



FACULTY OF  
AGRICULTURAL, LIFE &  
ENVIRONMENTAL SCIENCES  
UNIVERSITY OF ALBERTA



# Dare to Make a World of Difference!



# Message from the Dean

## Daring to Make A World of Difference

As the University of Alberta celebrates its first century and looks ahead to its second one with confidence and optimism, a newly-named faculty is well positioned to seize the opportunities of the future and dare to make a world of difference.

The Faculty of Agricultural, Life & Environmental Sciences (ALES) is like no other faculty at the University of Alberta, as much for the wide breadth of our research and academic offerings as for our transdisciplinary programs.

We are a science-based faculty that is uniquely positioned in that our professors and students draw from the natural sciences, the social sciences and the arts and humanities to seek comprehensive solutions to some of the key challenges our province, country and world face today.

For example, global food security has become a major issue. ALES researchers study the

quality and safety of the food we produce and its relation to human health and welfare. Natural resource-based industries, such as oil & gas, contribute substantially to the province's wealth but their impact on the environment is a growing concern. Faculty researchers are studying these impacts and trying to find better ways to manage our water, reclaim and even perhaps restore disturbed areas, and develop more sustainable land management practices.

Other faculty researchers are looking at the economic and social impacts of development on rural communities, contributing to a body of research leading to more informed policies. Still other ALES researchers focus on the dynamic relationships people have with their near environments, including clothing, family home and community. Our undergraduate programs equip students to contribute to efforts in all these areas.

Science and policy are linked at the Faculty of Agricultural, Life & Environmental Sciences. We believe that the causes and solutions for local problems will increasingly be determined by global forces and that proactive strategies must replace reactive responses at all levels from science, public policy and practice.

As you'll notice in the following pages, we are all about our people. We strive to link disciplines, connect discovery and learning, build partnerships and reach out to communities.

Our diverse research program has been built in this way and attracts the second highest amount of external funding per faculty member of the 18 faculties at the University of Alberta. As well, faculty members excel at teaching as four of them have won 3M Teaching Fellowships, the most prestigious teaching award in Canada.

As Dean, I am very proud of the Faculty, its members, staff, students and all that they have accomplished. I look forward to continuing to work with them and all our stakeholders as we strive to continue to dare to make a world of difference.



A handwritten signature in black ink, appearing to read 'John J. Kennelly'. The signature is written in a cursive style and is positioned above a horizontal line that extends across the width of the signature area.

John J. Kennelly  
Dean



## Relevant, leading-edge research

We conduct research that affects the everyday lives of people on issues that are growing in importance all the time. Last year, faculty members attracted \$36 million in external research funding, the second-highest amount per continuing faculty member of the 18 faculties at the University of Alberta.

## Opportunities for collaboration

The Faculty values its strong partnerships with its stakeholders from government, industry, NGOs, academia and other areas. These partnerships are key as they enable the Faculty to build and expand its research excellence while creating opportunities for its partners to achieve their goals.

## Transdisciplinary programs and research

We are where the natural sciences, social sciences and arts and humanities come together. That very unique feature provides us with the ability to offer comprehensive solutions, linking science and policy, to the issues facing society today.

## Student-centered environment

As a smaller faculty, we offer small class sizes, good access to professors who are able to provide the mentoring and support students require to be successful, active student clubs and more scholarships than the majority of faculties at the U of A.

## Teaching excellence

Four of our faculty members have received 3M Teaching Fellowships, the most prestigious teaching honour in Canada. In addition to traditional classroom lectures, we emphasize experiential learning where our students learn to apply the principles they have learned in the real world.

# Quick Facts

- 1,358 undergraduate students
- 416 graduate students
- 108 faculty members
  - 7 Canada Research Chairs
  - 2 NSERC/Industrial Research Chairs
  - 2 University Professors
- Student to professor ratio: 12.6:1
- 4 departments
  - Agricultural, Food and Nutritional Science
  - Human Ecology
  - Renewable Resources
  - Rural Economy
  - and the Devonian Botanic Garden

Offers the following undergraduate degree programs:

- BSc in Agriculture
- Business Management (offered jointly with School of Business)
  - BSc in Agricultural Business Management
  - BSc in Food Business Management
  - BSc in Forest Business Management
- BSc in Environmental and Conservation Sciences
  - BSc de l'environnement et de la conservation (offered jointly with Campus St. Jean)
  - BSc in Environmental and Conservation Sciences/BA Native Studies (offered jointly with faculty of Native Studies)
- BSc in Forestry
- BSc in Human Ecology
  - BSc Human Ecology/BEd
- BSc in Nutrition and Food Science

Proposed programs and schools

- BSc in Animal Health - 2009
- BA in Environmental Studies (offered jointly with Faculty of Arts) - 2009
- School of Forest Science and Management - 2009
- School of Human Ecology

# Daring to Make a World of Difference

## Taking care of veterans' spouses



Norah Keating

**R**esearch conducted by family gerontologist Norah Keating led to a fundamental shift in the federal government's policy towards spouses of veterans. While sitting as an academic expert on the Veterans Affairs' Gerontology Advisory Committee, Keating conducted research examining how the department's programs were benefitting veterans and their families.

