true and we didn't have safe, clean water to drink. Water is essential to every bodily function for animals and humans. Most Albertans, including those living in small towns, rely heavily on underground water sources for household, agricultural, and livestock use. The reliance on these invisible water sources will likely increase as more and more people move into the rural areas and Alberta continues to grow – which is why soil scientists are building a roadmap to protect groundwater by mapping out the areas that need careful management.

Once precipitation – rain, snow, hail, or irrigation water – reaches the earth, it infiltrates the soil, evaporates, or moves across the land emptying into rivers, lakes, and oceans. Both soil properties (physical, chemical, and biological) and landscape properties (topography, surface water, and vegetation), within an area of a field, influence nutrient utilization by crops and whether water infiltrates the soil or flows over the land to surface bodies of water. Water that infiltrates the soil may be stored, utilized by plants, or move downward below the water table to groundwater – water that fills in the spaces between particles of soil, sand, gravel, and rock. These geological materials form what is called the groundwater aquifer. In Alberta, most wells are supplied by deep aquifers trapped below shale, rock, or clay. These important sources of water must be kept pristine and safe.

The agriculture industry is working hard to make sure neither fertilizer nor crop protection products affect the water supply. Predicting where contaminants could enter groundwater aquifers is the first step to developing beneficial management practices, which will protect this resource for future generations.

Members of the Agriculture Funding Consortium funding this project include:

- Alberta Livestock Industry Development Fund
- Alberta Agricultural Research Institute
- Alberta Crop Industry Development Fund

The agriculture industry is working hard to make sure neither fertilizer nor crop protection products affect the water supply.

Agricultural land varies in both landscape and soil properties.



This challenge of predicting where water moves into groundwater prompted the Alberta Livestock Industry Development Fund, the Alberta Agricultural Research Institute, and the Alberta Crop Industry Development Fund to fund a study at the University of Alberta (U of A). The study's mandate is to determine if soil-landscape information can be used to indicate where the downward movement of water and agricultural inputs (called leaching potential) is most likely to occur in agricultural fields so that field management plans can be developed to prevent groundwater contamination.

Reading Soils

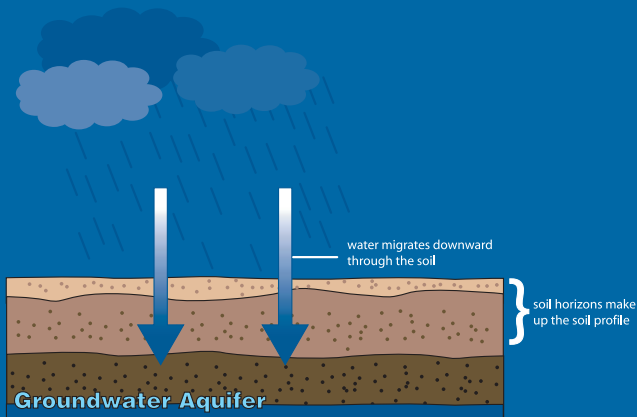
Les Fuller of Axys Environmental Consulting Ltd., David Chanasyk, lead researcher and professor at the U of A, and graduate student Josée Thibodeau have been working on this research for the past two years. "Soils record for us where the water has been and is currently moving down through the soil profiles. If we learn to interpret the soil's information correctly we can determine the points in a field or landscape where leaching is most likely to occur," explains Chanasyk. "Once we know which areas are more susceptible to leaching then we can manage those areas differently to ensure that inputs applied in those areas don't find their way into groundwater," he adds.

Like everyone on a journey, these researchers used a guide to ensure they reached their goal. The guide in this instance was a concentration of sulphate, a natural tracer. The researchers measured the amount of sulphate in soil samples taken from depths of three to four metres at various places in a field: depressions, slopes, and knolls. The concentration of sulphate as a function of soil depth is called a solute profile. "Solute profiles that exhibit low concentrations of sulphate indicate that removal of sulphate from the soil has occurred by leaching in these areas over time," explains Fuller. "Conversely, solute profiles that exhibit an accumulation of sulphate indicate that leaching has not occurred in that area of a field."

According to Fuller, solute profiles are expensive and time-consuming, which hinders their use for determining where leaching may occur within a field. So to find a less expensive way of determining where water migrates downward within a field, the researchers compared the different solute profiles and found some interesting results. Solute profiles that show accumulation of sulphate in the soil (indicative of a low leaching potential) correspond to a particular type of soil profile – one that is less likely to leach, explains Fuller. These soils have profiles that don't contain a lot of different horizons. In areas of a field where there is a high leaching potential, the soil profile will show several different horizons or layers that show evidence of downward migration of water through the soil.

Key Soil Terms

Soil Horizon	a layer of soil lying approximately parallel to the earth's surface.
Soil Profile	the vertical display of different soil layers or horizons.
Solute Profile	the concentration of sulphate or chloride as a function of soil depth.
Leaching	removal of soluble materials by water passing through soil.



