

2008 ANNUAL REPORT



Our  
knowledge  
is your  
Advantage





1957 BROILER



1977 BROILER



2005 BROILER

## 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

## Daring to Make a World of Difference!

The breadth, scope and excellence of the work conducted in the Department of Agricultural, Food and Nutritional Science, whether through research, teaching or service, continued to impress and inspire in 2008-09.

Indeed, the Department more than lives up to the Faculty's new motto – 'Dare to Make a World of Difference'. Cattle researchers have developed and patented genetic tests to predict the potential of livestock. Research on prion proteins may one day lead to the development of new therapies for diseases such as mad cow disease and chronic wasting disease. Plant scientists are breeding canola they believe is resistant to the rapeseed's latest threat, clubroot disease. Bio-refining researchers are extracting high-value foods and nutraceuticals from crops. Research is underway on the role of diet in the increasing rates of liver disease in children.

The Department has also worked hard to create a dynamic learning environment, as recognized by the many teaching awards won by faculty and the increased funding for innovative programs such as the dietetic internship. Community engagement remains a top priority, as evidenced by the wide offering of technical seminars, school programs and community events.

Research, teaching and service – they are all key to the Department's success and part of the solid base that enables the Faculty to make a difference in the lives of people around the world.

### **Dr. John Kennelly – Dean**

*Faculty of Agricultural, Life & Environmental Sciences (ALES)*  
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## **BUILDING A GREAT DEPARTMENT**

Inspired by the cornerstones from the Dare to Discover vision for the University of Alberta (Discovery Learning, Incubating Scholarship, Community Engagement and Building the Transformative Organization), AFNS is working in all four areas to strengthen and grow our Department.

One priority is attracting and retaining talented people who foster a culture of excellence. This past year, we filled key scientific positions including a Canada Research Chair in Functional Foods, and an Ingenuity Scholar who is also Director of the Alberta Veterinary Research Institute. Several of our new positions are in partnership with the provincial and federal governments. We are also attracting more graduate students, now numbering 234, and the demographics have changed with 37% being international students (up from 28% in 2007). Notably, many of our students win significant scholarships and attain excellent placements after graduation.

We are delivering an exceptional university experience through excellence in learning, discovery and citizenship in all our programs. For example, we will continue to ensure that our Nutrition and Food Science program has adequate resources to maintain its reputation for excellence. There is also great anticipation as we prepare to deliver a new Bachelor of Science Animal Health Degree.

Connecting to our external communities is a long-standing AFNS tradition, whether our partners are alumni, cities and towns, business and industry, or educational and research institutions. We continue to develop our partnership with the University of Calgary in the training of veterinary students. Other partnerships are in expansion mode including those with Alberta Health Services (Integrated Dietetic Internship), Olds College, Alberta Agriculture and Rural Development, and Agriculture and Agri-Food Canada.

The university-wide initiative of building a transformative organization has translated into numerous actions within our Department. The generous land donation from the Bocock family made the headlines and I was thrilled by the recognition of this gift. The Department is also hard at work on other infrastructure initiatives including the integration of the Kinsella properties and enhancing the functionality of Agri-Food Discovery Place.

The work accomplished over the past year is a strong foundation from which to grow and prosper. I look forward to working with all our partners as we continue to build a great Department.

### **Dr. Erasmus Okine – Chair**

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## RESEARCH FOCUSES ON SHAPE-SHIFTING PRION PROTEINS

An AFNS researcher is a member of one of four U of A teams to win a share of \$1.9 million in funding from PrioNet Canada. Associate Professor Dr. Nat Kav is working with the U of A's Dr. Michael James on a project studying the prion protein.



Dr. Nat Kav and Bo Yang (student)

Prion diseases occur when a normal protein is misshapen into a disease-causing form called a prion. Prion diseases are untreatable, infectious, and fatal. They include bovine spongiform encephalopathy (BSE or mad cow disease), Creutzfeldt-Jakob disease in humans, and chronic wasting disease in deer and elk.

The team's approach is to use x-ray crystallography and other methods to determine the shape of the prion protein. Certain antibodies are vital to this work because they bind to the prion protein, "freezing" it so the researchers can look at it. A key collaborator is Professor Adriano Aguzzi, University Hospital, Zurich,

Switzerland, who is contributing the antibodies.

"The information from the antibodies binding with the protein is critical – there is still much that is not known about the shape of the protein," explains Dr. Kav. "We hope this will translate into better knowledge on how these proteins shape-shift and may one day lead to the development of new therapies for prion diseases."

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Dr. Randall Weselake



Dr. Stephen Moore

## UNDERSTANDING GENOMICS IS KEY TO PREDICTING ANIMAL PERFORMANCE

AFNS Professor Dr. Stephen Moore's research in bovine genomics is focused on identifying the genes and gene pathways that result in traits such as yield, fat content and milk quality. His state-of-the-art lab is on the leading edge of this work. "If we can predict these traits in animals at a young age, we can breed for specific traits or manage animals to maximize the potential." To extend this research, Dr. Moore has submitted a proposal to Alberta Ingenuity for a research centre for Livestock Genomics Technology.

### Stephen Moore

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## RESEARCH ON OIL PRODUCTION YIELDS RESULTS FOR INDUSTRY AND HEALTH

"Having a fundamental understanding of oil formation in plants opens the door to being able to modify oil formation," says AFNS Professor Dr. Randall Weselake. "This is important work because the future economy of Canada will be increasingly based on renewable resources." His team is at the forefront, exploring how plants can provide a sustainable source of oils for better nutrition and industrial applications, such as biofuel and biolubricants, as well as enhancing seed oil content for both purposes. Dr. Weselake has submitted a proposal to Alberta Ingenuity for a research centre for Performance Oilseeds and Bioactive Oils.

### Randall Weselake

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## AGRI-FOOD DISCOVERY PLACE

### SIMPLY THE BEST

AFNS Professor Dr. Lynn McMullen calls her lab at Agri-Food Discovery Place “a playhouse where I get to work.” Her delight stems from the fact that her workspace is much more than a lab – it is a level 2 biocontainment facility, which allows her team to work with disease-causing organisms under conditions that replicate a meat processing plant. No other research centre has such a complete suite of processing facilities. The focus of Dr. McMullen’s research is meat safety, in particular the control of food-borne pathogens that cause diseases such as botulism, listeriosis and gastroenteritis. “Having the proper facilities is essential to this work because our results must be relevant to the meat industry,” she says.

