

AGRICOLA



FOR ALUMNI AND FRIENDS OF DALHOUSIE'S FACULTY OF AGRICULTURE

SPRING 2022



**Sustainable
animal
agriculture**

In memory

The Faculty of Agriculture and the Alumni Association acknowledge the passing of the following alumni. We extend our deepest sympathy to family, friends and classmates.

Jack Gammon	1946
Arlington Mair	1948
David Clark	1950
Karl Winter	1951
John Eaton	1957
Brian Ellsworth	1957
Robert Bennett	1959
Campbell Gunn	1959
Archie Cook	1960
Kerry Wilson	1961
Andrew MacLennan	1962
Robert Nutbrown	1967
Alexander Chisholm	1972
Vernon Mingo	1976
Stewart Morrison	1987
Isabelle Seager	2003
Daniel Keith	2017 & 2019

Make a memorial gift

Honour a classmate or a friend with a memorial gift to the AC. Your thoughtful gift will be used to support student scholarships or bursaries, to improve campus, or to support an area that is of importance to you or your honouree. An acknowledgement of your gift will be sent to the family of the deceased. For additional information on memorial gifts, please contact Donor Relations at 902.893.6721. Make a gift online at dal.ca/giving.

COVER PHOTO: The pigs at Snowy River Farms graze in a large wooded area and are raised on a diet of fresh grass, non-GMO grains, as well as vegetables and fruits, which are discarded from local stores and restaurants.



Cox Institute tour
Dick & Marj Huggard (Class of '56) enjoyed a tour of the newly renovated Cox Institute. Pictured above taking a rest in a lecture theatre.



AGRICOLA

VOLUME 52, NO. 1, 2022



**DALHOUSIE
UNIVERSITY**

FACULTY OF AGRICULTURE

Cover photo:

Nick Pearce, Dalhousie University

Published twice yearly by Dalhousie's
Faculty of Agriculture

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Mail Sales Agreement No. 40063668



SPRING 2022



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Alisha Johnson

Editor, AGRICOLA

Manager, Alumni Engagement and Donor Relations, Faculty of Agriculture

Message from the editor

The days are longer and brighter, temperatures are rising, sap has been flowing and birds are chirping. All are welcome signs of spring after the long winter (of many storms, if you are in Nova Scotia!). We are two full years into the global pandemic, and every single one of us have had to adjust our routines, in more ways than one, and continue to pivot with little notice.

No one knows the struggles of the pandemic more than those involved in agriculture – labour shortages, increased health and safety regulations, market fluctuations, supply chain delays, shutdowns, closures and more. But right up there with health care workers, no one has been more appreciated through the pandemic, than those producing our food.

The pandemic has certainly heightened awareness of food security, both locally and globally. Through our strategic goals, the Faculty of Agriculture has been committed to achieving global food security, while reducing negative environmental impacts, for some time. The biggest question is — how can we feed the growing world population but also, how can we do so, sustainably?

This issue of AGRICOLA focuses on sustainability in agriculture and specifically, animal agriculture. What role does animal agriculture have in feeding this growing population?

We were pleased to be able to bring together Dalhousie's President, Deep Saini, Dean David Gray and Executive Director of the Nova Scotia Federation of Agriculture, Carolyn Van Den Heuvel (our very own alumnae!) to address the topic of sustainable agriculture during a panel discussion. You can read their conversation, beginning on page 4.

We also had interesting conversations with alum, Dr. Rob Kinley (page 10) who is working to transform the cattle industry into a more carbon-friendly industry, as well as our own campus researchers, Drs. Colombo, Rathgeber and Manafiazar (page 12) who believe animal agriculture is part of the solution, but changes are necessary.

Back in late fall, we were thrilled to visit a few alumni operations to interview and photograph for Around & About stories (beginning on page 20). As always, it's inspiring to hear stories from our alumni and tour their operations — truly my favourite part of my job. We are so appreciative of being welcomed into your homes to learn and see what you do!

We were lucky to resume a few in-person events this past year, including the Blue & Gold Awards where we honoured Niki Jabbour, TJ Harvey and Geneve Newcome (page 34). Plans are already underway for the 2022 Blue & Gold Awards, which are part of Homecoming, in October. If you know of an alum who should be nominated for one of our three alumni awards, please let us know!

I hope you enjoy this issue!