"Areas of a field that are considered to be 'sensitive' are either more prone to leaching or runoff," explains Fuller. These sensitive areas need to be managed differently than the rest of the field to lessen the amount of nutrients or agricultural chemicals that may migrate downward into groundwater. "There may be only three or four of these sensitive areas in a field, only 20 to 50 metres in diameter," says Fuller. "Farmers would need to tailor input application rates to these areas in order to protect water sources. This may mean lowering the application rate in these sensitive areas." Not only does this minimize agricultural input losses to the environment, it protects the quality of surface and groundwater and may help farmers save input costs.

There are benefits to motivate everyone when it comes to protecting groundwater quality, something that affects us all. Like a good roadmap, soil profiling helps farmers reach their destination of sustaining both the quality of water and agriculture. **r&d**

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Berry Good For You

New modified-atmosphere packaging for saskatoon berries may be just the thing to help this tasty, healthy, native Prairie crop hold its own on fresh fruit markets both at home and abroad.

Saskatoon berries were originally used as a major food source by aboriginals and early settlers of the North American Prairies and, until recently, could only be picked in the wild. Over the past two decades, however, there has been increasing interest in utilizing the cultivated production of this tasty berry as a unique Western Canadian fruit crop. Today, there are 100 to 200 hectares of cultivated saskatoons in production on the Canadian Prairies. Another 200 to 400 hectares have been planted, but are still too young to produce significant quantities. Consumers are attracted to the unique, subtle flavour of a “wild” fruit product made from saskatoon berries, and preliminary market studies indicate the potential for acceptance of saskatoon berry products is worldwide.

A shortage of fresh saskatoon markets, however, is the biggest limiting factor for further growth in the industry, explains researcher Dr. Wendy Wismer, Assistant Professor at the University of Alberta, Department of Agricultural, Food, and Nutritional Sciences. Currently, most saskatoon berries end up processed into jams or pie filling. While the demand for the berries in their processed form may be great, there is significant clamour for the fresh form. This is not surprising considering both taste and nutritional value are at their highest immediately following harvest. “To date, saskatoons are not sold in large supermarkets as fresh fruit because flavour and quality of the fruit degrades rapidly within days of being picked,” she says.

Wismer and Dr. Jocelyn Ozga, also at the University of Alberta, are conducting a three-year study to evaluate the sensory attributes of saskatoon berries and the consumer response to these attributes over time and under different types of packaging. Wismer is working to identify the major flavour and texture components of the berries and performing consumer evaluations, while Ozga is responsible for the development



Members of the Agriculture Funding Consortium funding this project include:

- Alberta Crop Industry Development Fund
- AVAC Ltd.
- Alberta Agricultural Research Institute



Did you know?

Anthocyanins are naturally occurring compounds that impart colour to fruits, vegetables, and plants. Derived from two Greek words meaning **plant** and **blue**, anthocyanins are the pigments that make blueberries

blue, raspberries **red**, and are thought to play a major role in the high antioxidant activity levels observed in red and blue fruits and vegetables.

Widely distributed among flowers, fruits, and vegetables, anthocyanins belong to a group of plant compounds called flavonoids. Flavonoids are a subclass of plant polyphenols that may have antioxidant abilities and are being studied for their anti-cancer potential. Currently under investigation for their ability to inhibit LDL (the "bad") cholesterol, prevent blood clotting, and defend cells against dangerous carcinogens, anthocyanins may prove to be significant compounds in human health.

of modified-atmosphere packaging (MAP) for fresh berries and determining their nutraceutical potential.

It is hoped the results of their work will open up both domestic and overseas marketing opportunities for Alberta producers and their fresh saskatoons. "A product suitable for export would allow Alberta saskatoon producers to compete for consumer dollars on a global scale," says Wismer. "Fresh blueberries retail for approximately 45% more than frozen blueberries, thus if the price of fresh saskatoon berries is affected proportionally and berry production keeps increasing like it has been since 1999, this would significantly increase the value of the Alberta saskatoon crop."

While the research is good news for producers, consumers will also benefit by having a tasty choice to increase their fresh fruit consumption and meet nutritional guidelines. Besides tasting good, saskatoons contain higher levels of protein, fat, and fibre than most other fruit and studies indicate they might be a useful source of vitamin C. Saskatoons are also known for their antioxidant qualities – another health profile the researchers are trying to establish. Ozga is quantifying and profiling the level of anthocyanins, the antioxidant that gives the fruit its deep purple-red colour, present in saskatoons. "We want to identify the major anthocyanins present at fruit maturity in order to determine the nutraceutical potential of saskatoons," says Ozga. "Antioxidants protect cells from damaging free radicals and from stress in general. They've been implicated to aid in heart disease and cancer prevention, so we're looking at the level of antioxidants that are in saskatoons and comparing that quantity to other fruits."