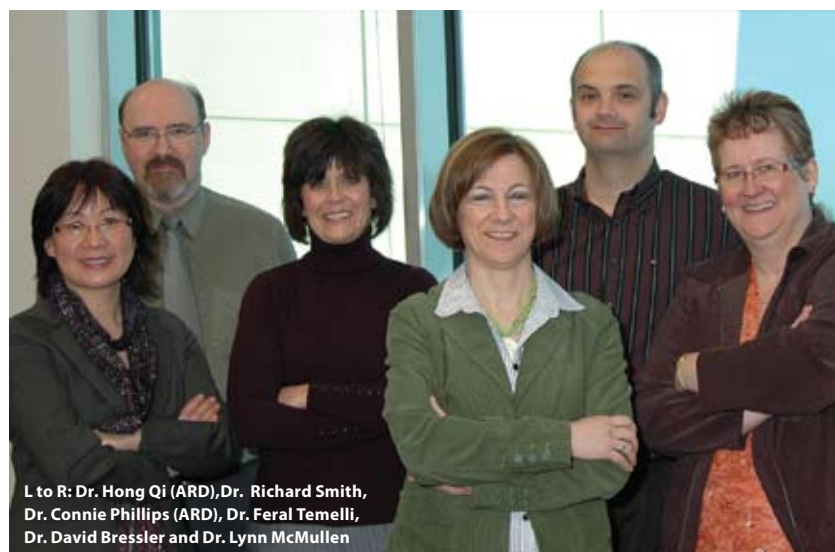
The \$25-million Agri-Food Discovery Place (AFDP), which opened in 2008 on south campus, supports three main research areas: meat safety, crop use for food, and crop use for industrial products. “We are the step between scale-up and commercialization,” explains AFNS Associate Professor Dr. David Bressler, who chairs the AFDP Management Committee. “Pilot facilities such as this are absolutely critical to successful commercialization.” Importantly, the Bio-industrial Technologies Division of Alberta Agriculture and Rural Development is co-located at AFDP, providing key engineering and scale-up support to researchers.

AFNS Professor Dr. Feral Temelli has moved her supercritical technology processing program to AFDP. This technology uses carbon dioxide to extract and fractionate high-value ingredients from crops. Under high pressure and just above ambient temperatures, carbon dioxide acts like an organic solvent but does not leave any residues, making it invaluable for the manufacture of natural products and nutraceuticals. “Our lab is unique in Canada, allowing us to do state-of-the-art research and expand our expertise,” says Dr. Temelli. “As a result, we run one of the top programs in the world.”

#### Richard Smith

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L to R: Dr. Hong Qi (ARD), Dr. Richard Smith, Dr. Connie Phillips (ARD), Dr. Feral Temelli, Dr. David Bressler and Dr. Lynn McMullen

### BOOST FOR BIOREFINING

As interest in biorefining surges around the world, the University of Alberta and Olds College are joining forces to capitalize on their strengths in this area. Biorefining uses renewable biomass materials as the feedstock to produce high-value products for food or industrial use. In an agreement with the U of A, the Olds College School of Innovation will move its biorefining equipment and programs to Agri-Food Discovery Place (AFDP), which has complementary biorefining pilot facilities. “There’s been a long-standing relationship between Olds College and the U of A, based on a number of small projects between individuals at both institutions,” notes Dr. David Bressler. “This is a strategic effort to consolidate our strengths. We are adding to the versatility of AFDP and building capacity in Alberta in biorefining.”



Dr. Lynn McMullen



Dr. Feral Temelli



Dr. David Bressler





Dr. Diana Mager



## FOCUS ON LIVER HEALTH

Asked about the risks of excess weight and inactivity, most of us would identify cardiovascular disease or Type 2 diabetes. Liver disease would not likely make the list.

And yet liver disease is a serious risk even for children, notes AFNS Assistant Professor Dr. Diana Mager, who is also Program Manager, Research, Nutrition Service, Alberta Health Services. It's estimated that 10 to 25 per cent of children who are overweight or obese have non-alcoholic fatty liver disease (NAFLD). "This is serious because if left unchecked, NAFLD can lead to cirrhosis. Liver cirrhosis is one of the leading reasons why adults need a liver transplant," says Dr. Mager.

Although the mainstay of treatment for NAFLD is weight loss, no one is completely sure what is the best way to promote this. Dr. Mager's research is focused on understanding how diet links to the underlying disease mechanisms of NAFLD. Understanding the way diet influences underlying disease processes can help us understand how diet can be used to help in the treatment of a disease. "Current research indicates that bigger portion sizes and the increased consumption of foods high in fat, sucrose/fructose, and refined carbohydrates are likely contributors," she says. "With childhood obesity almost tripling in Canada over the past 30 years, the take-home message is that children need to eat a well-balanced, healthy diet and participate in fun physical activity on a consistent basis. It's absolutely vital."

### Diana Mager

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## PARTNERSHIPS BOOST DIETETIC INTERNSHIP

An enhanced partnership between the Department of Agricultural, Food and Nutritional Science, the College of Dietitians of Alberta, and Alberta Health Services has paved the way to meet the growing demand for registered dietitians in Alberta.

"Current labour market estimates suggest that the need for registered dietitians will skyrocket in the coming decade. Forging stronger linkages between AFNS, the College of Dietitians of Alberta, and Alberta Health Services has allowed us to respond to this need and support the nutritional health of Albertans in the process," says Heidi Bates, Director of the University of Alberta Integrated Dietetic Internship Program.

AFNS has worked with Alberta Health Services (Edmonton, Calgary, and Palliser) to provide dietetic internship training opportunities for several years. Recent changes to the structure of the Internship have allowed this partnership to be enhanced; a change that will provide significantly more AFNS students with the opportunity to become registered dietitians.

"AFNS now offers more dietetic internship positions than any other institution in the country," says Bates. "This is an exciting time and we're working closely with our partners to maximize student training and meet the needs of Alberta's health care system."

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L to R: Heidi Bates, Maureen McKay, Anne Gilbert

## BOCOCK LAND DONATION



L to R: Jennifer Bocock, John Bocock, John Kennelly, Rachel Bocock, Bill Bocock, Phyllis Bocock

### GENEROUS LAND GIFT SECURES FUTURE FOR AGRICULTURAL RESEARCH

The largest gift of research land ever made to a Canadian university has given a huge boost to agricultural research at the University of Alberta. In June 2008, the Bocock family sold 777 acres to the University of Alberta at a fraction of the appraised value. This prime farmland, to be known as the St. Albert Research Station, will serve as a new hub of agricultural research. It secures the future of agricultural and environmental research in Alberta for decades to come.

"We're very pleased to make this gift to the University of Alberta," said Bill Bocock, speaking on behalf of the family. "This land has provided a wonderful livelihood for our family since our grandfather bought the original half section in 1921."

"This marks the beginning of a new century of discovery in agricultural and environmental research at the University of Alberta," said Dr. Indira Samarasekera, President of the University. "This gift, and the extraordinary generosity behind it, richly enhances our learning institution as it adds to our ability to teach and brings our research capacity to a new level."

The St. Albert Research Station will host a variety of crop research projects and provide the university with the ability to grow and expand. Two research crops were planted in 2008 and more are planned as activities wind down at the Ellerslie Research Station. Some of the current activity at the Edmonton Research Station may also be moved to the St. Albert Research Station.

In recognition of this historic gift, the university established the Bocock Chair in Agriculture and Environment. The chair will study the interactions between agriculture and the environment using interdisciplinary approaches to seek a balance between sustainable food and bio-products production, economic viability and environmental health.