She discovered the programs helped the veterans a great deal but the same couldn't be said for their families.

Programs that included assistance with home care, housekeeping, general outside maintenance of their properties, proved to be of great help for veterans with health issues. However, if the veteran had to be placed in a nursing home or passed away, all assistance vanished for the spouse, sometimes leading to her inability to stay in her home. Keating noted the inequity of this situation given that spouses often had provided care to the veteran for many years.

Legislation was enacted and implemented ensuring spouses of veterans receive the same level of service until they no longer require them.



## Valuing environmental goods and services



Peter Boxall

**W**hen damage occurs to a natural ecosystem, such as an oil spill or accidental forest fire, how do you assess the value of the environmental goods and services that will no longer be available while the damage is being repaired?

That's the essential question researchers Vic Adamowicz and Peter Boxall and their team have been investigating.

When damage occurs, such as an oil spill in a lake, there are impacts on commercial activity occurring in the lake but there may also be other impacts including health, recreational services, wildlife, the view of an area and therefore real estate prices and so on. Through observing behaviour and calculating trade offs that individuals make between market goods and environmental quality, the researchers have developed methods that allow officials to value those costs in monetary terms.

Those methods are being used by officials in the United States, Europe and around

the world. A recent example is wastewater that was discharged to a water body in the southern U.S. The wastewater contained mercury which was found in the fish, thus affecting recreational fishing. The methods developed by Adamowicz and Boxall were used to help measure the economic value of the loss in recreational services resulting from the increased levels of mercury in the lake.

By the same token, the methods developed by Adamowicz and Boxall can and are also being used to measure added value resulting from environmental improvements.



Vic Adamowicz



Research conducted in the Faculty of ALES is wide-ranging. While we are a science-based faculty, we examine and advance the world's scientific understanding and apply that new knowledge. At the same time, we are in the unique position where the natural sciences, social sciences and arts and humanities intersect, thus providing us with the ability to offer

comprehensive solutions to today's issues.

Below are four examples of the difference research conducted in our Faculty has had on the world. In the following pages, we present more examples of the difference our work has created according to the four themes under which we conduct our research program.

## Ensuring proper brain development through infant formula

Millions of people around the world can thank nutrition researcher, Tom Clandinin for the good functioning of their brain. In the 1970s, it was generally accepted among scientists that the growth and development of cell membranes, especially in the brain, did not depend on anything the body ingested.

Clandinin proved otherwise.

He was the first to demonstrate that the development of the brain could be altered by the types and amount of dietary fatty acid it ingested.

Eventually, he determined the amount and types of fatty acids required for optimal growth of the human brain and shared that finding with infant formula companies who have brought this innovation to market in more than 65 countries.

Clandinin has further developed the concept of dietary fatty acid balance by showing that change in diet fat alters a wide variety of hormone functions:

- Insulin
- Changes immune functions
- Neurotransmitter synthesis at the level of the synaptosomal membrane



Tom Clandinin



## If Mother Nature ran forest harvesting plans

Does there have to be a trade-off between forest productivity and preserving biological diversity? If so, where is the exact point where forest ecosystem function is preserved and productivity is most optimal?

Those are the questions at the heart of the 100-year groundbreaking study known as EMEND, led by forest entomologist John Spence.

The Ecosystem Management Emulating Natural Disturbance project, which has just completed its first decade, compares natural disturbance with harvesting and tries, as the project title states, to emulate key processes in natural disturbances that go missing with harvesting using indicators such as flora, fauna, soil nutrients and hydrological features.

Initial findings suggest strongly that leaving residual green trees broadly distributed across the landscape, or even retaining small undisturbed forest patches, doesn't allow for the maintenance and speedy recovery of the forest ecosystem. Indeed, findings indicate undisturbed patches need to be at least two to three hectares for the forest biodiversity and associated biodiversity ecosystem functions to be preserved.

The project, which currently involves more than 60 researchers from academia (including students) industry and government, is striving to find the formula by which forest fibre production can fall within guidelines established by Mother Nature.

The research continues.



John Spence

# Sustaining Human Healthy Environments

## Disseminating parent-child attachment strategies

**H**ow do you deliver parent-child attachment strategies within existing community-based family support programs?

Attachment strategies, which have shown that the quality of parenting affects early brain development and children's later development, were primarily used by clinicians working one-on-one with parents and their children. But parent-child relationships researcher Berna Skrypnek and her colleagues wanted to reach many more parents and children. They redesigned the attachment strategies so that they could be used by front-line workers who deliver home visitation and community parent education programs.