Alisha Johnson | Alisha.johnson@dal.ca | 902.893.6022



We have a limited supply of *The Autistic Brain* and *Animals Make Us Human*, authored by honorary degree recipient, Temple Grandin. We would love to offer these to alumni who would be interested in receiving a copy. Please reach out and let me know. First come, first served.



Dr. David Gray

Dean, Faculty of Agriculture
Principal, Dalhousie Agricultural Campus

Message from the dean

Sustainability means meeting our own needs without compromising the ability of future generations to meet their own needs. In addition to natural resources, we also need social and economic resources.

This issue of *AGRICOLA* is focused on the sustainability of our environment and our economy as we attempt to feed a world population that is expected to grow by over a third, or 2.3 billion people by 2050. This cannot be attained without some reliance on animal agriculture.

Feeding a world population of 9.1 billion people will also require raising overall food production by close to 70 per cent. There will also be a need to focus on reducing food waste and insecurity, increasing efficiency of production using innovative technologies and leveraging cutting-edge research.

Innovative technologies and cutting-edge research are taking place on our campus right now as we attempt to lead the industry into the 21st century.

Dr. Ghader Manafiazar is investigating feed efficiency, greenhouse gas emissions and fitness traits in livestock using innovative techniques such as nutrition, genetics, and machine learning. Dr. Stefanie Colombo investigates sustainable feed in aquaculture, countless farmers, scientists, and researchers are working to evolve the way that Canadian crops are grown and maintained. Alumnus Dr. Rob Kinley is feeding algae to cows, with reduced methane emissions as a result. And the list goes on. You can read more on these innovators in this issue.

Sustainability also has a societal impact on the Faculty of Agriculture and the Dalhousie Agricultural Campus as we work to sustain the growth of our Faculty and our campus and recruit bright minds and innovative scientists to our community. It has been nearly 10 years since we merged with Dalhousie University and the agricultural sector has moved on significantly over that time meaning the term 'agriculture' is now often misunderstood by the public. Agriculture is perceived to relate specifically to 'farming' but when people picture farming, they describe farming from the 1960s and 70s with most having no idea what modern agriculture looks like or what is involved or required to succeed.

The word *agriculture* also does not reflect the breadth and depth of our programming and activities.

We recently struck a Faculty Council committee with broad representation to review our name to determine if it best represents who we are and what we do moving forward.

We have also begun to work with other like-minded faculties throughout the university to expand our academic program offerings here in Truro. Thirty students from the Faculty of Science will be on campus in the fall with an option to complete two years on the Agricultural Campus before moving to Halifax for their final two years. A general agriculture major, double majors and further expansion is also being considered.

As we celebrate 10 years of merger with Dalhousie University throughout 2022, we will also be looking forward to our next 10 years and the sustainability of our Faculty, our campus and our community.

Dean David Gray | @limpetman



"...In the old days, you would have covered a field with weed killer. Now, they've developed technology that allows us to drive through a field of wild blueberries and the computer identifies whether it's a blueberry bush or a weed...We are also working on the efficiency of the harvesters, and with drone technology."

– David Gray



Agriculture: The great innovator

In mid-January, Dalhousie University President Deep Saini, Dean of Agriculture David Gray, and Nova Scotia Federation of Agriculture Executive Director Carolyn Van Den Heuvel met in a boardroom at the Faculty of Agriculture to discuss feeding the world, environmental stewardship, and food security. The panel was moderated by journalist Philip Moscovitch.

This is an edited version of the discussion.

Philip Moscovitch (PM): Why don't we start with the biggest challenges we're facing globally over the next 30 years, and then we'll move from that into talking more specifically about food.

Deep Saini (DS): The pandemic is a transitory challenge. It's going to pass. So let's look at the more sustained challenges. Climate change is going to be the issue of the next 30 years, and the whole issue boils down to moving away from fossil fuels.

Then there is population. I grew up in a country that at one point was standing on the brink of starvation. And then in the 1980s or so, we became more and more focused on people as consumers, rather than people as mouths to feed. But the reality is those mouths still have to be fed. Eating habits have moved progressively up the food chain, and that means greater burdens on the land, and greater inputs of energy, and that has an impact on climate change.

The third major challenge is social cohesion and polarization. Disparities are increasing and the division between haves and have-nots is increasing. Those disparities are going to be a huge issue.