**Alberta  
Poultry  
Research  
Centre**

### PRC TEAM WINS INTERNATIONAL ACCOLADES

At the Poultry Science Association's centennial meeting, Niagara Falls, Ontario, in July 2008, the Poultry Research Centre crew and graduates from AFNS took centre stage in front of an international audience.

- **Dr. Frank Robinson** was named a Fellow of the Poultry Science Association, one of the highest distinctions a PSA member can achieve.
- **Dr. Doug Korver** received the American Feed Industry Association Poultry Nutrition Research Award for distinctive work demonstrating sound research in poultry nutrition.
- **Dr. Martin Zuidhof** was recognized by the National Chicken Council Broiler Research Award for distinctive research work that has a strong economic impact on the broiler industry.
- **Mrs. Felicity Dennis** received the Tyson Foods Support Personnel Award to acknowledge her long-term role in assisting faculty in poultry research.

A number of former and current graduate students also won awards:

- **Mr. Lukas Kawalilak**, PSA Student Research Paper Certification of Excellence
- **Mr. Mojtaba Yegani**, winner of the PSA Student Essay Competition
- **Ms. Victoria Sikur**, PSA Early Achievement Award from the Poultry Industry
- **Dr. Gita Cherian**, research manuscript recognized by the American Egg Board Research Award

### DISTINGUISHED SERVICE AWARD FOR RON BALL

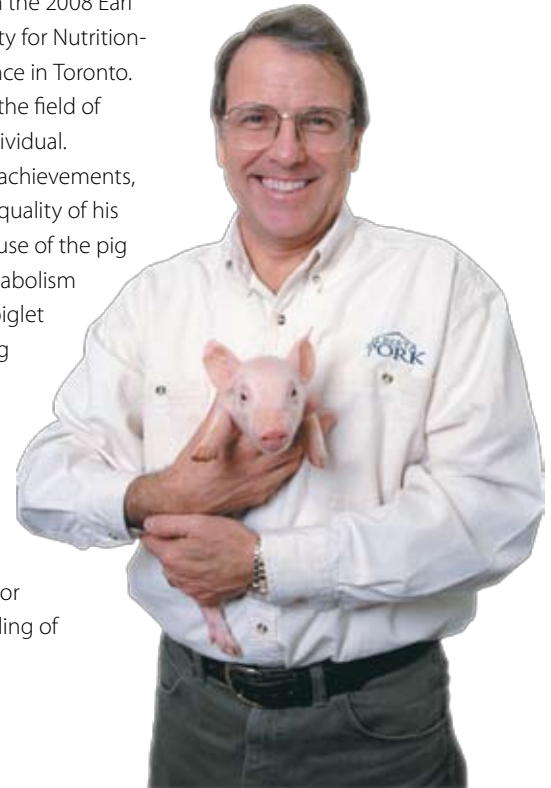
AFNS Professor Dr. Ron Ball was presented with the 2008 Earl Willard McHenry Award by the Canadian Society for Nutritional Sciences (CSNS) at the CSNS annual conference in Toronto. The award recognizes distinguished service in the field of nutrition by a Canadian or Canadian-based individual.

Dr. Ball's nomination highlighted numerous achievements, focussing on both his leadership and the high quality of his research. Dr. Ball is a leading proponent of the use of the pig as an animal model for human amino acid metabolism and requirements. When he began using the piglet model in the early 1980s it was rare to find a pig research paper presented at major biology or nutrition conferences. Today, many scientists are using the pig as a model for human nutrition and metabolism research.

His laboratory has also demonstrated that the small intestine plays a major role in amino acid metabolism. These observations have major implications for the enteral and parenteral feeding of human premature babies.

#### Ron Ball

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Dr. Ron Ball

### TWO MAJOR AWARDS FOR DAVID WRIGHT

AFNS Assistant Professor Dr. David Wright recorded major funding success in 2008, receiving the Canadian Diabetes Association (CDA) Scholar Research Award as well as the Canadian Institutes of Health Research (CIHR) New Investigator Research Award.

The CDA Scholar Award provides salary support for newly independent investigators establishing their own diabetes-related research at a Canadian university or research institute. The CIHR New Investigator Award contributes to the salary of new investigators so they can initiate and conduct health research.

Dr. Wright's research is focused on understanding the mechanisms regulating fuel metabolism in skeletal muscle and fat tissue. In particular, he is interested in the biochemical mechanisms through which diet and exercise regulate fuel metabolism in these tissues. Recent research suggests that reductions in mitochondria, the energy-producing powerhouses of the cell, in fat tissue could be involved in the development of type II diabetes. The findings from his studies have direct implications in the treatment and prevention of obesity and type II diabetes.

#### David Wright

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Dr. David Wright



## BUSINESS AS USUAL FOR “RETIRED” PROFESSOR

Asked about his so-called retirement from AFNS in 2005, Dr. Tapan Basu notes that his life really hasn't changed. "Like many academics, I never took up a serious hobby. I get pleasure from my profession and that's what I've kept on doing."

Dr. Basu has continued to teach, write, review papers, consult, and work with the International College of Nutrition as their executive director, among other things. "And my family keeps encouraging me to do more exercise," he adds.

As a consultant, Dr. Basu maintains his long-standing relationship with CV Technologies, the makers of the natural cold remedy COLD-FX. Dr. Basu goes to CVT every Friday to meet with researchers. "The company is extending their focus to metabolic syndrome, which draws on my expertise in metabolic diseases. I'm excited to be part of this research."



Dr. Tapan Basu



Dr. Chuji Hiruki

## CAMELLIA INSPIRES ECONOMIC DEVELOPMENT

When he retired from AFNS in 1996, Dr. Chuji Hiruki returned to his birthplace in Japan's Goto Islands to look after his elderly parents. It was a time of contemplation, which ultimately sparked a new idea. "The economy was not doing well. With my background in agriculture and environmental protection, I wondered what could be done."

Dr. Hiruki found his inspiration in the camellia tree, which the Goto Islands are famous for. Seed from the fruit are pressed into oil that is used in cosmetics, cooking and lubrication. The islanders have embarked on a long-term plan to plant 5 million camellia trees.

Now that local people are running the program, Dr. Hiruki is back at U of A more often. "I spend half my time volunteering, half my time in research. It's a good balance."

## FROM ACADEMIA TO INDUSTRY

Dr. Mike Stiles always knew what he'd be doing in retirement – he just didn't think he'd be doing it for as long as he has. When he retired from AFNS in 2000, Dr. Stiles became CEO of CanBiocin, the U of A spin-off company he co-founded with Drs. Lynn McMullen and John Vederas.

"I envisioned that this project would be at a different stage now, but getting cash flow took longer than we thought. No matter, I have enjoyed it all. It's great to see a commercial application coming along."

CanBiocin's technologies are based on the application of lactic acid bacteria to enhance food safety through prevention of foodborne disease. Its Micocin® product has approval in the U.S. for addition to processed meat products. Approval for use in Canada is expected this year.



