

2009 ANNUAL REPORT

Our
knowledge
is your
Advantage



DEPARTMENT OF
AGRICULTURAL, FOOD
& NUTRITIONAL SCIENCE
UNIVERSITY OF ALBERTA



MISSION STATEMENT

To serve the community through excellence in teaching and research in:

- efficient and sustainable agricultural production
- value added processing
- food safety
- human health

to improve the health and quality of life.





Dr. John Kennelly
and Dr. Erasmus
Okine

Celebrating success

The Department of Agricultural, Food and Nutritional Science continued its remarkable record of accomplishment in 2009/10 in research, teaching and service.

The success of two research programs was recognized as both received significant additional funding, enabling them to expand their mandates. The Alberta Bovine Genomics Program became Livestock Gentec while the Bioactive Oils Program morphed into the broader Centre for Performance Oilseeds and Bioactive Oils. You can read about their expanded roles in the following pages.

Student enrolment in the Nutrition and Food Science program continued its tremendous growth. Meanwhile the department took the lead role in developing a BSc in Animal Health, a new and unique Canadian program that increases students' learning opportunities and further ensures that the faculty and department remain at the forefront of agricultural education. In addition, undergraduate student participation in research was expanded, thereby enhancing experiential and problem-based learning opportunities.

The department upheld its fine tradition of engaging the community at large as it staged its well-known *Heifer in Your Tank* program in Lacombe, Alberta, hosted the annual Banff Pork Seminar and the Western Canadian Dairy Conference and initiated a seminar series, bringing together industry and academia.

All this and much, much more bodes well for the future of the department as it looks forward to meet the challenges and seize the opportunities that lie ahead.

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Realizing potential

The completion of my first term as AFNS Chair in 2009 was a chance to reflect on progress, contemplate our challenges, and work to build on success.

One cornerstone of our success is people. We continue to attract outstanding academic leaders – during my first term, 33 new faculty were hired or seconded to AFNS. Graduate student enrolment increased by 70%; undergraduate enrolment by 14%. Our track record for student job placements is 100% after two years, with 84% employed in industry and 16% in academia. We have also been successful in attracting major funding to develop the land and facilities at the Kinsella and St. Albert Research Stations, strengthen the Value Added Meats Program, and create two new research centres on beef genomics and oilseeds.

These are just some of the results of a long-term strategic effort to broaden and strengthen our connections with external parties. Witness the increase in funding to AFNS over the past five years: federal funding up 16%, provincial up 34%, and industry up 182%. The AFNS advantage is clear: when research and training of students needs to be done, AFNS has the network already in place. Our connections across campus and with government agencies mean we can easily assemble a team to do the work.

In the coming years, we plan to launch initiatives to further establish AFNS as the benchmark amongst our peers across the country. I invite you to read about our successes and share the excitement as we realize the tremendous potential of our department.

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innovation & collaboration

Dr. David Bressler

Biorefining set to take off

Talk about hitting the ground running. Only months after its establishment in July 2009, the Biorefining Conversions Network (BCN) had attracted significant interest from industry – in addition to existing multinational partners Sanimax and Syngenta – and developed a collaboration with a major bio-industry initiative in Drayton Valley. “The pace has been very, very fast. It speaks to the relevance of the work we’re doing,” says BCN Director and AFNS Associate Professor Dr. David Bressler.

The BCN is a University of Alberta research network focused on development and commercialization of biorefining conversion technologies. Biorefining is similar to petroleum refining except that the feed is from traditional agriculture and forestry sectors. It involves fractionating biomass into high-value components and then converting those components into a multitude of products such as biofuels, platform chemicals, industrial solvents, bioplastics and food and nutraceutical products. “The key is to get the most value from each component – whether fuel or food. It’s not food versus fuel,” emphasizes Dr. Bressler.

Whereas biorefining expertise has traditionally been

centered in individual faculties, departments and agencies, the BCN is a multidisciplinary network that facilitates collaborative research projects between industry, government and academia. The network is supported by a three-year, \$3-million investment from the Alberta Ministry of Advanced Education and Technology.

With Alberta’s wealth of biomass (including agricultural by-products, crop residues, and by-products from the forestry sector), a highly-skilled labour force, and world-class research centres, the province is the ideal location for the establishment of a thriving biorefining industry. For example, Drayton Valley has established the Bio-Mile, an industrial park that is attracting world-class firms to develop new technologies to use and convert the region’s forestry and agricultural biomass into globally competitive products. The BCN has been working closely with the Bio-Mile.

“There’s massive potential in biorefining to reinvent agriculture and forestry,” notes Dr. Bressler. “We’re at the leading edge of this effort in Canada.”

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And the ASTech goes to . . .

Two AFNS scientists have won a prestigious award from the Alberta Science and Technology (ASTech) Leadership Foundation. Professor Emeritus Dr. Michael Stiles and Professor Dr. Lynn McMullen won the 2009 Dow AgroSciences/ASTech Award for Innovation in Agricultural Science. Their research on a lactic acid bacteria that kills the deadly listeria bacteria led to a technology that can reduce the risk of foodborne illness.

Every year an estimated 11-13 million Canadians suffer from foodborne illnesses. In 2008, a severe outbreak of listeriosis led to 22 deaths in Canada. "Usually, listeria gets onto the food product after it has been cooked and before it is packaged," explains Dr. McMullen. "This is where we have an opportunity to add the lactic acid bacteria instead of chemical agents." The listeria technology is called Micocin®.

Another invention from the team is Procin®, a genetically modified bacteria proven to reduce the incidence of scours (diarrhea) in piglets. To commercialize and market Micocin® and Procin®, in 1998 Drs. Stiles and McMullen created CanBiocin Inc., a spin-off company from the University of Alberta. Miocin® has been approved for use in the U.S. and Health Canada approval is pending.

"It's tremendously satisfying to see our science lead to commercialization and application in the real world," says Dr. McMullen. "We have a number of companies waiting to use it once the Canadian government approval goes through."

The leading-edge research of food scientists like



Drs. Stiles and McMullen has brought international recognition to AFNS for its strengths in food safety, value-added processing and product and process development. Because respected researchers are also involved in teaching, AFNS has developed a reputation for training highly-qualified professionals for North America's agri-food and agri-industrial industries.

"It's gratifying to teach the next generation of scientists, industry leaders and educators," Dr. McMullen says. "It's definitely a big part of what keeps us motivated."

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Dr. Michael Stiles and
Dr. Lynn McMullen





Dr. Lloyd Dosedall

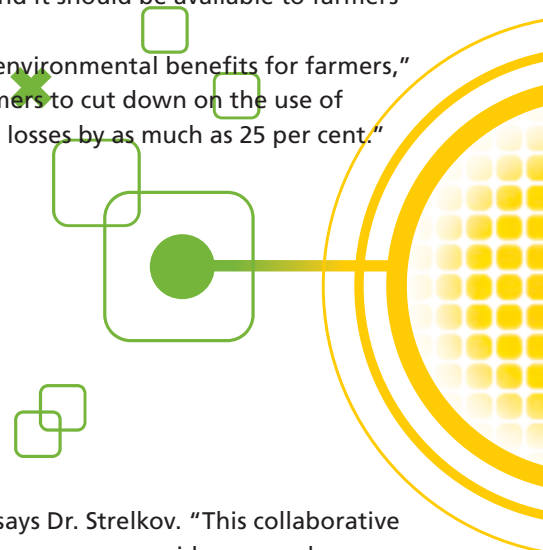
New canola hybrid resists weevil attack

A canola bred to resist the cabbage seedpod weevil – a major threat to canola crops in southern Alberta and southern Saskatchewan – has been developed by AFNS Professor Dr. Lloyd Dosedall and Dr. Laima Kott, a colleague from the University of Guelph. The cabbage seedpod weevil is not native to North America, and without natural enemies its populations have exploded and are causing serious losses in yield and crop quality.