The pilot program helps mothers better identify and respond to their babies' cues, promoting babies' development of a secure attachment. Mothers are videotaped with their babies in everyday situations. The videotape is played back to the mothers, providing them, through guided viewing, with the opportunity to see when they responded in sensitive ways and in ways that were not as effective or appropriate.

In the most dramatic case, a young mother of

twins was providing more attention to her larger baby and largely ignoring the smaller twin. After seeing her videotape, she began giving both babies equal attention. Within eight weeks, observers couldn't tell the two babies apart.

Skrypnek and her team are beginning a larger scale study to investigate how attachment strategies can increase the security of infant attachment and improve other social, emotional and cognitive outcomes.



Berna Skrypnek

## Conversations design designs

**P**ower influences everything, even the design of objects and buildings.

Material culture researcher Arlene Oak examined the interactions between an architect and his clients during the process of designing a crematorium with a view to study the effectiveness of user-centered design, which states clients should be more involved in the process, to the point of

making design decisions.

While the architect attempted to solicit ideas from the clients, there was a reluctance on their part to make design decisions. Oak's research reveals there may be a multitude of reasons why this is so, most notably the fact the clients may not feel they have the required expertise to make such decisions.

She further notes that the rhetoric surrounding user-centered design usually doesn't recognize the social relationships that emerge between an architect and a user when they're actually having a conversation, or the clients' pre-existing conditions – their relationships with their own co-workers, supervisors and other colleagues – which have an influence on their behaviour.

Oak's work fits well with the Material Culture Institute, which she and her colleague Beverly Lemire run. The Institute offers a multi-disciplinary perspective on past and present societies, advancing research into human relationships and interactions with the built environment and materials goods of all sorts.



Arlene Oak

This research theme addresses people, specifically focusing on interactions between humans and their personal, inter-personal, physical, community and global environments. It centres on fostering nutritional health and wellbeing and on healthy, safe and rewarding environments in which people create, live, work and interact.

## Stopping the flames

**Y**ou'll be hard pressed to find loose and flowing children's night clothes in the marketplace today, thanks largely to research conducted by Betty Crown.

The retired researcher who worked primarily in textile flammability demonstrated through videotape several years ago the dangers of loose, flowing nightgowns. She also showed that closer fitting garments could be safe as they didn't ignite as easily nor was air available to feed the flames if they did ignite.

The federal government used the findings to change the Canadian Children's Sleepwear Regulations which were later largely adopted, with some differences, by the U.S.

Crown's work in textile flammability led the energy industry to seek her advice.

Their workers were sometimes victim of flash fires, short yet intense bursts of flames, and the industry was looking for the most appropriate protective clothing amid the wide range of offerings on the market.

Crown, collaborating with mechanical engineering researcher Doug Dale, built the first flash fire testing facility in Canada and developed test methods and protocols for the energy industry and forest fire fighters.

Ongoing research in protective clothing will continue as newly-hired researchers Guowen Song and Rachel McQueen work with structural (or urban) fire fighters, examining their unique protective clothing needs with respect to protection, heat stress and comfort.



Betty Crown



## Helping kids get healthy – one step at a time

**P**reventing childhood obesity is everybody's responsibility, says clinical nutritionist Linda McCargar, and schools can play a vital role.

She's conducted numerous studies on the subject, including a recent pilot study at four Edmonton elementary schools that examined how well simple but targeted interventions in schools can influence student health.

The pilot study, One Step/One Bite at a Time focused on two behaviours – activity and fruit and vegetable intake – and gave kids pedometers, noon-hour activities and education about preparing healthy snacks.

Data showed that on average, children were not eating enough fruits and vegetables or

exercising to recommended levels (12-15,000 steps per day) before the study. By the end of the study, these behaviours had improved moderately.

McCargar says the biggest discovery was the enthusiasm of participants. Most children happily took part in noon-hour activities and used their pedometers.

Since the study's completion in 2006, McCargar has continued to research health promotion in schools. She was also involved in writing background documents for provincial nutrition guidelines for schools, child-care facilities and recreation centres in collaboration with Alberta Health and Wellness.



Linda McCargar

# Sustainable Land, Forest and Water Management

## Questioning conventional wisdom

Recent findings that tested conventional wisdom will lead to lower costs for the forest industry, more flexibility in the types of forests that are allowed to be produced and promotion of mixed-wood forests.

Free to Grow (FTG) regeneration standards were adopted by many provincial governments over the last 20 years based on the belief that, in mixed-wood harvested areas, planted conifers need room to grow without competing with deciduous and hardwood trees, mainly aspen.

In Alberta and British Columbia, that meant conifers needed to be free of overtopping hardwood trees within a two-metre radius. To meet this standard, industry sprayed herbicides that killed aspen and many other species, resulting in increased costs and large-scale changes to forest composition.

Forest researchers Vic Lieffers and Ken Stadt tested the concept behind the standards with permanent-sample-plot data from Alberta and found that the trees that were classed as either FTG or not FTG grew at the same rate in the next five years.