Dr. Mike Stiles



Dr. Derek Haley

### GETTING OUT OF THE IVORY TOWER

“There’s a great tradition of commitment to animal care on the prairies,” says AFNS Assistant Professor Dr. Derek Haley. “For example, the Alberta Farm Animal Care (AFAC) is an industry association dedicated to animal welfare. Given this environment, we have an opportunity to expose our students who study animal behaviour and animal welfare to industry perspectives as well.”

That’s exactly what Dr. Haley has done. Along with Dr. Craig Wilkinson (the Faculty’s Director of Animal Care), they asked their students in Animal Science 376 if they wanted to extend their learning after the course was finished. The idea was to take a field trip to the AFAC’s Livestock Care Conference in April 2008 in Red Deer. Six students attended the conference as well as a pre-conference meeting and post-conference debriefing. Drs. Haley and Wilkinson plan to offer the same opportunity next year.

“There’s growing consumer interest in food quality, including the ‘ethical quality’ of food such as whether farmers are using humane methods of handling and housing animals,” says Dr. Haley. “It’s no surprise that students are mirroring that interest.”

**Derek Haley**

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Most recent Nutr 440 Course participants: l-r Ashley Cattell, Chantale Tippett, Mehek Mathur, Selene Yan, Vicky Lau, Anne Gilbert

### EARLY LESSON IN SHARING RESEARCH RESULTS

On the face of it, the June 2008 symposium “The Century to Change Diabetes” looked like any other conference. But this one was different – it was organized and run by the students in AFNS Professor Dr. Linda McCargar’s Nutrition 440 class. “Fundraising, programming, public relations, hospitality, exhibits – students get a real-life experience in organizing a professional conference.”

This is the fourth year that the innovative course has been offered; the first two years were taught by AFNS Professor Tom Clandinin. The 2008 symposium featured a variety of guest speakers on diabetes and attracted about 400 people. A morning poster session was held in conjunction with the symposium, where students from Nutrition 401 presented the findings from

their research projects.

“This is an effective way to get across the idea that research findings should be shared,” says Dr. McCargar. “The poster session teaches students how to talk about their own research. The symposium is an opportunity to understand results from other researchers and to discuss and ask questions. We often talk about the importance of research dissemination, but you can’t beat hands-on experience.”

**Linda McCargar**

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### IT WAS A FARM AND FOOD EXTRAVAGANZA!

More than 1,500 people attended Food & U Day, a two-day event held in June 2008 that provided an opportunity for people to learn about, see and touch different foods, animals and crops at the Edmonton Research Station.

There were 12 interactive stations, including ones with interactive food science, nutrition and plant science displays, as well as dairy cattle, pigs, chickens, companion animals such as dogs, cats, ferrets and various reptiles. All the stations hosted different experiments, games and displays.

For example, in one station, people learned how different tastes and smells are produced and then played a trivia game about what they learned. In the dairy barn, people saw a cow being milked and different products made from milk. In the poultry hatchery, they were able to pet young chicks.

School children from the Edmonton area were invited the first day of the event, while the community at large was invited to attend on the second day.



### BANFF PORK SEMINAR (BPS)

Now in its 38th year, the Banff Pork Seminar (BPS) is a technology transfer meeting for the pork industry that has been jointly organized by AFNS, Alberta Pork and Alberta Agriculture & Rural Development (and their predecessors). Past Program Directors, Roy Berg, Frank Aherne, George Foxcroft and Ron Ball, from the Departments of Animal Science and AFNS, have attracted exemplary speakers and helped to build the international reputation of the Seminar.

Offering a view to the future in its plenary sessions and practical “take home” information in its breakout sessions, the Banff Pork Seminar, coordinated by Ruth Ball, regularly attracts 800 delegates from all across Canada, the USA, Europe and Asia. Attendees represent all aspects of pork production and every large pork organization and business is well represented. The Banff Pork Seminar is now one of the premier pork seminars in North America.

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Ruth Ball and  
Joanne Morrison

### WESTERN CANADIAN DAIRY SEMINAR (WCDS)

Acknowledged as the top seminar of its kind in North America, the dairy industry looks to the Western Canadian Dairy Seminar (WCDS) for solutions to emerging issues, and for information about recent research results that will be of benefit to dairy producers and other stakeholders in the dairy industry. Of the almost 700 delegates at the 26th WCDS in 2008 45% were progressive producers, primarily from Western Canada, and 45% were from industry all over North America. This group was comprised of feed, pharmaceutical, equipment, veterinary and financial industries pertaining to dairy. The Seminar which has an Advisory Committee of university, government and industry representatives has been coordinated by Joanne Morrison since 1999.

The Seminar addresses issues on dairy policy, animal health and productivity, nutrition, genetics, reproduction, and housing and cow welfare. In addition to the formal program, the seminar offers ample opportunity for participants to have informal discussions with the speakers and with industry service representatives. A trade show of 65 booths enables the sponsors to exhibit their products.

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Dr. Judd Aiken

**JUDD AIKEN:  
AN OPPORTUNITY  
NOT TO BE MISSED**

After 22 years at the University of Wisconsin, Dr. Judd Aiken relocated his research program to AFNS in 2008. “A major factor for the move was the research environment at the U of A,” says Dr. Aiken, who is an Alberta Ingenuity Scholar as well as Director of the Alberta Veterinary Research Institute. “It is fantastic being with so many prominent prion disease researchers including Drs. David Westaway, Val Sim, Debbie McKenzie and Ted Allison.

As well, the Centre for Prions and Protein Folding Diseases is a state-of-the-art facility. This was an opportunity I didn’t want to miss.”

Prion diseases are a major research interest of Dr. Aiken’s, his other is mitochondrial genetic mutations in age-related pathologies. His prion research focuses on Chronic Wasting Disease (CWD), a transmissible neurological disease of deer and elk that is similar to mad cow disease in cattle. CWD poses serious problems for wildlife managers, and the implications for free-ranging deer and elk are significant.

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Dr. Christian Willenborg

**CHRISTIAN WILLENBORG:  
GOOD ADVICE**

Although he came from a farming family, Dr. Christian Willenborg was encouraged to go to university rather than work. As one family friend told him, “You have a better brain than hands.” Willenborg, who recently defended his PhD thesis at the University of Manitoba, is the new ARD Assistant Professor at AFNS. His research is in field crop agronomy and weed science; his overarching goal is to optimize weed management in agricultural systems. “In the last five years consumers have become more demanding about where, when and how their food is produced. I see a changing paradigm where we’re going to need more sustainable methods of weed control to meet consumer demands.”

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Dr. Carolyn Fitzsimmons

**CAROLYN FITZSIMMONS:  
TAKING THE LONG WAY**

Dr. Carolyn Fitzsimmons took the long way to Alberta from her home in Saskatchewan: from the University of Saskatchewan for her Bachelor and Master’s degrees, Iowa State University for two years of lab work, Uppsala University in Sweden for her PhD, and the University of Adelaide in Australia for her post-doctorial fellowship. Now she is an Agriculture and Agri-Food Research Scientist at AFNS. “I never imagined that my education would take me so far from home. But it is amazing how much you learn from these experiences.”