Since 2001, Drs. Dosedall and Kott have been working to develop a canola that is resistant to attack by the weevil. For a source of resistance, they used white mustard, which is completely resistant to the weevil. After many crosses, selections and field testing, the result is a new canola type that has a much improved level of resistance to this pest than other canola varieties. The team has released the new germplasm to the seed industry and it should be available to farmers by 2011.

“The hybrid has economic and environmental benefits for farmers,” says Dr. Dosedall. “It will allow farmers to cut down on the use of insecticides and may prevent crop losses by as much as 25 per cent.”

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Getting the jump on a deadly canola disease

AFNS researchers have mounted a major research effort on clubroot, a devastating disease of cruciferous crops that recently began showing up in canola. Clubroot was first found on canola in Alberta in 2003. Severe field infestations in the province have caused total yield loss.

Recognizing the seriousness of the situation, AFNS Associate Professor Dr. Stephen Strelkov began clubroot research when he joined AFNS in 2003. He was soon joined by AFNS Associate Professor Dr. Habibur Rahman, as well as researchers from other institutions.

Now, there has been a huge boost to clubroot research – a \$2-million initiative funded by the AAFC Growing Forward Science and Innovation Framework. Dr. Strelkov is the overall scientific lead for the research, which is focused in three areas: pathology (led by Dr. Strelkov), breeding (led by Dr. Rahman) and disease management (led by AAFC’s Dr. Gary Peng and AARD’s Dr. Sheau-Fang Hwang). “We’re leveraging the expertise we have and taking the research

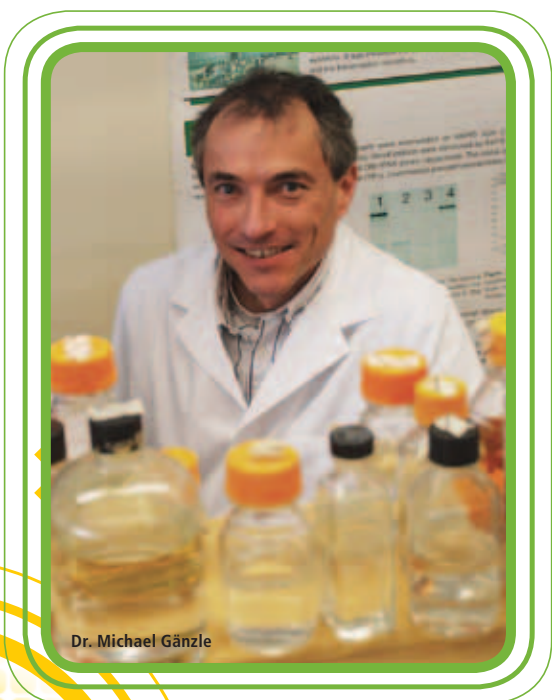
to the next level,” says Dr. Strelkov. “This collaborative approach will allow even more rapid progress by facilitating the development of multi-faceted, sustainable strategies for clubroot management.”

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Dr. Habibur Rahman
and Dr. Stephen Strelkov



Dr. Michael Gänzle

Consumers push for “clean labels”

With the increasing demand for foods that are free from artificial additives, “clean label” is a hot topic in the food industry. AFNS Associate Professor, Dr. Michael Gänzle is on the leading edge of research aimed at reducing or eliminating additives or modified ingredients in food. In particular, he studies food germ killers that are naturally derived.

“Finding alternatives to current food preservatives is an ongoing, important area in food science,” Dr. Gänzle says. “If you replace chemicals with a natural preservative, without compromising safety, food quality is better.”

In one research project, Dr. Gänzle and his team identified a type of lactic acid bacteria that makes propionic acid, which is used to prevent mould growth in bread. Currently, bread makers add the chemical calcium propionate to preserve bread. Propionic acid made by bacteria has the potential to replace this additive. The researchers took the project to proof of concept; an industrial partner is now exploring its commercial potential.

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Heart-healthy egg proteins

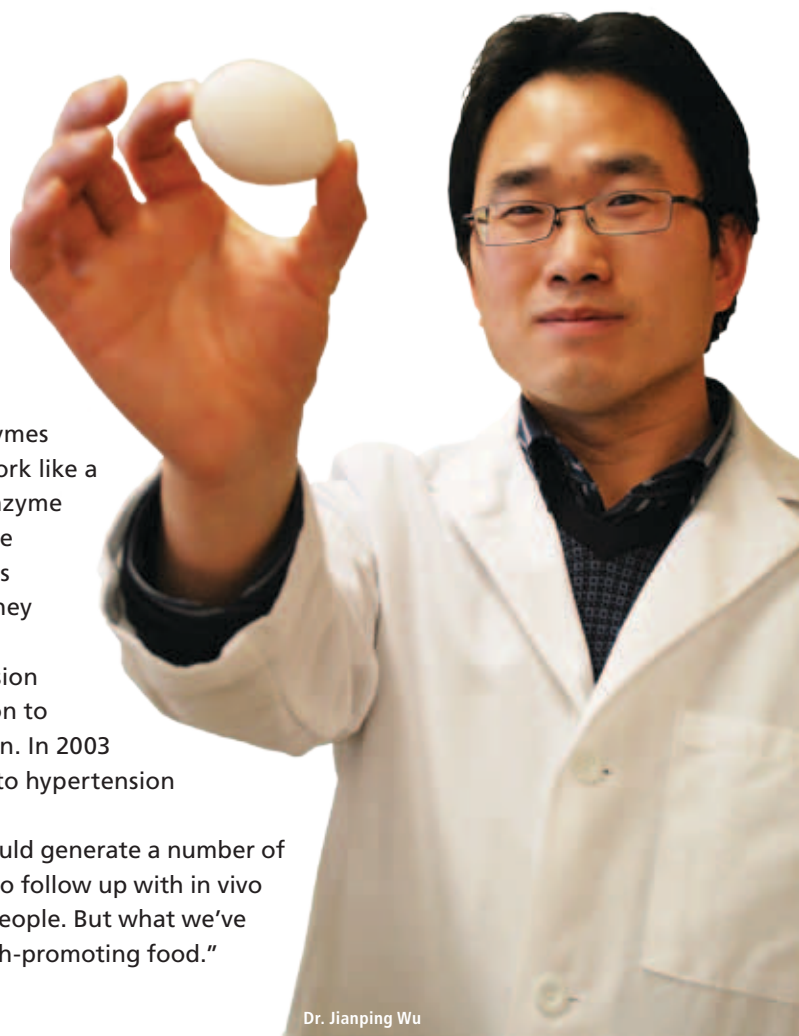
Avoiding eggs may not be the best way to protect heart health, according to research done by AFNS Assistant Professor Dr. Jianping Wu and his graduate student Kaustav Majumder. They found that proteins from eggs may be just as effective in reducing high blood pressure as certain prescription drugs.