Good Pickings

Gerry Tobert owns and operates a six-acre saskatoon berry farm, Treeberry Farm, in Spruce Grove, Alberta. What initially started as an early retirement project is now a growing business. About half of the 12,000 pounds of berries produced seasonally are marketed through his u-pick while the other half are processed into jams, jellies, chutneys, vinaigrettes, and pies. The Toberts also sell boxes of pre-picked berries at four local farmers' markets. "In this day and age, we see a trend towards convenience," says Tobert. "People want the end-products since they no longer have time to pick, process, or bake the berries themselves."

Treeberry is one of two farms supplying Wismer and Ozga with berries for their research. "Their study has been helpful to us by identifying the berry varieties consumers find the most pleasing," says Tobert. "We are also hopeful that this work might lead to nutraceutical discoveries that will increase our value-added markets."

For the Taste

Wismer says that just like grapes, saskatoon berries can vary in taste depending on the variety grown. Her role in the project is to create a quality profile of post-harvest flavour development in the major cultivars of saskatoons, in order to have a reference for evaluating the effects of the packaging treatments on berry flavour in future years. "We've put together a trained panel to evaluate the sensory characteristics of five different cultivars to develop a profile of the dominant aromas, flavours, and textures of fresh berries," she says. The panel, explains Wismer, uses terms like musty, earthy, grassy, and sweet to distinguish one berry from the next, just like a sommelier describing a bottle of wine.

This summer, using the data collected in Wismer's study, Ozga will develop post-harvest packaging that will ensure the flavours and textures identified by Wismer's test group are retained from field to fork. Ozga's modified-atmosphere packaging encloses the fruit in plastic films that are made out of a specific type of polymer. The amount of oxygen available to the fruit is greatly restricted so the respiration rate of the fruit slows down, which decreases the rate of breakdown of flavour, sugars, and acids, increasing the longevity of the fruit. "The idea is to keep the fruit in a condition as close as it can be to when it's picked off the tree, to help maintain the quality parameters," explains Ozga. She adds that with the modified packaging they are looking at keeping the fruit fresh for a period of up to three weeks.

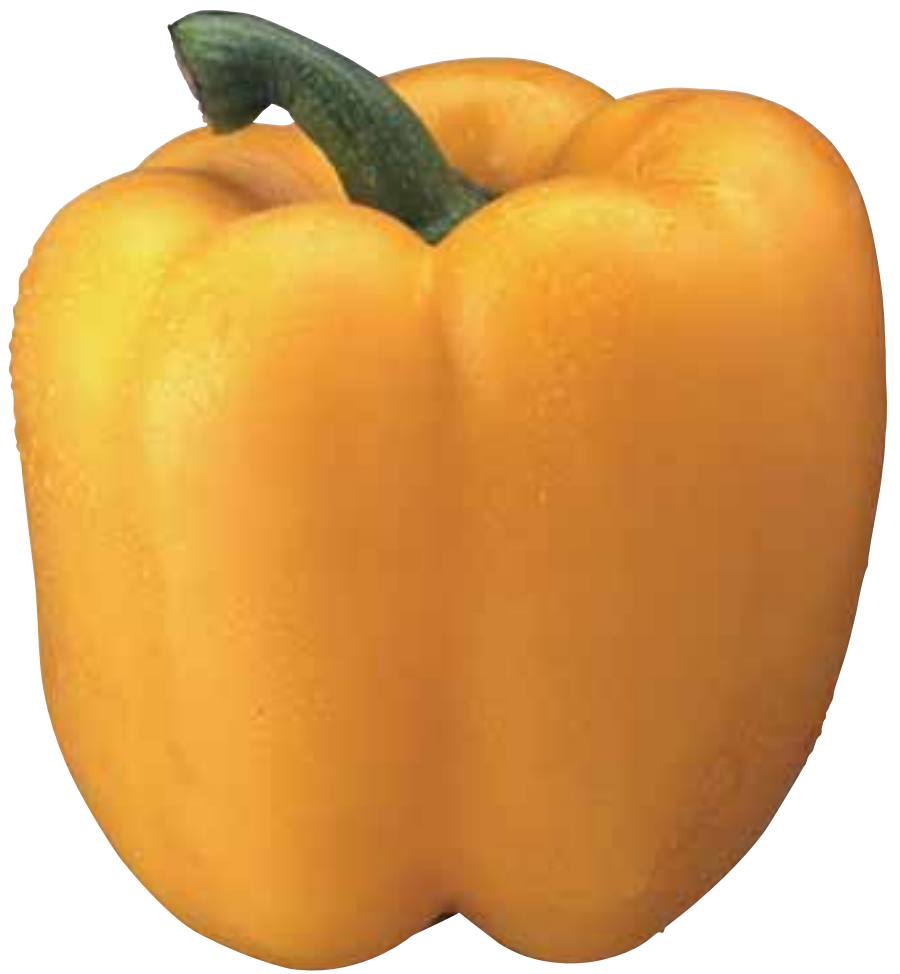
Following development of the post-harvest packaging, a panel of 80 consumers will identify their most preferred cultivar of fresh saskatoons, allowing the researchers to measure consumer responses to the changes that happen to the berries in storage. The cultivars that demonstrate the best storage and quality characteristics will be used for packaging work in the third and final year of the study.