Dr. Fitzsimmons’ research in bovine genomics will focus on maternal nutrition and its effects on the unborn calf. A better understanding of maternal nutrition could lead to improved production via reduced variability in carcass quality.

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**MARTIN ZUIDHOF:**  
**A WONDERFUL RIDE**

A chance meeting in the hallway with AFNS Professor Dr. Frank Robinson led to a half-hour discussion, which in turn led to Dr. Martin Zuidhof doing his Master's and PhD degrees in AFNS. "I had done my undergraduate degree in biology. I wasn't really looking at agriculture but Frank convinced me otherwise. It's been a wonderful ride."

From his work at Alberta Agriculture and Rural Development from 1993 to 2008, first as poultry specialist and then as a research scientist, Dr. Zuidhof developed close links with the Poultry Research Centre. As an Associate Professor, his research will focus on bio-economic modelling, initially targeted to supporting complex industry decisions in the broiler chicken supply chain.

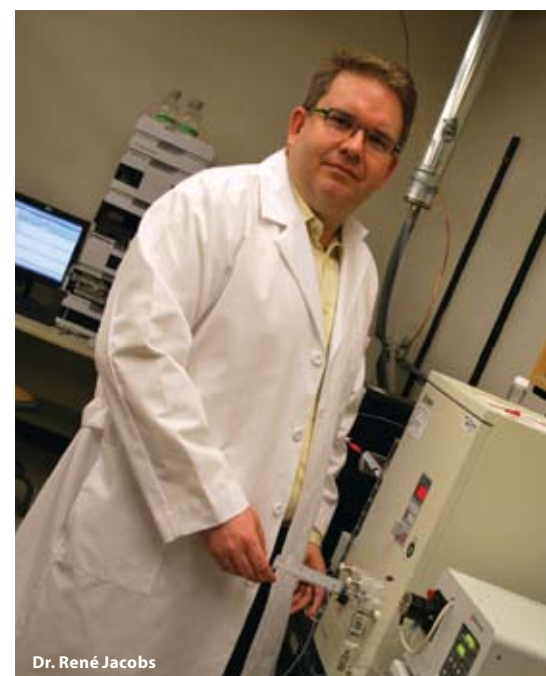
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**RENÉ JACOBS:**  
**LINKING BIOCHEMISTRY AND NUTRITION**

Although he is trained in biochemistry – with a PhD from Memorial University and post-doctoral work in biochemistry at U of A – Dr. René Jacobs has always been interested in the connections between nutrition, metabolism and biochemical processes. That's why he says that his new position as Assistant Professor in AFNS is "not a big jump."

Dr. Jacobs is studying the nutritional and genetic factors that impact the development of obesity, diabetes and inflammatory bowel disease. "Understanding normal physiology makes it easier to see how physiology is changed in the disease state. I'm hopeful that this knowledge will lead to new ways to prevent and treat these diseases."

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**LINDA CASEY:**  
**FAMILIAR FACE JOINS THE DEPARTMENT**

Given Dr. Linda Casey's long-standing links with AFNS, we can't really call her a "newcomer" to the department. Dr. Casey completed her Master's degree with AFNS Professor Dr. Tom Clandinin in 2001 and has been an adjunct professor since 2005. She is now formalizing her relationship with a cross appointment as an Assistant Professor in AFNS and the Department of Pediatrics (Faculty of Medicine). Dr. Casey is a pediatrician who specializes in pediatric nutrition.

"With a cross appointment, I can do more teaching in AFNS, develop some unique course work, and collaborate with a large pool of researchers with very diverse expertise in nutrition," says Dr. Casey. "This is a great opportunity."

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**MARC MCPHERSON:**  
**FARMING THE MOLECULAR WAY**

As an undergrad, Marc McPherson was set on a career in zoology. But it was the required botany courses that captured his interest. He went on to do graduate work with AFNS Associate Professor Dr. Linda Hall. His PhD was on the plant molecular farming of safflower.

“The experience I gained in Linda Hall’s lab was key to my success. She provided an amazing opportunity with her strong links to Alberta Agriculture and industry, and the access to expertise, technical support, and equipment.”

Shortly after Dr. McPherson graduated in June 2008, a friend found an online posting for a job at Monsanto which “read like an abstract of my PhD.” Dr. McPherson got the job and is now working on Monsanto’s next generation of canola products at the company’s Regulatory Environment Science Centre in St. Louis, Missouri.



Dr. Marc McPherson



Dr. Paul Moquin

**PAUL MOQUIN:**  
**BITTEN BY THE RESEARCH/LOVE BUG**

Research wasn’t on Paul Moquin’s radar until, as an AFNS undergrad, he participated in an IAESTE student exchange to Prague, Czech Republic. “I worked with graduate students at the Institute of Chemical Technology. The experience opened my eyes to the world of research.”

Dr. Moquin went on to finish his degrees at AFNS, working with Dr. Feral Temelli as his PhD supervisor. He is now Project Manager, Research & Development, at Ceapro Inc. This Edmonton-based company develops organic products for the personal care and cosmetic industries. “I’m the troubleshooter of the company and there’s never a dull moment in this science-based job. AFNS gave me the tools I need to understand the complexity of a natural substance.”

As a footnote, Dr. Moquin caught more than a “research bug” in the Czech Republic. He also met his wife, Dr. Kamila Moquin, who is now working with AFNS Professor Dr. Lynn McMullen.

**Janice Lokhorst**

Graduate Recruitment and Internship Coordinator  
 780 492 8641  
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**Did you know?**

*37% of AFNS’ Graduate Students are International Students. They hail from 26 different countries.*



**DANA PENRICE:**  
**CONNECTING CHILDREN**  
**WITH FOOD PRODUCTION**

As a summer student at AFNS, Dana Penrice worked with AFNS Professor Dr. Frank Robinson on the Heifer in Your Tank (HIYT) program. The program began in Dr. Robinson's Animal Science 200 class as a way to promote hands-on learning. It has evolved into an innovative way to spread agricultural awareness to students in grades 4-7. Since graduating in 2007, Penrice has been working as coordinator of the program.

"During my degree I became excited about agriculture education – something I never expected. It is really rewarding when a young person becomes interested in food production. More and more people are getting farther removed from their food. Working with HIYT is a fantastic opportunity to continue to teach people about agriculture so that we can build an industry that is strongly supported by informed consumers."