As a result of this finding, the use of the Free to Grow standards are being abandoned in the current revisions to the forest regeneration standards in Alberta.



## Restoring the boreal forest

Spreading forest floor materials on top of overburden on a mined area can lead to the boreal forest regenerating itself.

The finding, by ecologist Anne Naeth and her research team, has compelled the provincial government to change regulations recently and require oil sands companies to adopt the practice in their reclamation efforts.

Naeth and her team found the technique to be more effective than planting trees and other plants into the traditional peat mix oil sands companies had been using. She explains the likely reason is that forest floor materials contain many seeds that aren't available otherwise.

Continuing research has Naeth and her team experimenting with various amounts and depths of the materials to optimize its impact in restoring the boreal forest.

Naeth is also working on reclaiming tailings ponds and the dykes that surround them.

To date, researchers haven't been able to reclaim these ponds, which are filled with a slurry, sandy material, a by-product of processing oil sands.

However, Naeth and her colleagues have been experimenting with about 50 different plants. Preliminary findings indicate many will survive and reproduce in tailings ponds.



This research initiative addresses the management of natural capital – critical ecosystems services that provide clean water and air, productive soils, diverse biota and some measure of resistance to biological invasions and diseases.

## Examining our water's future

Natural disturbances attributable in part to climate change in the southern Rockies headwaters are having an effect on the downstream waters, specifically in water quality.

Forest hydrologist Uldis Silins and his team have been studying the changes brought about by the Lost Creek Fire in 2003 that burned 210 square kilometers in the Oldman River Basin in the Rocky Mountains.

They found the fire produced a large amount of sediments, increased phosphorous and nitrogen, and a small increase in heavy metals including mercury.

The level of nitrogen returned to normal levels within three or four years but the level of phosphorous has remained high.

Accordingly, plant life productivity in the headwaters, which typically have few nutrients to support much plant life, has increased significantly as has biodiversity of stream insect populations.

While mercury levels rose, the increase didn't warrant a consumption warning.

Silins and his group are also working with water

treatment engineers, looking at the implications of their findings for downstream communities.

The next phase of research will look at the impact of management techniques to increase the water quantity and develop a framework for source water protection.



## Climate change affecting rural communities

Rural Albertans must brace for the effects of climate change by developing family emergency plans and, on a larger scale, pooling resources with neighbouring communities, warns socio-political researcher Debra Davidson, co-author of a series of reports on the effects of climate change in Alberta.

Davidson's report states that more forest fires, unreliable water sources and difficult farming conditions are some of the effects of climate change that could impact rural areas.

Rural communities are particularly sensitive to the fallout from climate change because they are more likely than large cities to have infrastructure deficits, she says. For instance, there might be one road in and out of a town. In a time of crisis, if that road is blocked off, where would people go?

Remoteness and poor access to resources can also place rural communities at a disadvantage as well as economic reliance on forestry, tourism and agriculture.

While policy changes will have to come from the provincial government to meet larger infrastructure needs, at the local levels Davidson advises municipal districts, towns and county councils to band together to develop regional plans—such as for economic development or regional water management and conservation— that will create resiliency in times of trouble.



# Building the Bio-Economy

## Creating energy from animal fat or oil

Energy doesn't just come from the ground or sun or wind. High-temperature chemistry is enabling researcher David Bressler to create lubricating oil, jet fuel, diesel, gasoline and natural gas out of animal fat or crop seed oil.

Bressler, whose area of expertise is biorefining conversions and fermentation technology, describes the process in steps.

The first step is to heat the chicken or beef fat, or canola oil, with water which creates a mixture of fatty acids and glycerol. Once the mixture is cooled, the fatty acids are separated from the glycerol and water.

Those fatty acids are then heated to a point where the oxygen that is contained within them is released. While this step sounds simple, researchers haven't been able to do this in a cost-effective manner, whereas Bressler has.

Once the oxygen has been removed, the fatty acid becomes a hydrocarbon. Further processing converts that hydrocarbon into the desired fuel.

Bressler recently filed patents for this discovery and is working closely with an industrial partner through a licensing agreement to begin production of different fuels using fat and oil.



David Bressler

## Boosting Canada's seed oil industry

Growing awareness of health risks of trans-fats is changing how consumers shop and pushing commercial baking operations to offer healthier alternatives.

The Bioactive Oils Program, headed by agricultural biotechnology researcher Randy Weselake, is creating healthier versions of canola and flax oils to meet the need of both consumers and food processors.

Weselake and several other researchers that are part of the program are conducting research projects to create lines of canola that yield seed oils higher in saturated fats than conventional oils (as an alternative to trans-fats) and create flax seeds with more polyunsaturated fatty acid content.

The research may help Canadian canola oil compete internationally, particularly with palm oil. Highly saturated palm oil is commonly used in commercial baking because of certain physical properties.

If they succeed in developing a canola that produces a seed oil with some of the attributes of palm oil and is acceptable to North American food producers and manufacturers, it would provide economic benefits for Canadian farmers and create the added benefit of reducing the pressure on rainforests, which are cleared to create palm plantations.