The study, published in the *Journal of Agricultural and Food Chemistry*, showed that egg proteins can be converted by enzymes in the stomach and small intestine to produce peptides that work like a group of pharmaceuticals known as angiotensin-converting enzyme (ACE) inhibitors. ACE inhibitors are often the first choice for the treatment of high blood pressure. Interestingly, the researchers found that eggs have more ACE-like inhibiting activity when they are fried than when they are boiled.

According to the Public Health Agency of Canada, hypertension affects almost one in four people. It is the most common reason to visit a doctor and the number one reason for taking medication. In 2003 in Canada, physician, medication and laboratory costs related to hypertension totalled more than \$2.3 billion.

“Our results showed that in-vitro digestion of cooked eggs could generate a number of potent ACE inhibitory peptides,” notes Dr. Wu. “Now we need to follow up with in vivo work to determine just how effective these proteins can be in people. But what we’ve seen to date is further evidence that eggs are an excellent health-promoting food.”

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Dr. Jianping Wu



Dr. Spencer Proctor

Research reveals health benefits of natural trans fats

A 2009 New Investigator Salary Award from the Heart and Stroke Foundation of Canada is just one indication of how successful AFNS Associate Professor Dr. Spencer Proctor has been at changing mainstream thinking about dietary fat and its relationship with cardiovascular disease.

Dr. Proctor is an internationally recognized leader in the study of the health implications of natural ruminant trans fats, in particular conjugated linoleic acid (CLA) and its precursor, vaccenic acid. In its natural form, CLA is produced only by ruminant animals and is commonly found in products such as milk, yogurt, cheese and beef. Unlike the harmful hydrogenated trans fats created through industrial processing, naturally occurring CLA and related vaccenic acid obtained from dairy and beef products show remarkable health potential.

Dr. Proctor's team at the Alberta Institute for Human Nutrition was the first to discover the novel lipid-lowering properties of natural trans fats. In animal trials, feeding of natural trans fat was associated with a major lowering of triglyceride levels and a modest lowering of both total and LDL (low density lipoprotein) cholesterol levels – all key risk factors for cardiovascular disease and other health problems. Dr. Proctor's team also demonstrated that natural trans fats have a substantial impact on the intestinal absorption and secretion of lipids. These findings point to the potential for diets with enhanced natural trans fats to help reduce risk factors for cardiovascular disease.

Much of the research on natural trans fats in Canada is undertaken by the CLA network, a multidisciplinary, cross-Canada team of representing producers, industry, government, and academia. The network has built a substantial track record in revealing the healthy components of dairy and beef. Dr. Proctor is the Science Lead of the CLA Network.

"Food is one of the most basic and important health tools we have," says Dr. Proctor. "As we learn more about the natural health benefits found in many everyday foods, there are more reasons to enjoy these foods as part of healthy living. Consumers and health professionals alike are increasingly interested in getting health benefits from the kitchen rather than the medicine cabinet."

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Maternal nutrition in the spotlight

The old adage “you are what you eat” still rings true. Numerous studies have found that nutrient levels in our bodies are related to our physical and mental health. Scientists know much less, however, about the relationship between prenatal nutrition and health, for both mother and child. APrON (Alberta Pregnancy Outcomes and Nutrition) is a study involving 10,000 women from Calgary and Edmonton that will analyze the relationship between maternal nutrient status during pregnancy and maternal mental health and child health and development.

“We know how much nutrition a pregnant woman requires to meet her basic nutrient needs and those of her infant,” says AFNS Professor Dr. Catherine Field, one of the leaders of the APrON team. “But very little has been done to define nutrition in terms of functional outcomes – for example, how nutrition affects the mental health of the mother or the neurological development of the child. That’s what our team is exploring.”

The APrON team is comprised of 16 researchers from the University of Alberta, University of Calgary and University of Tilburg (Netherlands). Study results may lead to educational or interventionist policies to help women consume a nutritious diet during pregnancy. Over 650 women are currently in the study. Information about how to participate can be found at www.apronstudy.ca. APrON is funded through the AHFMR Interdisciplinary Team Grant program*.

*AHFMR is now Alberta Innovates – Health Solutions

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Practical health advice for diabetes patients



There is strong evidence that people with Type 2 diabetes can improve their health by eating a well-balanced diet and maintaining a physically active lifestyle. But that is easier said than done. Now, an innovative research initiative is aiming to help by developing a practical “toolbox” of physical activity and diet.



The study is called PANDA (Physical Activity and Nutrition for Diabetes in Alberta). AFNS Professor Dr. Catherine Chan is the principal investigator and leads an extensive, multidisciplinary research team. The project involves research on Alberta food products, cost-friendly foods that are appropriate and accessible for those with diabetes, a nutritional guideline that can be easily used by those with diabetes, and physical activity options suitable for those with diabetes.

“With diabetes on the rise across Canada, it is important to find out why it is so difficult for people to follow diet and lifestyle recommendations,” says Dr. Chan. “PANDA’s approach is innovative in its broad range of method. We want to make a real difference by finding measures that assist people with diabetes to live fuller lives.”

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Bob Rimes

AFDP driving force

With 25 years working in a variety of industries – including mining, oil and gas, biomass, and recycling – Bob Rimes brings a wealth of diverse experience to his job as Executive Director of Agri-Food Discovery Place (AFDP), which he began in June 2009. But it's his expertise that makes him a perfect fit for the position: "My strengths are managing people, increasing production and improving process efficiency." Bob's focus is optimizing the facility and attracting industry, particularly small and medium-sized businesses. He notes that AFDP is unique in North America and can support scale-up in almost any biorefining and bioprocessing application. AFDP is open for business.

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One job, three roles

When AFNS recruited Dr. Tom McFadden from the University of Vermont in 2009, the department acquired more than a lactation physiologist who studies milk production efficiency and mammary function. Dr. McFadden fills three key roles: researcher, academic leader and educator. "I came here because of the opportunities in all these areas. There's excellent support from the dairy industry for research, education and technology; a terrific facility for dairy science; and highly productive colleagues. In addition, AFNS is one of only a few university departments in North America that successfully integrate across species and across the value chain."

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Dr. Tom McFadden



Dr. John Bell

Student exchange launched career

When John Bell arrived at the U of A in 1996 as an IAESTE* exchange student, he was on a one-year adventure from his home in Ireland. A PhD, a post-doc and work in Alberta stretched that one year considerably. "I worked for a year as a lab tech in Dr. John Kennelly's lab. I had planned to return home to Ireland but instead accepted an offer to do graduate studies in Dairy Science." Dr. Bell then went on to work as Research Manager for the Alberta Livestock Industry Development Fund. In April 2009, he became Assistant Chair, Administration, for AFNS. The wide-ranging job includes budgeting, finance, human resources, space allocation and strategic planning. "It's great to be back in the department. The commitment to excellence makes AFNS a great place to work."