Dana Penrice, back row, 2nd left with Grade 7 students at 'Heifer in your Tank 2009'

*For undergraduate program information, please contact the Faculty of Agricultural, Life and Environmental Sciences, Student Services office [questions@ales.ualberta.ca](mailto:questions@ales.ualberta.ca)*



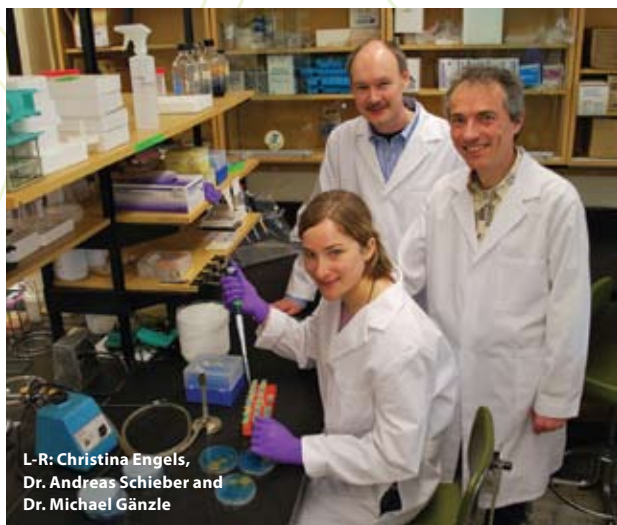
Sabrina Lindquist

**SABRINA LINDQUIST:**  
**ON THE MANAGEMENT TRACK**

As a competitive figure skater, Sabrina Lindquist was well-versed in the importance of good nutrition. "It's really no surprise that I went into Nutrition and Food Sciences."

After completing her degree in 2007, she began working as a dietitian at the Queen Elizabeth II Hospital in her hometown of Grande Prairie. It was a familiar workplace – Lindquist had completed two Dietetic Internship placements at the hospital. At the end of 2008, Lindquist was appointed Manager of Food Services. "This came a lot quicker than I thought because my experience is limited. But this is a very supportive work environment and I'm equipped for the challenge."

Lindquist's responsibilities include food production, food quality and human resources for Food Services at the hospital, which serves approximately 1000 meals per day. "Every day is different in this job – there's never a dull moment."



L-R: Christina Engels,  
Dr. Andreas Schieber and  
Dr. Michael Gänzle

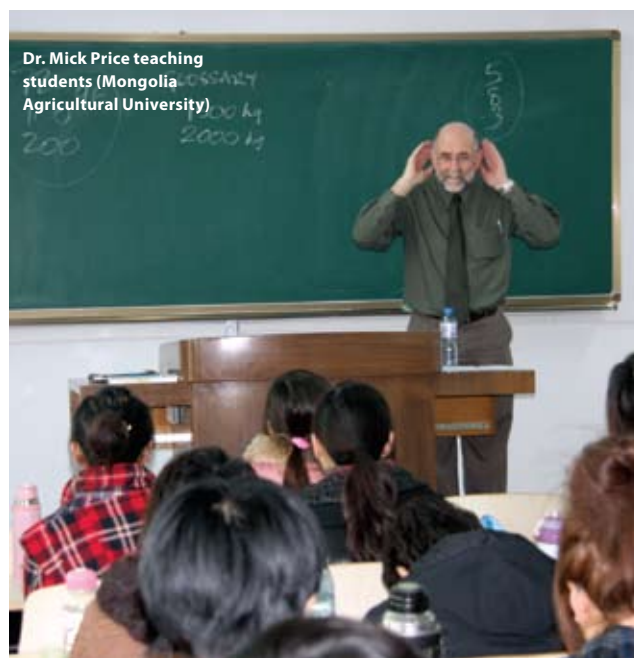
## WORKING THE GERMAN CONNECTION

Two AFNS professors and Canada Research Chairs are using their “German connections” to strengthen international linkages at the U of A. Since 2005 AFNS Associate Professors Dr. Andreas Schieber (Functional Food and Nutraceuticals) and Dr. Michael Gänzle (Food Microbiology and Probiotics) have had undergraduate and graduate students from Hohenheim University in Stuttgart, Technical University of Munich, and the Technical University of Berlin working in their labs for periods of a few months to one year.

“Our previous contacts to these universities allowed us to develop the student exchange from our base in Canada” notes Dr. Schieber. “Personal connections are easy to build on.”

Drs. Schieber and Gänzle note that every year they receive more requests than they can accommodate. In Germany, going abroad for a brief research project is viewed as excellent preparation for graduate studies. The invitation to German students to work at AFNS provides leverage to send U of A students for a similar exchange to Germany.

Dr. Gänzle adds that the student exchange also benefits faculty members. “There are various ways to stay in contact with collaborators internationally; one of the most effective methods – short of going abroad for a sabbatical – is to send undergraduate or graduate students to other labs. This helps to stay connected internationally, to keep current with novel ideas from other labs, and to expand the spectrum of experimental capabilities.”



Dr. Mick Price teaching  
students (Mongolia  
Agricultural University)

## CHINA 2+2 ADDS UP TO SUCCESS

A unique program has grown from the initiative of Dr. Francis Yeh, former Associate Dean (Research) in the Faculty of Agricultural, Life & Environmental Sciences, to develop transfer agreements with Chinese universities. China 2+2 allows students to complete two years of study at their university in China and complete their final two years of study in Alberta. Students who complete the transfer receive a degree from the University of Alberta.

The Chinese universities involved in the agreements are the Inner Mongolia Agricultural University in Hohhot in Nei Mongolia province, Zhejiang Forestry University in Lin’an, Zhejiang province, the Northeast Agricultural University in Harbin in Heilongjiang province, and Nanjing Forestry University in Jiangsu province. The partnerships extend beyond students. AFNS Professor Emeritus Dr. Mick Price and his wife Monica will soon complete a term teaching Meat Science and Conversational English respectively at the Inner Mongolia Agricultural University.

Globalizing its undergraduate, graduate, research and development programs is one of the Faculty’s aspirations and this work is being actively pursued by Associate Dean (International) Dr. Robert Hudson and Renny Khan, newly appointed Director of International Programs.

“Programs like China 2+2 have a number of important benefits,” says Hudson. “They internationalize our student body, and create the opportunities for our students to prepare for life in a globalized world. There is also potential for meaningful and productive collaborative research with prestigious institutional partners in China and elsewhere. Exchanges and research projects are so much easier to arrange when there is a formal partnership.”

### Renny Khan

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### Robert Hudson

Associate Dean (International)  
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Dr. Edward Bork

## RESEARCH ON THE RANGE

No matter what the project, AFNS Professor Dr. Edward Bork's love for rangelands and concern for their sustainability infuses his research. "I'm interested in doing research that helps manage rangelands for future use. I look at ways to maintain and improve productivity, while conserving the long-term health of these ecosystems."

One of Dr. Bork's current projects is a Natural Sciences and Engineering Research Council of Canada (NSERC) and Alberta Sustainable Resource Development (ASRD) supported study on the effects of climate change on rangeland ecosystems. This collaborative effort involves multiple universities and faculties, and stresses linkages among several scientific disciplines. It began in 2006 and will be completed in 2009.

The research involves sites in Alberta (at the Kinsella Research Station), Saskatchewan and Manitoba. Various plots simulate a rise in ambient temperature, drought and wet conditions, as well as different grazing regimes. Measurements on a wide range of variables are used to assess integrated treatment effects on range function. "Given the reality of climate change," says Dr. Bork, "this is critical information for managers of rangelands."