Researchers are also developing flax seeds that contain high levels of certain Omega-3 and Omega-6 fatty acids, linked to neurological health and reduced cardiovascular disease.



Randy Weselake

This research initiative addresses new bio-based economic opportunities that are emerging rapidly in agri-food, forest products, energy, environment, chemicals, plastics and health care. These opportunities are driven by intense economic and environmental pressures to find renewable sources of feedstock to replace those traditionally derived from petroleum.

## Extracting beta-glucan cost-effectively

The health benefits of beta-glucan derived from barley and oats have been known for a long time. Found only in the cell walls of other cereal grains, especially barley and oats, the challenge has always been how to extract beta-glucan in a cost effective manner for use as an ingredient in other food products.

Enter food processing researchers Thava Vasanthan and Feral Temelli.

Together, they developed a fractionation technique that isolates and removes beta-glucan in high enough concentrations from the cereals (without destroying its health benefits) to make it economically viable.

The discovery and other related scientific developments received four patents.

The product result is the highest quality beta-glucan concentrate available and is used as an ingredient in various food products and as a dietary supplement.

Beta-glucan has been shown to help Type 2 diabetes sufferers manage their disease more efficiently, reduce heart disease risk by lowering cholesterol and benefit the immune system. In addition, beta-glucan improves satiety (feeling full) which is why it is also sold as a dietary supplement for help in a weight-loss program.



Feral Temelli and Thava Vasanthan

## Turning fats into products

For many, fats is a four-letter word but research is proving that it has the potential to improve our lives for the better.

Suresh Narine heads up the Alberta Lipid Utilization Program (ALUP), which uses material science, organic chemistry and polymer physics to turn agricultural lipids, fats that come from plants, into all kinds of products, such as trans-fat-free cooking oils to cosmetic ingredients to more efficient fertilizers.

The goal of the research is to create a whole other tier of value, thereby providing farmers with economic benefits, as it adds value to crops like canola and flax. It also benefits the environment since plant-based alternatives to petrochemicals will allow for the creation of consumer goods with less impact on the earth. As petrochemical supplies are limited, the push is on to find sustainable ways to make materials like plastics from different sources.

ALUP's more recent successes include the creation of a \$2-million pilot plant that scales up ALUP's technologies for commercial use, the first set of polymers for a food-based drug delivery system and the development of nano-structures in food oils that, when cooked, release health-boosting compounds or enhance flavour.



Suresh Narine

# Enhancing Global Food Systems



Stephen Moore

## Using genetics to breed a better cow

In the challenge to breed the most productive beef cattle, researcher Stephen Moore leads a team of researchers that has generated more than 125 genetic markers for improvement of beef cattle. Twelve of these have now been validated and commercialized with many of the remainder still in the technology transfer pipeline.

These genetic markers identify groups of genes or chromosomal regions that are responsible for variations of a number of economically important traits such as efficiency, fatness, yield, tenderness and cow longevity. Continued research is underway to identify the specific genes and mutations in those groups of genes that are responsible for the desired traits. A major thrust of the research is to determine how efficiently beef cattle convert their feed into muscle.

This work has also found markers for the trait that enables ranchers to estimate at birth how an animal will perform both with respect to its feed intake and the yield and quality of the meat produced.

Ultimately, the research provides the beef and dairy industries with the ability to develop quality-defined products and change its product output in the highly competitive food industry much more quickly than it ever could in the past.

## Using good bacteria to make our food safe

There is a way to ensure *Listeria monocytogenes* will never again be found in processed meats. Just ask one of the world's foremost food safety scientists, Lynn McMullen. Together with food microbiologist Michael Stiles, they discovered some lactic acid bacteria that will kill or inhibit *L. monocytogenes*.

The lactic acid bacteria produce antimicrobial peptides, or little proteins, that inhibit or kill other bacteria.

*L. monocytogenes* is a bacterium that causes listeriosis, a rare and sometimes fatal food-borne infection that is hardy and able to grow in temperatures ranging from 4C to 37C. It has been found in hot dogs, deli meats, raw meats, some cheeses and other products as well.

McMullen, Stiles and their industry partner are looking at the most efficient and cost-effective ways to apply the bacteria and their peptides into different foods.

It's easy to apply the bacteria to processed foods such as hot dogs by spraying the organism into the package. It is there that the lactic acid bacteria produce the necessary antimicrobial peptides that kill the *L. monocytogenes*.

Other products such as sliced deli meats are more challenging and work continues to determine how best to deliver the antimicrobials in a way that doesn't impact the appearance or quality of the food products.



Lynn McMullen

This research initiative addresses the critical need to enhance the food system and encourage further development of efficient agricultural and food industries that promote and support optimal human and animal health. The aim is to link efficient production systems to value-added industries.