**IAESTE is the International Association for the Exchange of Students for Technical Experience*

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Dr. John Basarab

High-impact research

The Canadian beef industry has many supporters but few have done as much as Dr. John Basarab. As Senior Beef Research Scientist with Alberta Agriculture and Rural Development, Dr. Basarab has more than 25 years experience in beef cattle production and management. He has been an AFNS Adjunct Professor since 1993 and works closely with the Bovine Genomics Program. One of the major impacts of his research is a better understanding of residual feed intake (RFI) and its associated traits. "I believe RFI is the greatest opportunity we have to increase the profitability of beef production at the farm level."

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New markets need new beef grading system

With Canada's beef grading system tied primarily to the U.S. system, it is a challenge for Canadian producers to pursue new and diverse global markets. And yet, there's strong growth in new markets such as ultra-lean meat for North American consumers and high-fat beef for many Asian markets. This conundrum is being tackled by AFNS Adjunct Professor Dr. Laki Goonewardene, who is a Research Scientist with Alberta Agriculture and Rural Development. His research focuses on understanding the mechanisms of muscle and fat growth in beef cattle, with a view to using this information to develop a flexible grading system. "Alberta has the genetic stock to serve a variety of markets but we need a grading and marketing system driven by consumer preferences."

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Dr. Laki Goonewardene

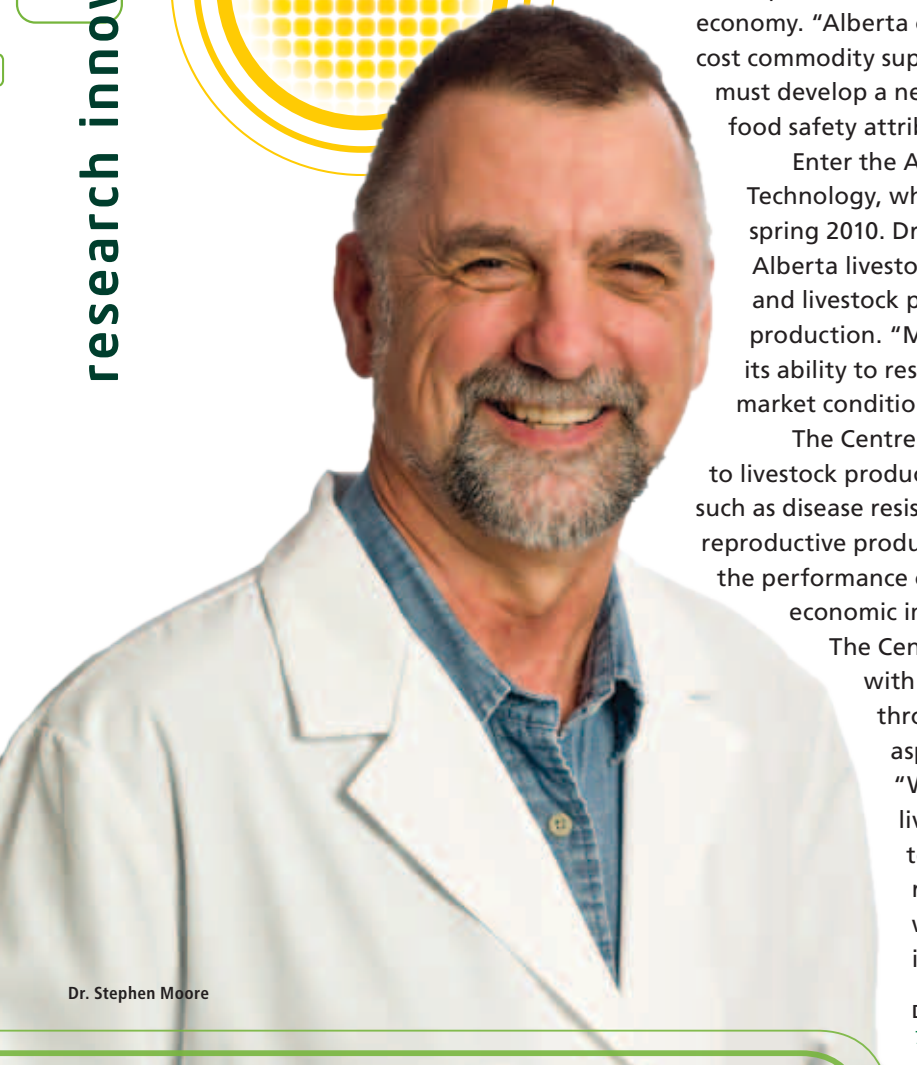
Value-added in action

With his job as Feed Research Scientist at Alberta Agriculture and Rural Development, numerous collaborations with AFNS researchers and cross-Canada links with various research clusters, it's difficult to follow exactly who Dr. Eduardo Beltranena is working with on any given day. "Collaboration is the best way to get research done." Dr. Beltranena's research is on the feeding value of novel grains, oilseeds and pulses. He is a leader in the air classification of field pea and faba beans (a low-value commodity) into high-value protein and starch concentrates. "This is a great example of using technology to increase the value of agricultural commodities."

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Dr. Eduardo Beltranena



Dr. Stephen Moore

Transforming Alberta's livestock industry

Compared to their major competitors in the U.S., Alberta livestock producers are currently facing a cost gap that has serious financial consequences for their operations, rural Alberta, and the Alberta economy. "Alberta can no longer compete in world markets as a low-cost commodity supplier," says AFNS Professor Dr. Stephen Moore. "We must develop a new competitive platform based on new quality and food safety attributes."

Enter the Alberta Ingenuity Centre for Livestock Genomics Technology, which will be launching with its official name in spring 2010. Dr. Moore is leading this initiative to transform the Alberta livestock industry into a leading-edge supplier of meat and livestock products known for quality, safety and efficient production. "Most importantly, the industry will be known for its ability to respond rapidly to changing consumer demands and market conditions," adds Dr. Moore.

The Centre will apply genomics and related technologies to livestock production. The research team will work on attributes such as disease resistance, increased feed efficiency and increased reproductive productivity linked to superior quality. Improvements in the performance of any or all of these attributes will have significant economic impacts at both the farm and industry levels.

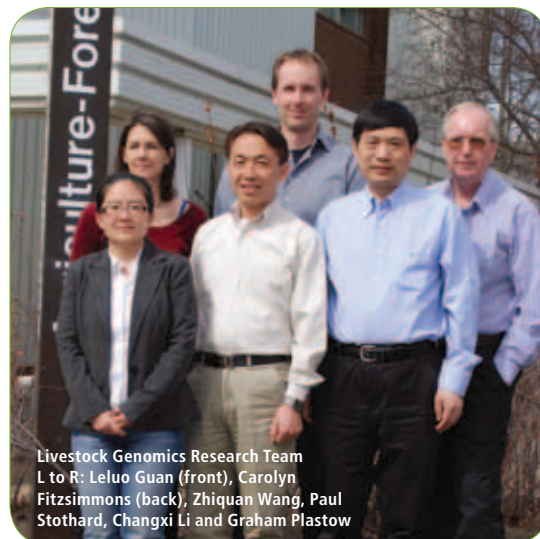
The Centre will serve as an integrated hub of excellence with a critical mass of research strength that provides, through a network of partners, expertise in all aspects of genomics research and application. "We're developing a 'one-stop shop' for Canada's livestock industry to access and implement genomics technology that is customized to its unique requirements," says Dr. Moore. "Genomic capability within Alberta and Canada is critical to the livestock industry's long-term success."