"We have significant interest from Asia in our berries, but in order for producers to make use of this market, they need to ensure their berries are going to stay fresh and acceptable," says Wismer. Wismer, Ozga, and growers like Tobert are hopeful that modified packaging will open a big window of opportunity for fresh berries, stimulating a burgeoning horticultural industry and exposing even more consumers to the pleasures and health benefits of the saskatoon. **r&d**

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Fighting Fusarium in the Greenhouse



Fusarium is a nasty fungus that attacks all kinds of crops from wheat and barley to peppers. A new strain of the fungus, *Fusarium proliferatum*, infects peppers on the inside, usually without any outward symptoms, making it particularly difficult to control.

Sweet peppers are a great addition to many dishes, from stir-fries to salads and sandwiches. But all is not sweet on the pepper front: there's a new fungus that's leaving a sour taste in the mouths of producers as they watch their pepper yields decrease.

This fungus affects pepper producers in many regions, including British Columbia and Ontario, but research is underway to address the problem. Thanks to funding from members of the Agriculture Funding Consortium, researchers in Alberta are hard at work figuring out how to put the sweetness back into pepper production.

Looks Can Be Deceiving

The problem with this new fungus, *Fusarium proliferatum*, is that it is not generally visible from the outside and if it does become visible it is not until much later when the fruit is fully ripened. In 2002, this fungus started showing up in Alberta greenhouses, but was not visible to producers until the pepper was cut open. "Because you can't see any symptoms from the outside, how could you tell which ones to throw out?" asks Dr. Prem Kharbanda, a Senior Research Scientist at the Alberta Research Council and a lead on this project. "This could become an industry-wide problem which could potentially shut down the industry."

The loss would be substantial because peppers are a high value crop. There are only 10 acres of pepper production in Alberta's greenhouses, but the crop grosses \$4.2 million annually. With a yield loss of four kilograms per square-metre, greenhouse producers

would lose about \$170,000 a year.

Not being able to see the disease presents a huge problem for producers. "Consider yourself a pepper producer," says Doug Walkey, Executive Director of the Alberta Crop Industry Development Fund, which helped fund this research. "You're producing a product that shows no outward signs of damage, and needs to get to market in a timely manner, but could possibly have a fungus inside. What do you do? Do you cull everything you think might have a problem?"

Figuring Out the Fungus

Fortunately there is a team of researchers working to figure out how this fungus works. This team includes Kharbanda, Dr. Ron Howard with Alberta Agriculture, Food and Rural Development (AAFRD) at the Crop Development Centre (CDC) South, and Dr. Mohyuddin Mirza, a Greenhouse Industry Development Specialist with AAFRD at CDC North. They've already completed a major step: identifying the type of fungus. "We have been able to reproduce the symptoms of the disease by spraying the (pepper) flowers with the suspect fungus. Replicating the disease assures that we have identified the correct fungus," says Mirza.

There are two other types of fusarium that affect peppers: one attacks the stem and kills the plant, while the other attacks at the neck where the fruit is attached to the stem. By determining it's a new strain of fusarium infiltrating the pepper, the researchers can now work on controlling the disease.

Another part of the study included conducting an extensive survey to discover the extent of the problem. The results

"It's a blessing we got some resources to study this problem. It helps us to be proactive and able to solve the problem before it becomes more widespread."

– Dr. Mohyuddin Mirza

show this fungus primarily attacks orange peppers, with the Sympathy variety being the most susceptible. The survey also found, of the participating greenhouses, the infection rate ranged from 1 to 10%.

The main objectives of this study, according to Kharbanda, are to find out how the fungus gets into the peppers; if there are any orange pepper varieties that are more resistant to this disease; and whether the fungus can be controlled with fungicides, or if there are biocontrols that can combat the fungus. Kharbanda knows of one biocontrol, a bacterium that controls several diseases on both greenhouse and field crops, that may work on *F. proliferatum*. "This particular bacterium we know controls fusariums so we want to use it on this crop at the flower stage and see if it has an affect against this fusarium," says Kharbanda.

Mirza suspects the fungus may be coming into Alberta from imported seedlings, but more research needs to be done. "In the preliminary research we determined the flowers (which later develop into the fruit) are getting the fusarium in them very early, even before pollination," says Mirza. "Demonstrating that early set flowers are already infected will help to trace the source of the fungus. What we want to know is if it is coming from the air or a source outside the greenhouse, and how it is spread in the greenhouse."