### Edward Bork

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### JANE KING: CHANGING THE FORAGE RECIPE

If AFNS Professor Dr. Jane King's research works out, farmers may one day have a new seed mix for high-quality pasture forage. "While alfalfa is one of the most widely used forage crops in the world, it's not ideal for pastures because it does not respond well to grazing," explains Dr. King. "One of my major research areas is experimenting with legumes other than alfalfa in forage production systems."

Her attention has turned to kura clover, a species native to the Caucasus Mountains. While ideal for grazing, it is difficult to establish when seeded with a fast-growing grass. Dr. King and her team have found a solution using different seeding times for the clover and grass. "The kura clover story is still being told – we don't know yet how it's going to end. But if we can produce seed consistently in Alberta, I think we could have a winner."

### Jane King

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Dr. Jane King



## SWINE RESEARCH TAKES CENTRE STAGE

AFNS is home to one of the nodes of an exciting new Canada-wide network focussing on livestock embryo research – the first of its kind in the world. The NSERC EmbryoGENE Strategic Research Network aims to better understand how assisted reproductive technologies and the nutritional condition of the mother influence embryonic development and, as a consequence, the future wellbeing of the resulting offspring. Data collected will increase our understanding of the factors that influence embryonic health in all mammals, including humans.

The EmbryoGENE Network consists of two research nodes: the University of Alberta will conduct porcine research; Laval University will coordinate bovine research. AFNS Professor Dr. George Foxcroft is a Co-Director of the porcine node of the Network here at the U of A. AFNS Assistant Professor Dr. Michael Dyck will lead one of the research themes within the Network.

“EmbryoGENE builds on the substantial resources of the Swine Reproduction-Development Program and represents a unique opportunity to play a leading role internationally in developing new scientific knowledge in reproductive physiology,” says Dr. Foxcroft. “The project will generate invaluable discoveries with practical applications both at home and abroad.”

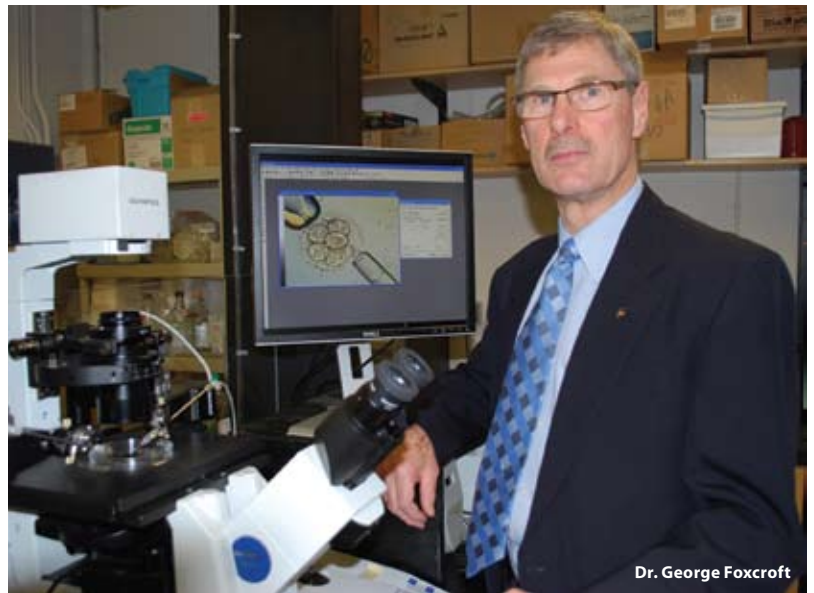
The EmbryoGENE Network brings together researchers from seven Canadian academic institutions, three governmental agencies, and eight industry partners. Research under this new initiative is further enabled by the U of A's Swine Research and Technology Center (SRTC). Development of this \$5-million state-of-the-art facility, supporting world-class research on reproduction and breeding herd management, nutrition and metabolism, and feedstuff discovery, received over \$1 million of support from Alberta Pork on behalf of Alberta's pork producers.

### George Foxcroft

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### Michael Dyck

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Dr. George Foxcroft

## PIGS – MORE THAN PORK

You could say AFNS Associate Professor Dr. Ruurd Zijlstra's research has come full circle. For his PhD, he studied pigs as a model for pediatric nutrition. Now, as Feed Industry Research Chair, his research characterizes new feedstuffs and quality evaluation tools but also combines two interests – swine nutrition and human nutrition.

“The work done by agricultural scientists using the pig model is having a significant impact on our understanding of human nutrition and metabolic diseases apart from the obvious impact on swine nutrition and pork production. There's real synergy between the two areas.”

One particular interest for Dr. Zijlstra is carbohydrate metabolism and how changes in the chemistry of starch and fibre can alter the absorption of nutrients in the intestine. He studies physiological and metabolic responses, including the complex interaction between pig, diet, and intestinal microflora. This research has important implications for pork production and for human diseases such as diabetes.

### Ruurd Zijlstra

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Dr. Ruurd Zijlstra



## DOUBLE YIELD FROM NEW RICE GENES

Research done by an AFNS PhD student has identified a way to double the output of rice crops in some of the world's poorest, most distressed areas. Dr. Jerome Bernier, who defended his PhD in 2008, found a group of genes in rice that enables a yield of up to 100 per cent more in severe drought conditions.

The discovery marks the first time this group of genes in rice has been identified, and could potentially bring relief to farmers in countries like India and Thailand, where rice crops regularly face drought. "For subsistence farmers who rely on the crop to feed their families, this extra yield can make a world of difference," said Dr. Bernier.

Dr. Bernier's research began five years ago and focused on upland rice, which grows in non-flooded, dry fields. He worked at the International Rice Research Institute in the Philippines, in conjunction with scientists there and in India. He started with 126 genetic markers and was eventually able to narrow it to the group of genes that had the desired impact.

Initial tests of rice varieties with Bernier's gene discovery, indicate that upland rice can be made to resist drought much better. In fact, the more severe the drought conditions, the greater the impact the gene will have on the crop's growth.

Rice is the number one crop consumed by humans annually, notes AFNS Professor Dr. Dean Spaner, Dr. Bernier's co-supervisor. "Less loss to drought may also mean an increased supply of rice globally."

Dr. Bernier's work was supported by a large international effort including grants from the Quebec government, NSERC, University of Alberta, Canadian International Development Agency, Consultative Group on International Agricultural Research, and the International Rice Research Institute, the birthplace of the Green Revolution for rice.

### Dean Spaner

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## AFNS HONOURS NON-ACADEMICS 2008

From assisting in laboratories to training students, non-academic staff contribute to the AFNS teaching and research environment. The following non-academic staff members received AFNS Outstanding Achievement Awards at the 10th Annual Celebration of Teaching and Research.



L to R: Holly Horvath, Laurie Heidebrecht, Christine Lee, Shirley Brezden, Clint Lysgaard  
Missing - Kerry Nadeau

### Outstanding Support for Administration

Christine Lee is the Department's Senior Financial Administrator. Christine, who has been with AFNS since 2004, has excellent knowledge of financial information, is fast and efficient, and problem solves questions in a very positive, friendly and professional manner. She has trained several financial staff and covers off for them when needed.