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Strong foundation

The Alberta Ingenuity Centre for Livestock Genomics Technology is building on the foundation of the Bovine Genomics Program at the University of Alberta, which received funding from the former Alberta Agricultural Research Institute, now part of Alberta Innovates – Bio Solutions, and the Alberta Livestock Industry Development Fund, now integrated into the Alberta Livestock and Meat Agency. The Centre is receiving additional funding of \$3.75 million from Alberta Innovates and the Alberta Livestock and Meat Agency.

The Centre also has partnerships with Agriculture and Agri-Food Canada, Alberta Agriculture and Rural Development, Olds College, University of Guelph, University of Saskatchewan and the University of Calgary, as well as more than 20 industry partners.



Livestock Genomics Research Team
L to R: Leluo Guan (front), Carolyn Fitzsimmons (back), Zhiqian Wang, Paul Stothard, Changxi Li and Graham Plastow

Expanding markets for oilseeds

The future for oilseed crops has never been so bright. The market is growing for specialty oils with enhanced nutritional profiles for health supplements, and livestock and aqua feed additives as well as oils that are feedstocks for bio-products including biodiesel. Alberta is poised to become a global leader in these areas and research will be critical to this achievement. A key player is the new \$2.5-million Centre for Performance Oilseeds and Bioactive Oils (POBO Centre).

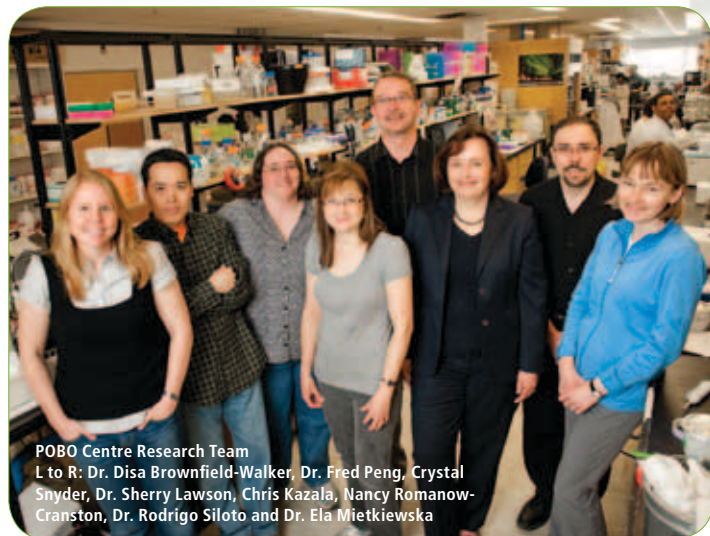
The Centre is led by AFNS Professor and Tier I Canada Research Chair Dr. Randall Weselake, who is internationally known for his research in the molecular biology of storage lipid biosynthesis in oilseeds. POBO team members are expert scientists in molecular biology, genetics, biochemistry, plant breeding, nutrition, lipid analysis, bioinformatics, oil processing and functionality testing.

“We’re building on the collaborative network of the existing Bioactive Oils Program to create a world-class innovation Centre at the University of Alberta,” says Dr. Weselake. “Our focus is innovation aimed at increasing canola seed oil content, creating new enhanced designer plant oils and developing a suite of next-generation oilseed development tools, techniques and technologies.”

Industry partners are an important part of the POBO Centre, not only providing financial resources, but also directly involved in research direction and subsequent commercialization. Training opportunities for research associates, post-doctoral fellows, students and research technicians will be many and varied. This will lead to uniquely qualified personnel who possess the broad base of skills and experience needed for continued leadership in the rapidly growing biotechnology industry in Alberta.

Funding for the POBO Centre comes from Alberta Innovates – Technology Futures. In addition, funding of \$6.25 million has been secured from the Canada Foundation for Innovation and Province of Alberta for equipment and renovations to the Agriculture/Forestry Centre.

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POBO Centre Research Team
L to R: Dr. Disa Brownfield-Walker, Dr. Fred Peng, Crystal Snyder, Dr. Sherry Lawson, Chris Kazala, Nancy Romanow-Cranston, Dr. Rodrigo Siloto and Dr. Ela Mietkiewska

Oilseeds have huge economic impact

The seed, oil and meal from Canadian canola and flax production account for over \$3.5 billion in exports, annually. In addition, the domestic production and processing sectors employ more than 60,000 Canadians and contribute more than \$13 billion annually to the national economy. This impact is projected to increase to greater than \$16 billion in the next decade, with increases of 50-70% in canola oil production required within the next 7 to 10 years to keep up with the projected demand for this commodity.

Dr. Randall Weselake

Renovations slated for research stations

A massive redevelopment of the Kinsella and St. Albert Research Stations is underway, thanks to \$12 million in funding from the Alberta government. "This funding comes just at the right time," says AFNS Chair Dr. Erasmus Okine. "The money will go toward reinvigorating the aging infrastructure at Kinsella and establishing new infrastructure at St. Albert."

The University Research Ranch is located at Kinsella, 150 km southeast of Edmonton. It was established in 1960, the vision of former ALES Dean Dr. Roy Berg who saw the need for a beef cattle breeding facility. But the facilities at the Ranch are now outdated.

"The Kinsella facilities have served their time," notes Dr. Barry Irving, manager of the research stations. "There's a new approach to the research, and the infrastructure must keep pace. The \$3-million bovine genomics program is focussed on improving feed efficiency, and the cattle for that program will all be at the Ranch."

Renovation and construction projects include upgrading of the individual feed intake system, replacement of key animal handling buildings (complete with small pens for intensive individual animal research), and upgrades to service buildings such as student housing and the feedmill.

The Ranch covers 12,000 acres of rangeland; its herd numbers about 700 beef cows. Research scientists from Agriculture and Agri-Food Canada are now co-located at the Ranch. "There's a lot of value in a facility like Kinsella, and we're seeing more and more agencies developing partnerships with us," notes Irving. "Going forward, Kinsella is becoming more of a partnership-type operation."

Unlike Kinsella, the St. Albert Research Station has no existing facilities. The 800-acre farm was a gift to the University from the Bocock family in 2008. New buildings to be constructed include a field research centre complete with meeting space, machine shop, and equipment storage.

The St. Albert Research Station will become a very busy place for agronomic and environmental research as the Ellerslie Research Station winds down. Two research crops were planted in 2008 immediately after the property was transferred and several more have been added since. Research projects on biofuels, rotations including pulse crops, and application rates for biosolids are underway.