David Gray (DG): I completely agree. We are at this moment where we have to take action now in order to reduce the warming of the planet. We've got 30 years to figure out how to feed a global population of 10 billion. And the third issue from my perspective is water. Fresh water is finite and a key resource. Agriculture is the largest user of land on the planet by far, but we are also the largest user of water. So we will be looking at using technology to make our farming more efficient and effective.

Carolyn Van Den Heuvel (CVDH): Reflecting on this pandemic, we're recognizing that when we make decisions, they affect the entire world – not just Canada, and not just Nova Scotia. I know it's a bit of a cliché, but it all comes down to sustainability, and to me sustainability is people, planet, and profit. Those are the elements we need to keep on our radar for the next few years. What I do on my little farm here in Nova Scotia, you know, there's a ripple effect.

DG: Whatever we do, we have to take into account the effect it's having on the planet. We've been doing things that aren't sustainable for too long.

DS: Let's put some numbers on this. Agriculture uses directly about 20% of the world's energy, and about 30 per cent if you include processing. That's huge. It also produces 25-30 per cent of greenhouse gases. And 67-70 per cent of fresh water is used in agriculture. People say I'll take shorter showers and that will solve the problem. No, that's not going to solve it!

CVDH: We are significant users of water but also the reality is that we are producing food. It's such an essential industry, at the base of our entire being. And sometimes the answers are more complex than we think they are. It's not just chopping something to reduce a number.

DG: Completely agree.

PM: Can we talk about food security, as both a local and a global issue?

CVDH: Over the last year, people have become more aware of food security challenges. We need to be strategic about identifying some of the research and technology to ensure that we can keep food affordable and available in Nova Scotia, while recognizing that farmers are also running family businesses. We need our farmers to be profitable enough to be able to survive. For the last five decades we've been evolving our practices, but we need to evolve them at a faster pace.

DG: People don't realize agriculture is one of the very earliest adopters of technologies.

CVDH: Right.







DG: If you look at the industrial revolution and steam power, agriculture was there first. We have to be innovative in agriculture: being competitive, reducing costs to make food affordable. Good quality, safe food at an affordable price. That's the triangle, and trying to hit those three together is really hard.

DS: Our own consumption has become much more diverse, which is a good thing. But if you can't get fresh tomatoes, that's not a survival issue. What is a survival issue is the purchasing power of the consumer. Again, that brings us back to disparities. You have a serious problem if you have sections of your communities that can't afford food — on a global scale the case can be made there's enough food to feed the population. It's the distribution and affordability.

PM: You've said the general public don't think of farming as technologically sophisticated. Can you say more about that?

DG: The perception of agriculture is so out of date and so backwards that very few people really realize the requirements to put food on people's plates. They don't understand the knowledge, the skill, the technology. You are a jack of all trades.

CVDH: We've been evolving with technology forever, but it's not just about technology. It's about empowerment and knowledge. One of the best parts of my job is seeing diverse operations, different types of business structures, and I wish I could show the public that side of it, and it would shift that conversation. It's amazing to see the resiliency in the farm community.

DS: What you are talking about is the reality of family farms.

DG: And it's not just the farms, it's the job security and employment farms bring to rural Nova Scotia communities as well. In Atlantic Canada, agriculture as a model is very different to Alberta, Saskatchewan and Ontario.

CVDH: There's a lot of diversity on our farms.

PM: Can agricultural technology affect climate change?

DS: Let's look at nitrogen fertilizer. On a global scale, much of the nitrogen applied goes as runoff into rivers and lakes. Can we apply that fertilizer in a more controlled manner? We are getting better at it all the time. Same thing goes for water. I get very concerned when I see that people in major agricultural countries are still engaged in flood irrigation. Drip irrigation and sprinkle irrigation are much more efficient. These are examples of things that make agriculture more climate-friendly, but also more economically sustainable.



DG: Building on what Deep just said, we have a precision agriculture team here, and they've been working with the blueberry industry for decades. In the old days, you would have covered a field with weed killer. Now, they've developed technology that allows us to drive through a field of wild blueberries and the computer identifies whether it's a blueberry bush or a weed. You have this variable-rate sprayer with multiple nozzles that drives across the field, so there's a reduction in chemicals, reduction of costs, you're not putting the same number of aerosols into the environment, and you're improving efficiency. We are also working on the efficiency of the harvesters, and with drone technology. And we are moving into the phase of autonomous vehicles. With the fleet of tractors we have on campus, you can have one operator driving several tractors. It's absolutely incredible.