## Saving canola from the threat of new diseases

In the 1980s, a disease called blackleg threatened to take down the canola industry. Fortunately, the Faculty's Gary Stringham successfully bred a line of blackleg-resistant canola called Quantum canola. The resistance gene he discovered is now found in most varieties of canola.

Unfortunately, plant diseases are always evolving. Even after resistant varieties are created, diseases adapt and spread, making disease prevention a continuing struggle.

Plant pathologist Stephen Strelkov and canola breeder Habibur Rahman are working on the latest emerging disease in canola, clubroot, which causes root deformities that impair absorption of water and nutrients.

Strelkov has been surveying infected fields, characterizing and isolating the strains of the disease. Meanwhile Rahman is using these strains in his breeding research to test new lines of canola designed to be resistant to the clubroot pathogen.

Clubroot has become more prevalent in the last few years and has contaminated about 400 fields in central Alberta.

Because clubroot's spores can lie dormant in soil for long periods of time, the disease is a significant threat to the industry and could potentially cause significant yield losses.



## How to market to organic consumers? It depends

While research reveals Canadian consumers are increasingly purchasing organic products, marketers are having a difficult time pinpointing the organic consumers' motives. Indeed, studies clearly demonstrate there is no typical organic consumer.

Resource and environmental economist Peter Boxall and his team looked at what motivated buyers of organic wheat bread. They found that if consumers weren't able to taste the product, the most effective way to market the product was to focus on the environmental benefits. Health claims were only viewed positively when the bread could be tasted.

In another study, agricultural marketing researcher Ellen Goddard and her team examined consumer behaviour towards organic eggs. They found a strong association between a willingness to pay a premium for organic eggs and consumers who displayed health conscious behaviours and those who expressed a desire to eat "naturally." Surprisingly, those who expressed high levels of concern for the environment were not willing to pay more for organic eggs.

Value-added marketing researcher Sven Anders wondered if consumers of organic meat consistently purchased organic meat products. They didn't. In fact, consumers of meat were found to be very price sensitive and generally would only try organic products if they were competitive in price with non-organic products.



# Teaching and Learning

While much of the public attention that universities garner centres around research discoveries, the Faculty of Agricultural, Life & Environmental Sciences is equally committed to providing an outstanding undergraduate experience that blends traditional classroom and experiential learning.

ALES is committed to an academically rigorous undergraduate curriculum with a focus on experiential education that prepares students to be successful in an increasingly complex and rapidly changing world. Our Faculty is considered a leader in this area at the University of Alberta.

Well known as a student-friendly faculty in which students can easily get to know one another and their professors, our undergraduate programs are transdisciplinary in nature. They include strong foundations in both natural and social sciences with a focus on the development of research and inquiry, critical thinking and communication skills, as well as the application of knowledge to solve complex real-world issues.

Ten cornerstone courses are offered and more are planned. These courses, taught by our most engaging

instructors, serve two purposes: to expose students in certain programs to a broad disciplinary perspective and to capture their imagination and enthusiasm for the breadth of their discipline; and to provide opportunities for students from outside the faculty of ALES to sample from our breadth of disciplinary expertise. Two notable examples are ANSC200 where half of the students are from outside ALES and NUTR100 where 75 per cent of the students are from outside ALES.

More than a third of our courses include a laboratory component and many include short field excursions during laboratory periods or on weekends. Our programs provide ALES students with experiential learning opportunities through field schools, practicums, internships and exchanges. All Forestry and ENCS students attend a three-week field school held in the month of May following their second year. Every Human Ecology student undertakes a practicum and students in the Nutrition major can apply for the Integrated Dietetic Internship. In addition, we offer a Faculty Internship Program, which allows students to integrate work





experience into their education program.

Each student is required to participate in a capstone course which is a project-based inquiry course in which students apply what they have learned to solve a real-world problem, sometimes with an external partner organization.

All departments within ALES have strong and effective graduate programs that produce outstanding graduates who have gone on to become influential academics, researchers and professionals (see next pages for short profiles of students and alumni).

We are committed to the junior colleague model of graduate education and consider graduate students to be fellow scholars and researchers. A particularly strong point of our graduate programs is the opportunity for students to engage in world-class scholarship while pursuing projects that have immediate practical applications. Our graduate programs have a strong international flavour because their applied nature is very appealing to students from outside Canada. Our current ratio of undergraduate to graduate students is 3.26:1.

Four of our faculty members have earned 3M Teaching Fellowships, the most prestigious teaching honour in Canada. The fellowships are awarded to individuals who excel in the teaching of their own courses and who also demonstrate an exceptionally high degree of leadership and commitment to the improvement of university teaching across the country.

Poultry researcher Frank Robinson, livestock researcher Mick Price, plant ecologist Anne Naeth and swine expert Frank Aherne each won the prestigious award.



Frank Robinson



Anne Naeth



Mick Price



Frank Aherne

# Students and Alumni

**Leanne Haney** is a 4th year Nutrition and Food Science student. She's pursuing a BSc with a major in nutrition and a minor in physical activity.