Knowledge Transfer


An important part of this project is getting knowledge out to growers. "It's important that we make growers aware of what they can do to help protect against this fungus," says Mirza. To that end, a brochure has been produced and sent out to growers both in Alberta and British Columbia.


Several recommendations have already come out of this research and are included in the brochure. "We recommend that when you remove the old crop, you are very thorough with the sanitation of the greenhouse," says Mirza. "Sometimes fusarium spores hang on the nooks and corners of the greenhouse, so growers have to disinfect the greenhouse thoroughly and change over the plastic. We are focusing on sanitation quite a bit – it's the number one strategy." Other strategies Mirza recommends include:

- keeping the humidity in the greenhouse at or below 85%;
- being careful when removing the fruit so not to unnecessarily injure it;

Did you know?

 Sweet peppers, also known as bell peppers, are an excellent source of vitamin C, having twice the amount by weight than citrus fruits.

 The variety of a sweet pepper and the stage of its ripeness determine the flavour and colour. Red peppers are simply a mature green pepper.

 Red peppers contain 11 times more beta carotene than green peppers.



- because some spores hang on the leaves, lowering the relative humidity immediately after removing the leaves to prevent spores from finding another place to hang on to.

This education campaign has already shown results. "Last year some of the growers maintained a very active climate – that means the plants were kept very healthy – and in 2004 the disease incidence was less than in 2002," says Mirza.

Mirza says keeping growers alert about the disease is a proactive way of dealing with this problem. He says the funding, from both industry and the members of the Funding Consortium, is very important in keeping Alberta's greenhouse pepper industry healthy. "It's a blessing we got some resources to study this problem. It helps us to be proactive and able to solve the problem before it becomes more widespread." By fighting fusarium in the greenhouse, consumers and producers alike can be sure the sweet stays in sweet peppers. **r&d**

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Waste Not Want Not

Some people consider manure to be waste. Others consider it to be just a plain nuisance, not only because of its smell, but also because of environmental concerns. But for Highmark Renewables, manure is a valuable resource used to generate “green” electricity and organic fertilizer while offsetting greenhouse gas emissions.

Reducing manure by 40% of its volume and making it a valuable energy resource is a great way to avoid waste and want. In Vegreville, Alberta, Highland Feeders has constructed a demonstration plant on its feedlot that is leading the way in converting manure into an asset. The innovative plant, known as the Integrated Manure Utilization System (IMUS), puts this by-product to better use by producing green electricity, heat, and organic fertilizer. And although the bacteria used in the process may not leave manure smelling like roses, it now smells like the soil used to plant them in.

Every day, large amounts of manure are deposited by farm animals across Alberta. The conventional approach for managing manure is to apply it as a fertilizer, adding organic matter which

stores and supplies essential nutrients for crop growth and reduces the need for commercial fertilizers. However, the storing and handling of the large amounts of manure, especially from intensive livestock operations, has raised public concerns in regards to greenhouse gas (GHG) emissions and manure’s effects on surface and groundwater quality.

Managing Public Concerns

All livestock operations, no matter how large or small, generate some odour, but Alberta livestock producers are working hard to abate odour and maintain good neighbourly relations by following Alberta’s Agricultural Operation Practices Act (AOPA). The AOPA provides standards for environmental management in the livestock industry and

specifies the minimum distance that must separate new or expanding intensive livestock operations from their neighbours. To disperse or reduce odours some producers are also planting trees, covering their manure storage facilities, using manure additives, composting the manure prior to spreading, and injecting or incorporating the manure into the soil.

Additionally, livestock producers follow their own nutrient management plans which dictate where and how much manure can be applied to the land. This helps to ensure the rate of manure application does not exceed crop nutrient uptake, thereby reducing the impacts of manure on surface and groundwater quality. Still, storing and spreading manure releases GHGs – carbon dioxide, methane, and nitrous oxide – into the atmosphere, contributing to global warming.

The agriculture sector is responsible for approximately 10% of Canada's GHG emissions; however, new technologies and manure management practices are expected to lead to significant reductions in the overall output of these gases, in turn reducing agriculture's contribution to the problem. One practice capturing attention is biogas production, whereby the manure is converted into a renewable energy source. In Alberta, a demonstration biogas-power pilot project, the IMUS, is currently being conducted under the federal Greenhouse Gas Mitigation Program and is generating excitement as well as electricity.

The \$7.9 million project funded by industry and provincial and federal stakeholders is believed to be the first biogas-powered generating plant in North America that uses solid manure. The system uses manure to produce electricity, as well as heat, bio-based fertilizer, and reusable water. The technology, developed by the Alberta Research Council (ARC) and Highmark Renewables, a wholly-owned subsidiary of Highland Feeders Limited, helps resolve the issues associated with managing the large amounts of solid manure produced by cattle at outdoor feedlots.