CVDH: I think this is one piece of the puzzle, and it's an important piece of the puzzle. But there are other innovations: intercropping systems, plant breeding, animal breeding in terms of genetics. Technology also plays a role in addressing our labour challenges. We are not necessarily going to change the number of workers we need, but the skill level we're going to need in our workforce will be very different.

PM: What about the role of animal agriculture?

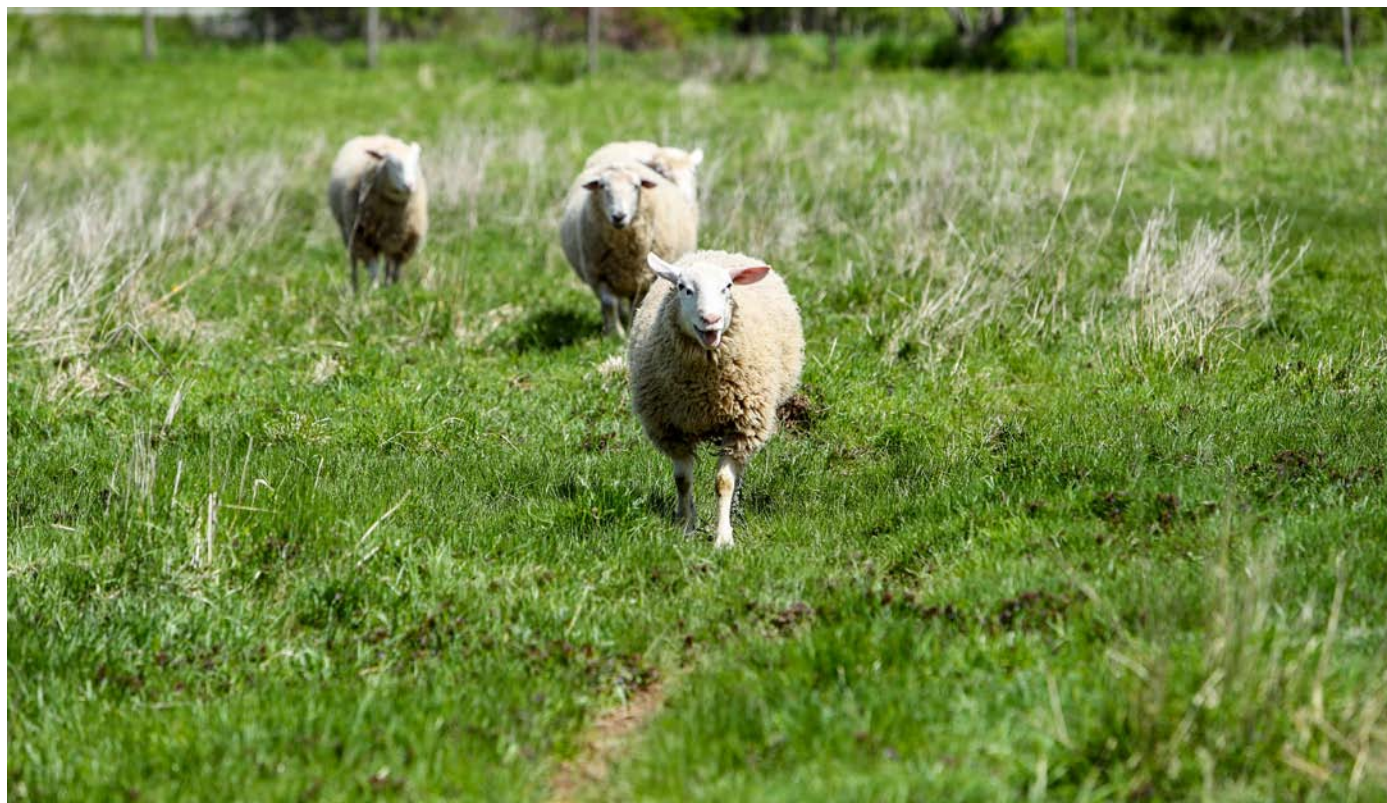
DG: There are people who think animal ag is the culprit, and needs to go. My view is animal agriculture is not going to go away if we are going to meet the nutritional and dietary requirements of 10 billion people over the next 30 years, it's certainly not going to be all plant-based. Yes, we need to increase plant production and plant protein, but we need to look at alternative sources. Aquaculture is a great opportunity for us.