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Dr. Bob Christopherson:
Bringing the farm back home

Since retiring in 2004, Dr. Bob Christopherson has taken on the usual busy schedule of an emeritus professor. But he has also taken time to think more broadly about agriculture, sparked by a stay at the University of Hohenheim in 2009. While there, he visited a number of specialized farms throughout Europe. “What struck me was that farmers marketed many products directly. In Canada, we’ve almost lost that aspect of agriculture. However, establishing more locally processed specialty products to fill niche markets could provide more opportunities for young people to earn a meaningful living from agriculture, reducing dependence on imported food and large multinational companies.”

Dr. Fred Wolfe:
Retirement is a misnomer

When Dr. Fred Wolfe took early retirement in 1993 and moved to Arizona, his plan was to take it easy. But barely a year passed before the AFNS Professor Emeritus showed up on the University of Arizona’s radar; he joined the faculty and began teaching. Dr. Wolfe also began experimenting with online learning, eventually winning a US National Science Foundation grant to measure learning outcomes. In 1996, Dr. Wolfe became Head of the Department of Nutritional Sciences. He retired – again! – in 2006. But don’t look for him in the arts and crafts room. He teaches nutrition online at a community college and instructs water aerobics classes.



Dr. Art Bailey:
Redefining “mellow”

Known for his strong opinions, Dr. Art Bailey claims that retirement has mellowed him. Mellow might not be the best description for this feisty academic who developed the science of rangeland ecology and management at the U of A. Dr. Bailey still champions his causes through an active consulting career; one of them is responsible range management. He recently co-authored “Management of Canadian Prairie Rangelands.” Still on his to-do list: write a how-to book about using prescribed burning responsibly. And in keeping with his somewhat relaxed schedule: spend more time with family, friends and golf clubs.



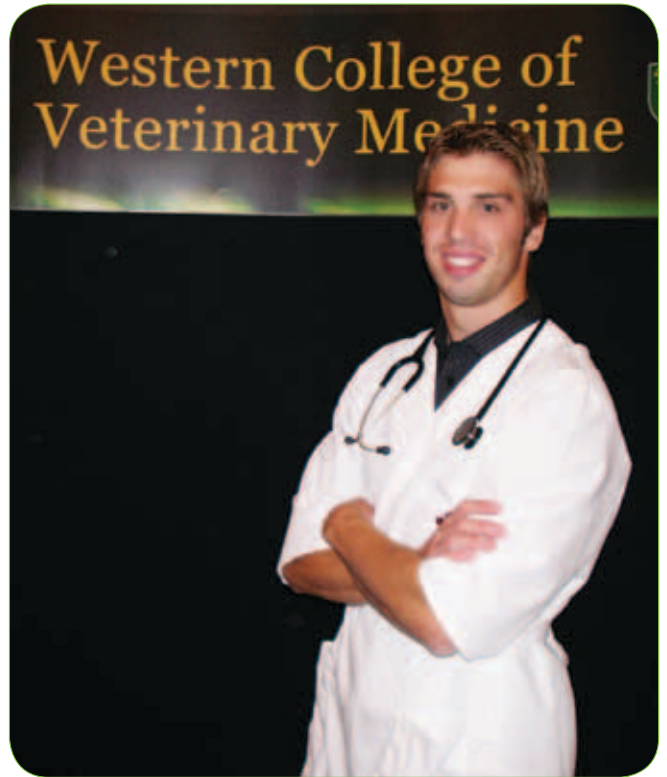
Leslie Howe:
Internship opens doors

Ever since high school, Leslie Howe (B.Sc. Nutrition and Food Science, 2010) knew she wanted to do something in science. "Nutrition seemed like a fun and practical way to apply science," she says. Leslie is now working toward a career as a Registered Dietitian (RD) and taking the University of Alberta Integrated Dietetic Internship, which is based in AFNS. In July 2009, Leslie completed her first professional practice course in Peace River. "Because Peace River is a small community, I got to try my hand at many different things including patient counselling, acute care, and continuing care. The people in the town were so welcoming and inclusive. The placement turned out to be one of the best experiences I've ever had."

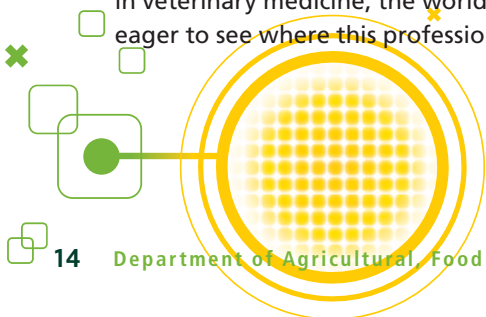
Leslie says the Internship is also a great way to refine career plans. "An RD can work in so many fields; it's difficult to know which will suit you best. The Internship can help sort this out."

Eric Lawrence:
All in the family

With his father, two brothers and a sister-in-law all veterinarians in Alberta, Eric Lawrence did consider bucking the family tradition and not becoming a vet. But then he thought about it. "My brothers and I grew up knowing this is a great profession. Dad showed us every day in the way he talked about his work and how the community regarded him. We've all been inspired by him." Eric graduated from the Faculty of ALES in 2008 and was accepted to the Western College of Veterinary Medicine at the University of Saskatchewan in 2009. "A degree from U of A, which has had a long-standing agriculture and research program, carries considerable prestige," he says. While vet school is incredibly hard work, Eric is enjoying the courses immensely. As for what he will do after graduation, he is not making any predictions. "We've had graduates come in and tell us about what they're doing now. There are so many different opportunities in veterinary medicine, the world is my oyster. I'm eager to see where this profession takes me."



For undergraduate program information, please contact the **Faculty of Agricultural, Life & Environmental Sciences** Student Services office at questions@ales.ualberta.ca



Dr. Heather Mason:
Recent PhD focuses on applied research

When Heather Mason started her undergraduate studies at AFNS, she thought horticulture would be her chosen field. But a course with AFNS Professor Dr. Dean Spaner changed her outlook. “Dean opened my eyes to the importance of agriculture both at home and internationally.” She went on to do a PhD with Dr. Spaner, graduating in 2007. Dr. Mason is now Assistant Professor of Cropping Systems at Montana State University. She works at MSU’s Northwestern Agricultural Research Center, east of Kalispell, one of seven such centres across the state. “Our mandate is to do applied research that serves the needs of our area. I am involved in a variety of projects – including studies on soil fertility and crop rotations – on many different crops. It’s a great job.”



For graduate program information, please contact
 Emily St. Pierre, *Graduate Recruitment and Internship Advisor*
 780 492 8641 • afns.grad@ualberta.ca



Dr. Baljit Ghotra:
Dream job for food scientist

Dr. Baljit Ghotra loves his job as a research scientist with National Starch LLC, the leading global supplier of specialty starches. He works in the Natural Polymer Group at company headquarters in New Jersey. “Top scientists from all over the world work here. The facilities are exceptional.” Dr. Ghotra says it was his PhD degree from U of A – which involved internationally recognized original research, development of new technology and its commercialization – that got him an interview at National Starch. For his PhD, Dr. Ghotra worked with AFNS Professors Drs. Thava Vasathan and Feral Temelli. They developed a technology for concentrating cholesterol-lowering fibre from oats and barley, and spun this off into Cevena Bioproducts. Even before he graduated in 2006, Dr. Ghotra had started working for Cevena. “To be involved in science-based discovery and its commercialization as a student was a unique opportunity. I’ll never forget my time at U of A.”