Waste Not

Turning manure into green energy is a relatively simple process that begins with chopping it to increase the surface area for the bacteria. The manure is then fed into a concrete tank or digester, where it is heated in the absence of air, to produce methane.

The heat causes any potential disease-causing pathogens contained in the manure to be destroyed. Dr. Xiaomei Li with the Alberta Research Council and lead research scientist on the project explains: "It is a semi-continuously fed system where the manure can be added daily." In the digesters, bacteria break down the organic matter in the manure into methane, carbon dioxide, and water.

The methane is fed into a co-generation system, where it powers a reciprocating one mega watt engine (similar to a car engine) to produce electricity. The remaining muck is fed into a centrifuge to separate the solids and liquids. Lime is added to the liquid component to remove ammonia before the excess water can be recycled back into the IMUS, or used for irrigation purposes or dust suppression. The manure takes approximately 14 days to work its way through the system. "Once the manure goes through the IMUS it smells like potting soil," says Mike Kotelko, Highland Feeders owner, adding, "There's a 40% reduction in the volume of manure."

According to Li, "The reduced manure volume could reduce the land base requirements for livestock producers and eliminate odour. This could lead to a reduction in the minimum land separation requirements between intensive livestock operations and other rural residents."

"The IMUS project demonstrates how technology and innovation can be used to grow industries that historically have suffered poor public perception and

generate their acceptance through improved environmental sustainability," says Paul Hunt, Vice-President of Climate Change Central. In addition to mitigating many of the social and environmental concerns with manure, the technology may generate revenue for livestock producers which can serve to reduce the operating and capital costs associated with the technology.

Want Not

The IMUS pilot plant processes manure from 7,500 head of cattle, producing close to one megawatt (one million watts) of electricity, more than enough to satisfy the electrical needs of the feedlot, with surplus power being sold to the grid. The plant will eventually be expanded to produce three megawatts of electricity. "The system allows us to produce a sustainable form of energy right outside our door which could replace fossil fuel use," explains Kotelko. It is hoped that eventually a commercial IMUS can be developed to handle the manure from a feedlot containing a minimum of 20,000 head. According to the Canadian Cattlemen's Association, a system of that scale would annually produce 14,480 megawatts of electricity and 13,000 metric tonnes of organic fertilizer, potentially worth approximately \$1 million and \$660,000 respectively.

Additional value-added revenue could be garnered from the system once national carbon credit systems are developed. Credits can be sold to GHG-emitting firms who have regulatory obligations on the amount of emissions they are allowed. "These companies can either make emission reductions themselves or pay another organization to make the reductions for them," explains Hunt. "It doesn't really matter who or where the reductions are taking place in the world, as long as they occur."

Although the costs to implement the technology are presently high, researchers are working on ways to make the equipment more affordable. Additionally, there are opportunities for producers living in the same geographic location to pool resources and look for ways of sharing the costs and returns from a joint venture.

Creating ways to make biogas systems affordable for small or large livestock producers alike will be the next step forward, since 40% is a significant reduction of manure. Given Alberta's scientific excellence and the determination of its livestock producers and industry partners, this too will be achieved.

IMUS generates electricity and organic fertilizer from manure.



Construction of the co-generation system which turns biogas into electricity and heat.

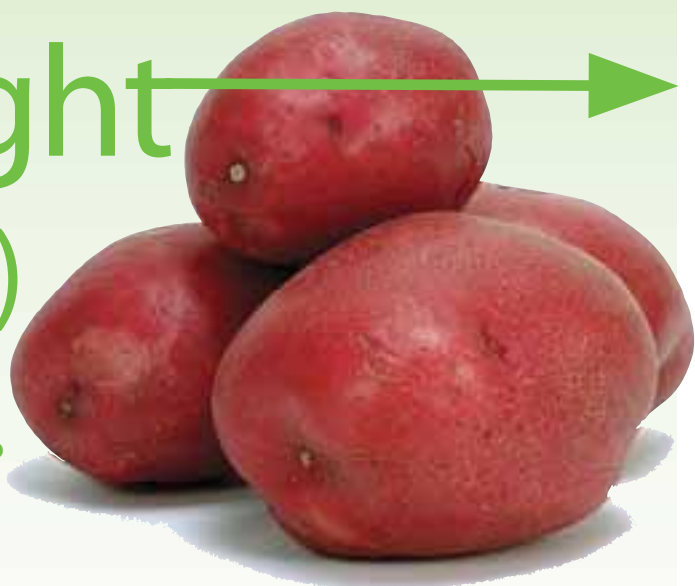


The IMUS hopper, seen here under construction, will liquefy the solid manure for anaerobic digesters.



The completed IMUS plant.

Fighting Blight (and the Beetle)



Research in Alberta is aimed at simultaneously resolving the biggest pest and disease issues for potato farmers – Colorado potato beetle and late blight.