DS: Another thing I would say is don't forget the culture. We can produce meat artificially in the lab and it probably will be produced at scale at some point, but human beings don't eat only with their mouth. They eat with their eyes and with their nose. People will always continue to use their senses for eating.

PM: It's been a great conversation. Any final thoughts?

DG: I would add that in the same way that agriculture has always been an early adopter of technology, it has also been a driver of technological development. Agriculture has always been keen and open to working with researchers, because they understand the importance of the research and putting it into practice. There's a constant symbiosis between academia, research and the industry.

CVDH: We are sitting here in this boardroom. We are so lucky to have this Faculty of Agriculture in our small Atlantic region, to be able to work so closely between research and industry. It's a real asset.



Transforming cattle farming into a more carbon-friendly industry

Dr. Robert Kinley

Imagine a product that can lower methane emissions, help clean polluted waters, and revitalize economies in Indigenous communities.

Would you be surprised to learn it already exists — and it's a seaweed?

By adding seaweed to feed, “we can reduce feedlot cattle to almost no emissions of methane at all,” says Dr. Robert Kinley (Class of '05 & '06), chief scientist at Australian company FutureFeed.

The story starts in the early 2000s, when PEI dairy farmer Joe Dorgan noticed his cattle produced more milk and were in better health when they grazed on seaweed. Dorgan approached Kinley at the Dalhousie Faculty of Agriculture, and asked him to look into the properties of seaweed and their effects on cattle. While doing the research, Kinley stumbled on a discovery he says “was one of the pivot points of my career.” He noticed that cattle who ate seaweed emitted 15 to 20 per cent less methane. That led him to study specific seaweeds to see what results they would produce. He continued his work in the Netherlands, and then at the Australian Commonwealth Scientific and Industrial Research Organisation (CSIRO), before moving on to FutureFeed.



Kinley began testing a cross-section of seaweeds and micro-algae, and saw promising results. But one of them was particularly impressive in terms of its effects on cattle emissions. It's called *Asparagopsis*, and Kinley found that when it was included in cattle feed, it dramatically reduced the amount of methane the animals produced. He says the result "shocked me. I didn't even believe it, because I couldn't detect methane at all. It was completely gone. That was thought impossible." It was only after repeating the experiment three times that Kinley finally "admitted to myself that we had found a seaweed that was eliminating methane, virtually completely" – and in a concentration low enough to be economically viable.

Asparagopsis works by preventing carbon and hydrogen molecules from bonding and forming methane in cows' digestive systems. Kinley explains: "Methane is produced in a pathway that uses enzymes. And at the last step in that pathway, there's an enzyme we are able to intercept with the bioactives in the seaweed. The seaweed disables the enzyme so that methane is never formed."

At FutureFeed, Kinley is working to help build an industry and infrastructure that would allow *Asparagopsis* to become a standard part of cattle feed. The company won a US \$1 million Food Planet award for its work, and is using the money to develop land-based seaweed production and involve Indigenous populations in *Asparagopsis* production.

FutureFeed does not grow seaweed itself, focusing instead on research and development, and licencing the intellectual property.

So far, FutureFeed has licencees in Hawaii, South Australia, New Zealand, the Philippines, and Sweden. And the company was finalizing a Canadian agreement late last year.



By adding seaweed to feed, "we can reduce feedlot cattle to almost no emissions of methane at all," says Dr. Robert Kinley, chief scientist at Australian company FutureFeed.

While it was the methane-reducing qualities of *Asparagopsis* that first impressed Kinley, he has come to appreciate its other benefits as well. "Let me give you this little bit of a spiel about seaweed," he says, warming up to his subject. "When you grow seaweed, you can clean the water where you're growing it. It's a bio-filter. Where you have areas of agricultural runoff or finfish and shellfish farming, you have excessive levels of nutrient, and without cleaning it up, it becomes a pollutant. So you can grow the seaweed and clean that up while getting a secondary product of value — and you can do it in areas where there are Indigenous land and water holdings."

In areas where fisheries have collapsed, Kinley says the infrastructure can be put to use growing seaweed. In fact, it's already happening.