Students get hands-on tour of Cuban agriculture

In February 2010, 17 students accompanied by AFNS Professor Dr. Jane King and Gloria Martin from the Nova Scotia Agricultural College traveled to Cuba to take part in a unique Agro-Ecology Tour. The group visited farms, parks and gardens, to study how Cuban agriculture has been transformed since the collapse of the Soviet Union and the imposition of the U.S. trade embargo.

One of the highlights of the trip was a visit to an experimental “organopónico” or urban farm in the city of Ceinfuegos. This farm is part of a larger effort to increase food sustainability by producing food in or close to the cities. Throughout the trip, students practiced community service at each site – helping with weeding, planting, pot filling, feeding the animals and whitewashing buildings.

Several students described the trip as a “life changing”. Crop Science student Russell Shuttleworth commented that “For the first couple of days I was looking at Cuban agriculture from a Canadian perspective. By day three I was looking at Canadian agriculture from a Cuban perspective.”

Dr. Jane King
780 492 4750 • jane.king@ualberta.ca



Composting expertise is basis for new international collaboration

AFNS is front and centre in developing new links between the University of Alberta and Tianjin Agricultural University in China. Tianjin, China’s sixth largest city, has become increasingly important to the economy of the country.

The Faculty of Agricultural, Life & Environmental Sciences and Tianjin Agricultural University are exploring opportunities for collaboration in research and graduate and undergraduate education. To capitalize on the potential, AFNS Professor Dr. Jerry Leonard, who heads the Edmonton Waste Management Centre of Excellence, and Post-Doctoral Fellow Dr. Shouhai Yu visited Tianjin in October 2009. They forged collaborative links with both Tianjin Agricultural University and the Tianjin Institute of Agricultural Resources and Environmental Science.

“Composting of waste is of particular interest in the Tianjin area,” explains Dr. Yu. “Waste generation is increasing, and there is no effective way in place to deal with it. Composting can minimize pollution and the compost can be used to improve soil condition, which is crucial for sustainable agriculture.”

A composting demonstration project is now underway in Tianjin, supported by the University of Alberta’s China Institute. “Projects like this are the foundation for long-term collaboration, academic exchanges, and the recruitment of graduate and undergraduate students,” says Dr. Ellen Macdonald, Associate Dean (Research).

Dr. Jeremy Leonard
jeremy.leonard@ualberta.ca



L to R: Sophia Lin (Tianjin Agricultural Service Centre), Mr. Shen Xin (Vice Director of the Tianjin Rural Affairs Commission) and Dr. Jeremy Leonard



Dr. Anna Farmer and
Dr. Diana Mager

Consumers need “salt education”

Canadians know that too much salt isn't good for their diets, but many of us are not doing much about it. That's one of the findings from a study led by principal investigator AFNS and Centre for Health Promotion Studies Assistant Professor Dr. Anna Farmer and co-investigator AFNS Assistant Professor Dr. Diana Mager. The research was funded by the Canadian Foundation for Dietetic Research and the BC Ministry of Healthy Living and Sport.

In a survey of 890 people measuring knowledge and behaviours regarding sodium intake, the research team discovered that the majority of Canadians believe they consume too much sodium and that most are aware that too much sodium can lead to health problems. But only half are actually doing something about it. “The issue is important because more than one million Canadians currently have high blood pressure caused by excess sodium in their diets,” explains Dr. Farmer. “Since one of the major sources of sodium in our diet is processed foods, consumers should compare the sodium content of foods given the wide variability among brands.”

The survey results also highlight a need for better information about sodium targeted at young people. Those between the ages of 18 and 24 are the least



likely to read food labels for sodium content, and 50 per cent of them did not know whether Canadians were consuming too much sodium. “The nutrition facts label is our best source for sodium information, but most consumers are not using it because it is confusing and they are not sure of how to use the label information,” adds Dr. Farmer.

Dr. Farmer plans to continue her sodium research by studying the impact of the public's use and understanding of food labels and how this influences decision making about food choices that contribute to higher sodium intake and sodium intake during pregnancy.

Dr. Anna Farmer
780 492 2693 • anna.farmer@ualberta.ca

Dr. Diana Mager
780 492 7687 • diana.mager@ualberta.ca

The **AFNS Outstanding Achievement Awards** to our support staff

L to R: Victor Manolii, Jody Forslund, Dr. Feral Temelli, Susan Gibson, Jennifer Patterson and Jean Bourgois



Outstanding Support for Research Activities

(South Campus):

Jennifer Patterson

Jennifer Patterson’s job title is Research Coordinator for the Swine Reproduction and Development Program, but Dr. George Foxcroft, Director of the Swine Research and Technology Centre, calls her his “right-hand woman.” Jennifer manages all of the animal work at the Centre. She allocates animals to research trials, analyzes data, trains grad students, produces technical publications, and makes presentations to industry. Her expertise is indispensable.

Susan’s help directly because she is intuitively there to graciously lend a hand even before you realize you need help.” Susan also goes the extra mile for students, offering practical suggestions on projects and ensuring the efficient delivery of lab material.

Outstanding Support for Research Activities

(North Campus):

Victor Manolii

When it comes to solving problems, technician Victor Manolii is the “go-to guy” for the plant pathology group. Outside the lab, one of Victor’s duties is an annual survey for clubroot disease of canola, which requires him to visit hundreds of fields in rural Alberta. These surveys have made Victor a very familiar face among county agricultural personnel, industry and grower groups, and farmers. He is a great ambassador for AFNS and the University of Alberta.

Outstanding Support for Administration:

Jody Forslund

If there’s one person graduate students rely on, it is Jody Forslund. As coordinator of graduate programs, she does whatever she can to help make their experience in AFNS a positive one. She ensures that students are treated fairly and receive the guidance they need. Without Jody’s help in facilitating the routine requirements of graduate programs, our research programs would not be nearly as successful.

Outstanding Support for Teaching:

Susan Gibson

As coordinator for the teaching of food labs, Susan Gibson is known for being proactive. As one nominator wrote, “I feel that nobody ever actually asks for

Outstanding AFNS “booster”

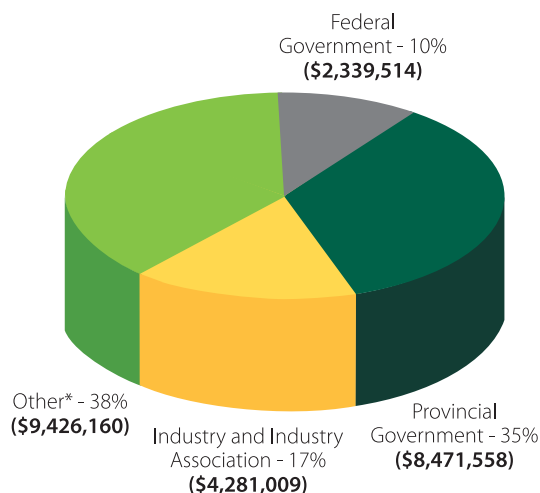
(champion of overall activities)

Jean Bourgois

After 35 years of supporting teaching and research at AFNS, technologist Jean Bourgois is retiring. He has been a key support person in the department. Without his expertise and effort, the food engineering component of the NUFSP program could not have been conducted. Over the years, undergraduate and graduate students, technicians and professors have turned to Jean for help with a wide variety of equipment. In 2006, Jean was transferred to AFDP and he has been pivotal in getting the facility up and running. He will be missed!