Upon graduation, she plans on becoming a registered dietitian and work in schools and communities to help people improve their health and nutrition.

Leanne has received eight scholarships during her undergraduate studies, including the Faculty's Academic Excellence Scholarship, the Mary Davidson Howard Bar None Award and the Hussar Family Bar None Undergraduate Leadership Award.

The active and outgoing student is heavily involved in student groups and activities. She is Co-President of the Nutrition and Food Science Students Association, a member of the faculty executive, the Inter-varsity Christian Fellowship group and the Golden Key International Honors Society and volunteers with the Health Nuts Student Kitchen and the Campus Food Bank.

As if that wasn't enough, she's also in training for her first triathlon and is a health and wellness facilitator at a local junior high school.



**John Pattison** is in his second year of a two-year MSc in Agricultural and Resource Economics in the Department of Rural Economy. He is focusing on wetland benefits and valuation of wetland restoration and retention in Manitoba.

While his long-term professional aspirations are to be employed in the environmental field, specifically working to enhance the relationship between agriculture and the environment, upon graduation he would like to continue the work he began in 2006-07 when he was an Environment Officer for the CIDA Youth Internship Program in Uganda.

This desire comes from his sense that contribution and service in the developing world is a responsibility that those of us with "more" should participate in.

John has been actively involved in student activities, having been a member of numerous student clubs, councils and committees, actively promoting students' interests.

An accomplished violin player who performs publicly, John has also earned more than a dozen scholarships and awards including the Onesimus Service Award, the Gold Key Recognition Award and the BJ McBain Scholarship.



**Tannie Mah** is in the final year of the MSc program in protective clothing research in the Department of Human Ecology.

When she graduates, she will build a career in the textile industry within industrial or government settings, focusing on protective clothing.

Tannie has focused almost exclusively on her studies and it shows in the 16 scholarships and awards she has received during her undergraduate and graduate years.

Two scholarships of which she's particularly proud are the 2005 Natural Sciences and Engineering Research Council of Canada's Graduate Scholarship – Master's, and the 2008 Graduate Student Teaching Award.

In fact, in her years as a graduate student, she had the opportunity to be a teaching assistant for five undergraduate courses and also to teach a spring session course, all of which were invaluable experiences that she says enhanced the quality of her graduate program.



Nurturing a culture of excellence in research and teaching creates an exciting environment where students are inspired and challenged to develop their potential and dare to make a world of difference. Here are just a few examples of some of the extraordinary students that call the Faculty of Agricultural, Life & Environmental Sciences home.

**Kirk Hawthorn** is completing the final year of his BSc degree in forestry in the Department of Renewable Resources.

Next spring, he'll begin work as a registered professional forester in training in Grande Cache. Once he's completed two years, he'll be able to challenge for the registered professional forestry exams.

By all accounts, that shouldn't be a problem. A gifted student, Kirk has received more than 15 scholarships throughout his undergraduate studies, most notably the Michael Swan Memorial Scholarship and the Herber and Jeannette Hall Award in Forestry, both recognizing high academic achievements.

Beyond getting his professional forester's designation, Kirk is considering pursuing graduate studies and would ultimately like to begin a forestry consulting business specializing in hydrology and watershed management.

Kirk has been a member of the Forest Students Society and currently serves as its treasurer.

An avid outdoorsman who enjoys hunting, hiking and fishing, he is also an accomplished whitewater kayaker who has competed on the international stage placing in the top 20 in the world.



With its rich history, the Faculty of Agricultural, Life & Environmental Sciences has many outstanding alumni who have contributed in very significant ways. Here is a representative sample of some of our alumni, each of whom has been recognized in some way by the University of Alberta for their contributions.

**Fred Bentley**, '39 BSc(Ag), '42 MSc, '90 DSc (Honorary), dedicated 50 years of service to international agriculture development work. A former Dean of the Faculty, he conducted pioneering soil research at the University's Breton Plots that have contributed to substantial increases in food production not only in Alberta but in many countries worldwide.

**Roy Berg**, '50 BSc(Ag), former Dean of the Faculty, is an internationally recognized scientist, revolutionized Alberta's beef cattle industry through his innovative research into crossbreeding conducted primarily at the University's Kinsella Ranch. His hybrid beef breeding programs led to a 30 percent increase in production, helping make Alberta a world leader in beef production.

**Betty Jones**, '55 BSc (HEC) is the founding chair of the Foundation for the Children of the Californias. With her visionary leadership, this tri-national foundation (a Mexican, Canadian, and U.S. collaboration) constructed Hospital Infantil de las Californias in Tijuana, that region's first

full-service pediatric specialty centre for children regardless of ability to pay.

**Alex F. McCalla**, '61 BSc(Ag), '63 MA is highly regarded for his research in international trade. A former faculty member at the University of California at Davis, he served on the Consultative Group on International Agricultural Research (CGIAR) for more than 20 years. Upon his retirement in 1994, he became the director of the Agriculture and Natural Resources Department of the World Bank.