There's a potato disease so insidious that researchers have spent significant amounts of time and money trying to battle it, to no avail. But with the work of Dr. Qin Chen, a Research Scientist at the Agriculture and Agri-Food Canada (AAFC) Research Centre in Lethbridge, there just may be help for potato producers who have to live under the threat of potato late blight. What makes Chen's work even more significant to the potato industry is that he is also working on combating the Colorado potato beetle – the number one insect pest problem for potato producers – at the same time.

Potato late blight is possibly the worst disease of potato, according to Chen. He says that if left untreated, potato late blight

can damage plants quickly, resulting in 100% yield loss in as little as two weeks. It was late blight that was the culprit in the infamous Irish potato famine of the 1800s. Potato growers currently use fungicide to combat late blight, but the use of chemicals brings with it concerns of its own – namely environmental concerns and increased costs of production for farmers.

In addition to the team in Alberta, Chen is part of a larger network of scientists working on late blight. Dr. H.W. (Bud) Platt, a Research Scientist at AAFC Charlottetown, a region known for its potato production, has been working with Chen to help expand the research into late blight resistance. "In the last 15 years there's been an increase of incidence in the world as we become more dependent on highly susceptible varieties and on fungicides to which the pathogen has become resistant," says Platt. "This research is extremely important as the degree of damage and the costs of late blight control affect farmers, consumers, and the environment."

Colorado potato beetle (CPB) is another major production problem for the potato industry. The beetle attacks by eating the leaf of the potato, killing the plant within a couple of weeks. While CPB is a big problem in Eastern Canada it has also been making inroads into Western Canada as well.

Chen's research is aimed at developing a potato variety resistant to both late blight and Colorado potato beetle. "If we can develop resistant cultivars by finding a naturally resistant gene, we can provide a tool to farmers and have a chemical-free way to control both of these pests," says Chen.

To that end, Chen has been hard at work for the last two years developing resistant germplasm – the starting material for breeders – and it's been a productive two years. Chen and his colleagues found a wild potato species that has resistance to both late blight and Colorado potato beetle and successfully transferred the resistance genes into cultivated potato.

The team worked through a number of challenges, but they persevered and were able to regenerate a plant from a cell. The final step was checking to see if this new plant had durable resistance to both late blight and Colorado potato beetle; preliminary results show resistance to both was achieved. "This is a very significant achievement in a short time of work," says Chen.

While this is a promising result, Chen notes that the effort is not yet over. "Now we have to work with the breeder," says Chen. "We have new potato germplasm, but we need more work to improve and multiply it. We also need to incorporate yield and quality characteristics before this would be available to farmers."

Chen is hoping to have a resistant potato variety available for farmers in the near future. He says the first variety will serve the potato chip industry, but there is also potential to use this research to develop a resistant potato for the table market down the road.

With the tenacity of researchers like Chen, and the contribution of funding agencies, potatoes should be a sustainable crop for some time to come.

r&d

Did you know?

- Potatoes were first cultivated in Peru in about 200 B.C.
- Potatoes are the fourth largest crop worldwide.
- Canada produces 4.3 million tonnes a year, with Alberta contributing 0.4 million tonnes.

Source: Potato Growers of Alberta



Edmonton to Calgary on 88 Heifers?



You would need about 88 Heifers in your fuel tank to travel from Edmonton to Calgary, according to research conducted by two University of Alberta Animal Science students.

Fraser Salmon and Derek Sears were just two of 46 students charged with finding the scientific answers to 23 questions about agriculture, including: If your car burned methane how far could you travel on the methane from one cow?

The students presented their answers to this and other questions at *There's a Heifer In Your Tank*, a first-time event where students, faculty, agriculture industry representatives, and the media gathered for what poultry professor and event organizer Dr. Frank Robinson describes as "learning when you least expect it."

"It showed that we can create a community of learning that consists of students, professors, and industry that works well," he told the audience of about 300 in late 2004.

In addition to the audience, the student's three-minute presentations were delivered to a sometimes serious, often humorous panel of Canadian Idol-like judges, including Jerome Martin, Publisher of Spotted Cow Press. Speaking to students at the end of the evening, Martin said he was impressed with the presentations and the format of the event. "Your best learning comes when you have an ideal setting such as this," he said. "It shows the kind of mutual respect it takes from both students and teachers to get learning accomplished."

Edmonton Journal columnist Scott McKeen agreed that while the presentations were great, the opportunity for learning was extraordinary. "I learned more today than I ever thought I wanted to know about agriculture," he joked, referring to two student presentations about sausage casings and the ingredients of a hot dog.

While each of the presentations were short, the audience left with more than a handful of interesting tidbits about agriculture and food. For instance, students Andrew Toma and Casey Jacobs did the math on how many gummy bears they could make from one cow and amazed even the panel with the answer. Based on a 600-kilogram cow, more than 500,000 gummy bears could be produced.