Research Funding

\$24,518,241



*Non-Profit, Research Endowment and other Government

Graduate Student Enrolment

Masters	138
Doctoral	105
Visiting	7
Total	250

76 New graduate students started in 2009/10

53 Graduate students convocated in 2009/10

Central Laboratories include

- Agri-Food Materials Science Unit
- Agricultural Genomics & Proteomics Unit
- Food Science facilities
- Nutrition & Metabolism facilities
- Human Nutrition Research facilities
- Plant Growth facilities

Operating Budget

\$9,252,951

Distribution of Operating Budget

- 58% Academic & Teaching Support
- 11% Administrative & Computing Support
- 9% Central Laboratories
- 22% Research Stations

Academic Staff

68	Professors
32	Adjunct Professor
47	Postdoctoral Fellows
29	Research Associates
13	Visiting Scientists

391 Refereed publications

543 Extension publications/presentations

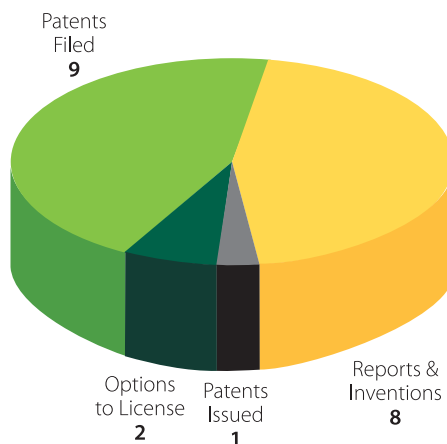
Undergraduates enrolled in degree programs

BSc Agriculture (includes Pre-Vet Medicine)	244
BSc Agricultural/Food Business Management	35
BSc Nutrition & Food Science	578
BSc Animal Health	23
Total	880

Off-campus Research Facilities include

- Edmonton Research Station
 - Agri-Food Discovery Place
 - Alberta Poultry Research Centre
 - Crops & Land Resources Unit
 - Dairy Research & Technology Centre
 - Land W McElroy Metabolism & Environment Research Unit
 - Swine Research & Technology Centre
 - Enclosed Composting Facility
 - Feedmill
- Ministik Field Station
- University of Alberta Kinsella Research Ranch
- St. Albert Research Station

Technology Transfer



professors

Dr. Judd Aiken
Prion Disease

Dr. Burim Ametaj
Ruminant Nutritional Immunology

Dr. Daniel Barreda
Immunology

Dr. Rhonda Bell
Human Nutrition

Dr. Miodrag (Mike) Belosevic
Comparative Immunology and Infectious Diseases

Dr. David Bressler
Fermentation & Bio/Food Engineering

Dr. Heather Bruce
Carcass & Meat Science

Dr. Linda Casey
Pediatric Nutrition

Dr. Jonathan Curtis
Lipids, Analytical Chemistry

Dr. Walter Dixon
Molecular Biology

Dr. Lloyd Dossdall
Agricultural Entomology

Dr. Carolyn Fitzsimmons
Beef Genomics

Dr. George Foxcroft
Swine Reproductive Physiology

Dr. Michael Gänzle
Microbiology & Probiotics

Dr. René Jacobs
Human Nutrition

Dr. Nat Kav
Biochemistry & Biotechnology

Dr. Johh Kennelly
Dairy Cattle Nutrition & Metabolism

Dr. Marleny Aranda Saldana
Food/Bio Engineering Processing

Dr. Lorne Babiuk
Virology & Infectious Diseases

Dr. Ronald Ball
Swine and Human Nutrition

Dr. Mirko Betti
Muscle Food Chemistry & Processing

Dr. Peter Blenis
Forest Pathology

Dr. Edward Bork
Rangeland Ecology & Management

Dr. Cathy Chan
Human Nutrition

Dr. Lingyun Chen
Plant Protein Chemistry and Technology

Dr. Tom Clandinin
Human Nutrition

Dr. Michael Dyck
Reproductive Physiology/Biotechnology

Dr. Anna Farmer
Community Nutrition

Dr. Catherine Field
Nutrition and Metabolism

Dr. Leluo Guan
Functional Genomics & Microbiology

Dr. Linda Hall
Environ. Biosafety & Integrated Weed Management

Dr. Robert Hudson
Wildlife Production/Management

Dr. Jane King
Physiology of Forage Crops

Dr. Douglas Korver
Poultry Nutrition

Dr. Diana Mager
Clinical Nutrition

Dr. Vera Mazurak
Nutrition & Metabolism

Dr. Linda McCargar
Clinical Nutrition

Dr. M. Anne Naeth
Applied Ecology, Land Reclamation & Restoration Ecology

Dr. Masahito Oba
Dairy Nutrition and Physiology

Dr. Erasmus Okine
Ruminant Nutrition and Metabolism

Dr. Habibur Rahman
Canola Breeding & Research

Dr. Robert Renema
Value-Added Poultry Science

Dr. Frank Robinson
Poultry Management/Physiology

Dr. Stephen Strelkov
Plant Pathology

Dr. Feral Temelli
Food Process Engineering

Dr. Thavaratnam Vasanthan
Grain Science & Technology

Dr. Christian Willenborg
Field Crop Agronomy and Weed Science

Dr. Noreen Willows
Community Nutrition

Dr. Wendy Wismer
Sensory & Consumer Science

Dr. Ruurd Zijlstra
Ingredient Evaluation & Carbohydrate Nutrition

Dr. Martin Zuidhof
Poultry Science, Bioeconomic Modeling

Dr. Jerry Leonard
Bioresource Engineering

Dr. Changxi Li
Bovine Genomics

Dr. Tom McFadden
Dairy Science

Dr. Lynn McMullen
Food Microbiology

Dr. Stephen Moore
Bovine Genomics

Dr. Jocelyn Ozga
Plant Physiology & Horticultural Science

Dr. Lech Ozimek
Dairy Processing Technology & Food Product Development

Dr. Spencer Proctor
Metabolic and Cardiovascular Diseases

Dr. Andreas Schieber
Functional Foods and Nutraceuticals

Dr. Dean Spaner
Plant Breeding/Organic Agriculture

Dr. Paul Stothard
Bioinformatics

Dr. Donna Vine
Human Nutrition

Dr. Zhiquan Wang
Beef Quantitative/Statistical Genetics

Dr. Randall Weselake
Agricultural Lipid Biotechnology

Dr. David Wright
Human Nutrition

Dr. Jianping Wu
Food Protein Chemistry

Dr. Rong-Cai Yang
Statistical Genomics and Quantitative Genetics





DEPARTMENT OF
**AGRICULTURAL, FOOD
& NUTRITIONAL SCIENCE**
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