**Bob Church**, '62 BSc (Ag) is a world-class molecular and developmental geneticist. An Alberta rancher and a professor emeritus, he is internationally respected for advancing excellence in scientific research and promoting the benefits of science to economic growth. His research in embryo manipulation and transplants in livestock resulted in significant scientific and economic advances.

**Jay Hair**, '75 PhD, was president and CEO of the National Wildlife Federation, the world's largest environmental education organization.

He served as president of the International Union for Conservation of Nature, a global network of scientists and conservation professionals. He also co-chaired a sector of former U.S. President Bill Clinton's Council on Sustainable Development.

**Joelle Fawcett-Arsenault**, '04 BSc (HumanEc), is executive director of the Society for Assisted Cooperative Recovery from Eating Disorders (SACRED), for which she was a founding member in 1996 when she was only 17. The Society has made Edmonton a leader in the treatment of people with eating disorders. She also co-founded a consulting business with her husband, working with the non-profit sector.

**Alicia Entem**, '08 BSc, is the first person from our Faculty to win both the Governor General's Silver Medal and a C.D. Howe Fellowship, two very prestigious awards that recognize superior academic achievement, at the same time. Alicia is currently working as a research assistant. She will soon leave to travel overseas before entering a masters program next year.

# Looking Forward

The Faculty of Agricultural, Life & Environmental Sciences aims to build upon its strong foundation to enhance student experiences and further strengthen linkages between research and public policy. It will continue its ongoing commitment to research excellence while focusing its efforts on many of the most pressing issues facing our society.

The Faculty enjoys the benefits of a strong infrastructure to help it conduct its research program. Its main campus facilities include well-equipped laboratories, smart classrooms, up-to-date computing facilities, museum-quality storage facilities for its clothing and textile collections, greenhouse and growth chamber facilities and a number of specific research facilities.

On South Campus and beyond, the Faculty has a number of research facilities that support research in animal production, crops, range management, food and bio-resource processing, water and forest management, conservation and sustainable land use, and protective clothing. The Devonian Botanic Garden and adjacent Woodbend Forest, off-campus facilities unique within the University for their development and maintenance of living plant and fungal collections available for research in conservation, ecology, horticulture and systematics, serve key roles in education, research and community engagement.

To ensure the Faculty capitalizes on its growth

potential, a new state-of-the-art building located on South Campus with research and teaching facilities is in the planning stages. The University has identified this building as a high priority.

Current infrastructure expansion includes developing newly donated land of 777 acres as the St. Albert Research Station. It will replace the smaller Ellerslie Research Station while the Kinsella Research Station has been expanded to support research growth, especially in the area of Bovine Genomic Research.

The Faculty plans to increase its undergraduate student population in a measured manner while maintaining its primary focus on providing a high quality educational experience. Its objective is to achieve a total undergraduate enrolment of 1,800 students by the year 2013 with a focus on recruiting top-quality students.

The Faculty is equally committed to better serving communities near and far – inner-city, rural, remote, and international. It aims to better prepare its students for lives in a rapid-paced and ever-changing world through globalization of its curricula, increased international student enrollments, and more opportunities for work and study abroad. Through strategic partnerships with like-minded organizations, the Faculty will build institutional capacity to grapple with the urgent need to help manage global challenges.





## Fund development

Philanthropic dollars are an important source of funding for the Faculty of ALES. Thanks to the generosity of our donors, we have developed an endowment of more than \$20 million over the years. In addition, we have realized considerable success recently as donations to our Faculty have increased 52 per cent between 2005 and 2007.

The Faculty is committed to raising philanthropic dollars to support the implementation of our Academic Plan. The focus will be on building the Faculty endowment to increase long-term capacity and fiscal stability. We aim to leverage philanthropic gifts, partly through the provincial Access to the Future Fund, to maximize their impact. Our priorities for the current fund development campaign include:

- International awards and exchanges
- Experiential learning
- Integration of teaching and research
- Endowed chairs
- Undergraduate and graduate awards
- Infrastructure to support research and teaching

We are actively pursuing funds for a new building at the Devonian Botanic Garden building, completion of the Agri-Food Discovery Place and outfitting of space in the Health Research Innovation facility.

## Dean's Team

**Dr. John J. Kennelly**  
Dean

**Dr. Vic Adamowicz**  
Associate Dean (Research)

**Dr. Peter Blenis**  
Associate Dean (Academic)

**Dr. Peter Boxall**  
Acting Chair, Department of  
Rural Economy

**Dr. Bruce Dancik**  
Director  
Devonian Botanic Garden

**Dr. Bob Hudson**  
Associate Dean (International)

**Dr. Erasmus Okine**  
Chair, Department of  
Agricultural, Food & Nutritional  
Science

**Dr. John Spence**  
Chair, Department of Renewable  
Resources

**Dr. Deanna Williamson**  
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