Have you ever wondered what caused double-yolked eggs? Michelle Leitch and Jaime Crowe dispelled the myth that it was because the hens were mated twice per day. They also explained the biology of egg formation with impressive graphics which showed they knew the answer and a lot more about chicken reproduction.

Students Chelsea Hilder and Dana Penrice used their quick presentation to dispel the myth that chocolate milk comes from brown cows, and instead revealed that chocolate milk includes an ingredient called carrageenan, a form of seaweed.

"The evening was a sample of how much fun agriculture research can be," says Freda Molenkamp, Programs and Partnerships Leader for the Alberta Agricultural Research Institute and one of the evening's panel judges.

Darcy Fitzgerald, panelist and General Manager for the Alberta Livestock Industry Development Fund, agreed, noting that the industry is very supportive of agriculture students and this kind of learning environment. "The livestock industry is behind you 100%," he told students. "The industry puts a lot of value into what you do."

Many of the agriculture industry's leading organizations, including Growing Alberta, Alberta Milk, Alberta Pork, Alberta Chicken Producers, Alberta Turkey Producers, Alberta Beef and the Alberta Egg Producers donated door prizes and goodies for questions from the audience. Robinson says some of these questions may become the theme for the next event, which he hopes will be even bigger and better next time.

Robinson's wish will come true this spring. At *There's STILL a Heifer In Your Tank*, 72 students will present to an anticipated audience of more than 700. **r&d**



Science, Creativity, and Farmer Input

The Elements of Innovation

Kenton Ziegler provides a producer's perspective on the importance of research and development, and more specifically one of its critical elements – farmer input.



Kenton Ziegler

A centennial celebration is an opportune time to review all that has been accomplished in Alberta agriculture over the past 100 years. Crops better suited to Alberta conditions, irrigation and dryland farming practices, new breeds of livestock, to mention just a few – all have led to significant changes. There is no doubt, in my mind, that we have made a quantum leap forward, and that much of this progress is due to innovation.

The Critical Third Element

I believe innovation can only occur when science and creativity come together, and I think the successes of today, in all aspects of life, are due to R&D. However, in agriculture there is a third element which must not be diminished in importance, and that critical element is the input of farmers. Farmers are the folks who must take the results from the research and development teams and implement them in their own operations. Farmers are the ones who often discover the impediments to the adoption of new technologies, agronomics, economics, or otherwise. Put another way, if it doesn't make farm sense it won't work.

The emergence of canola as a major crop in Alberta provides us with a prime example of the way out-of-the-box thinking can lead to breakthroughs. With its origin in rapeseed, canola is the product of visionary researchers who developed a seed with

fewer undesirable characteristics and more sought-after qualities. Producers did their bit by demonstrating a willingness to grow the new crop and market demand did the rest. In 2003, canola contributed \$550 million to the Alberta economy.

Farmer Involvement

The research to develop canola was publicly funded. Today, we have much more industry involvement in the funding of research than in the past. This is a positive change and I am firmly committed to such partnerships between public and private sectors. Nonetheless, I also believe that some research with long-term goals needs to be jointly funded by the producers and the public.

Currently, through various partnerships, we are in a struggle to develop canola varieties which will avert new diseases. As well, Alberta grower groups are funding breeding programs for Polish canola and, although it may not make much short-term commercial sense because of the diminishing number of acres planted, this work makes good sense to growers who are eager to see progress with early maturing, shatter resistant varieties. Whoever funds it, it is R&D that will bring us new traits and new varieties which may lead to non-traditional uses of common field crops.

Applying the Results

One aspect of R&D which has caused farmers frustration is the technical language in which results are written. Happily, that is changing. Today there is much more emphasis on making research accessible – in fact, the ability of the researchers to communicate their results is one of the criteria Alberta's Agriculture Funding Consortium uses to make funding allocation decisions. After all, if farmers can't understand and apply the results, what's been discovered will be of little or no use to them.

What will the next 100 years bring? New technology will bring developments to us at hyper-speed. R&D affects energy efficiency and time management, making it possible for us to farm more acres with less manpower than ever before. Our progress to date is nothing short of astonishing. The next century will bring even more opportunity and excitement. Let's dare to dream. r&d

Kenton Ziegler farms near Beiseker, Alberta, and is the Past Chair of the Alberta Canola Producers Commission.

This is part of a series of rotating editorials that captures Words of Wisdom from people in the sector.

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→ Agricultural Research and Innovation in Alberta ←

fall 05

In the next issue



Move over beer – barley isn't just for malt anymore; it may soon be found in cookies and other baked goods. Researchers are introducing healthy products baked with barley flour, already available through a Calgary bakery and the Calgary Health Region.

Nutraceuticals are a growing market, and red clover may be Alberta's key to tapping into this lucrative sector. Researchers are uncovering the medicinal properties of red clover that show tremendous potential to fight disease on several fronts and create a value-added industry in the province.

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