### Outstanding AFNS "booster"

Holly Horvath is the Executive Assistant to the Chair of AFNS, and the Office Coordinator. She has an amazing sense of humour. Holly is referred to as the "office mom" and is very caring. She is very good at giving advice, offering solutions and is incredibly knowledgeable. Members of the Clerical Team who are supervised by Holly say "She makes coming to work fun".

### Outstanding AFNS "booster"

Laurie Heidebrecht is the Administrative Assistant for the Poultry Research Centre (PRC), Agri-Food Discovery Place, and personal assistant to Iwona Pawlina. She is a master in troubleshooting, has a positive attitude and is compassionate. Laurie is the frontline "face" of PRC and always exceeds expectations even when asked to do things beyond her duties.

### AFNS Outstanding Support of Research

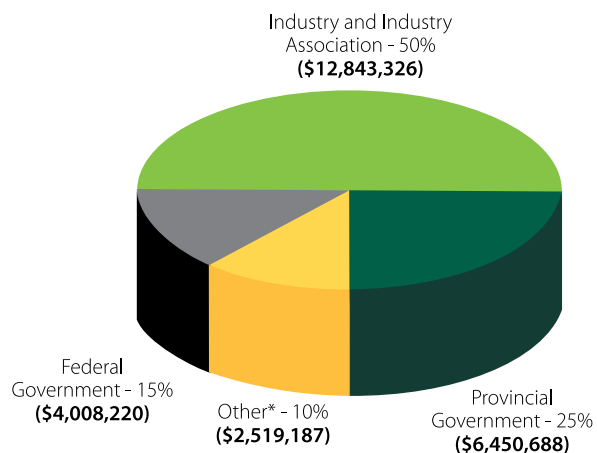
Clint Lysgaard has worked at the Metabolic Unit and the Feedmill at the Edmonton Research Station (ERS) since 1988. Barry Irving, Manager of the ERS, says "Clint is regularly called upon to construct or modify equipment and has helped many of the units at the ERS".

Kerry Nadeau has been a research technician with the Poultry Unit (PRC) since 1999. Kerry is very organized, ultra-efficient, and fun to work with. She is one of the driving forces behind HACCP certification and is the "team glue in making PRC more than just a bunch of chicken people who work together".

### Outstanding Support for Teaching

Shirley Brezden worked as a Technician in Plant Pathology for many years, providing teaching support for courses, particularly PI Sc 380 (Principals of Plant Pathology). She played a critical role in ensuring that the laboratory component of this course is a first rate-learning experience for students. Shirley's knowledge of plant pathology and mycology is impressive, and her easy going manner and helpfulness was greatly appreciated by the students. The students say, "Shirley rocks". Shirley retired in December 2008 after 31 years at the University of Alberta.

### Source of Research Funding



\*Non-Profit, Research Endowment and Other Government

**2008/09 Research Funding**                    **\$25,819,421**

**Operating Budget**                                 **\$8,377,294**

Distribution of Operating Budget

- 63% Academic & Teaching Support
- 9% Administrative & Computing Support
- 11% Central Laboratories
- 17% Research Stations

### Academic Staff

- 68 Professors
- 38 Adjunct Professor
- 36 Postdoctoral Fellows
- 19 Research Associates
- 6 Visiting Scientists

### Undergraduates enrolled in degree programs

BSc Agriculture (includes Pre-Veterinary Medicine)	258
BSc Agricultural/Food Business Management	33
BSc Nutrition & Food Science	568
<b>Total</b>	<b>859</b>

### Graduate Student Enrolment

Masters	116
Doctoral	94
<b>Total</b>	<b>210</b>

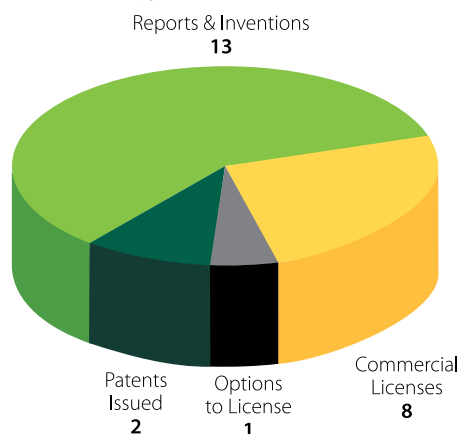
### Central Laboratories include

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

### Research Stations 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. Peter Blenis  
Forest Pathology

Dr. Heather Bruce  
Carcass & Meat Science

Dr. Cathy Chan  
Human Nutrition

Dr. Tom Clandinin  
Human Nutrition

Dr. Walter Dixon  
Molecular Biology

Dr. Lloyd Dosdall  
Agricultural Entomology

Dr. Anna Farmer  
Community Nutrition

Dr. George Foxcroft  
Swine Reproductive Physiology

Dr. Michael Gänzle  
Food Microbiology and Probiotics

Dr. Leluo Guan  
Functional Genomics & Microbiology

Dr. René Jacobs  
Human Nutrition

Dr. Nat Kav  
Biochemistry & Biotechnology

Dr. Jane King  
Physiology of Forage Crops

Dr. Ronald Ball  
Swine and Human Nutrition

Dr. Marleny Aranda Saldana  
Meat Science & Technology

Dr. Mirko Betti  
Meat Processing Technology

Dr. David Bressler  
Fermentation & Bio/Food Engineering

Dr. Edward Bork  
Range Management

Dr. Linda Casey  
Pediatric Nutrition

Dr. Lingyun Chen  
Plant Protein Chemistry and Technology

Dr. Jonathan Curtis  
Analytical Lipid Chemistry

Dr. Michael Dyck  
Reproductive Physiology/Biotechnology

Dr. Gaylene Fasenko  
Poultry Embryology & Hatching Health

Dr. Catherine Field  
Nutrition and Metabolism

Dr. Carolyn Fitzsimmons  
Beef Genomics

Dr. Derek Haley  
Applied Ethology

Dr. Linda Hall  
Environ. Biosafety & Integrated Weed Management

Dr. Robert Hudson  
Wildlife Production/Management

Dr. Johh Kennelly  
Dairy Cattle Nutrition & Metabolism

Dr. Douglas Korver  
Poultry Nutrition

Dr. Diana Mager  
Clinical Nutrition

Dr. Vera Mazurak  
Nutrition & Metabolism

Dr. Linda McCargar  
Clinical Nutrition

Dr. Suresh Narine  
Rheology, Materials Science and Food Physics

Dr. Masahito Oba  
Feed Utilization/Dairy Nutrition

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 Systems Modeling

Dr. Changxi Li  
Bovine Genomics

Dr. Lynn McMullen  
Food Microbiology

Dr. Stephen Moore  
Bovine Genomics

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

Dr. Jocelyn Ozga  
Biochemistry/Physiology/Horticultural Crops

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  
High Value Egg Utilization

Dr. Rong-Cai Yang  
Statistical Genomics and Quantitative Genetics







FACULTY OF  
AGRICULTURAL, LIFE &  
ENVIRONMENTAL SCIENCES  
UNIVERSITY OF ALBERTA

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