"We're doing it here in Australia, with the Narungga Nation, in South Australia. You're using local labour and providing new economies. You then produce a product to reduce methane emissions and improve the profitability of the red meat and dairy industries. So it's a long chain of benefit."

But that long chain of benefits still rests on the key finding that *Asparagopsis* may be able to help transform cattle farming into a more carbon-friendly industry. "Cattle are producing large amounts of methane. It is the largest emissions contributor for the agricultural sector, and it can be controlled, so it should be," Kinley says. He recognizes that *Asparagopsis* alone is not going to solve the problem, since the industry is still in its infancy. But it can make an impact.

"This seaweed can bring agriculture and livestock production to the forefront of emissions reductions and can be a contributor to reduction of the carbon footprint of the wider agricultural sector," Kinley says. "Knocking down that methane is a very big deal."

**Have plenty of
vegetables and fruits**

Eat protein foods

**Make water
your drink
of choice**



**Choose
whole grain
foods**

A climate villain?

Look at just about any popular media article on personal changes you can make to save the planet, and near the top of the list you'll likely see cutting out meat — or at least decreasing meat consumption dramatically.

But is animal protein the climate villain it's made out to be? And can we continue to eat meat in a way that's sustainable?

<https://food-guide.canada.ca/en/>

Three researchers in the Animal Science and Aquaculture Department of Dalhousie University's Faculty of Agriculture agree that when it comes to feeding a growing global population, animal protein is part of the solution. But they also say animal production industries can improve on their greenhouse gas emissions and other factors related to sustainability.

"It's not sustainable to just be growing plants, because we will either starve, or the soil system won't be able to handle all the plants we need to grow," says Dr. Stefanie Colombo, Canada Research Chair in Aquaculture Nutrition.

Agriculture is a significant contributor to greenhouse gas emissions, accounting for about a quarter of all emissions globally, Colombo says. So with demand for animal protein rising, it is essential that producers continue to improve efficiency and lower emissions.

That's been the trend for decades in beef production, says sustainable livestock production system Dr. Ghader Manafiazar. (He notes that measuring emissions is challenging, citing a project that employed 17 people and spent \$2.5 million to study how much methane 1,000 cows produced.) Forty-five years ago, Canada had some 10 million beef cattle. That number has dropped by more than half, while beef production has increased. More importantly, farmers are getting these efficiencies while reducing the total amount of feed.

"There is a correlation between feed intake and carbon footprint," Manafiazar explains, "because when animals take in more, they digest more and at the same time produce more methane. So if they eat less, we are able to reduce their contribution to global warming."

But Manafiazar is also researching more high-tech options, including using machine learning to develop an algorithm that could predict methane emissions based on genetic traits, "to see if we can find some kind of prediction equation." Cattle could then be bred with the desirable lower-emissions genetic profile.

Department chair and poultry Dr. Bruce Rathgeber also points to ongoing improvements in layer and broiler hen production. He says there have been times when "performance has overlooked the impact of welfare," but that there is a better balance between the two today. Rathgeber says it's important to move forward in a measured way, to avoid unintended consequences. For instance, when the European Union banned antibiotics in broiler hen feed, the overall use of antibiotics went up, as prescriptions for sick birds increased.

For Rathgeber, that points to the importance of an integrated approach: not just eliminating antibiotics but also "reducing density in barns, managing the bedding better so that bacterial proliferation is managed. Farmers became experts in a lot of other



Dalhousie Faculty of Agriculture researchers discuss the sustainability of animal agriculture. L-R: Dr. Stefanie Colombo, Dr. Bruce Rathgeber and Dr. Ghader Manafiazar.

aspects and moved away from relying on a drug to take care of a lot of things for them. There's a lot of learning going on."

For Colombo, feeding the world means paying much more attention to blue foods – animals, plant, and algae that grow in the water. "Blue foods are a powerhouse," she says, not only because of their benefits to human health, but also for their environmental promise.

"Farmed aquatic foods have lower greenhouse gas emissions than a lot of crops and industrial livestock production," she says. "We need to harness the power of the oceans and reduce some of the environmental footprints overall of the food production system. We can do better, and that's by producing more aquatic based foods."

As with other forms of animal production, aquaculture has made mistakes, Colombo says. She points to early pelletized farmed salmon feeds as an example. "They were fed a pellet, like a dog kibble, originally harvested from wild fisheries like sardines and anchovies, and then ground up and made into fish meal and fish oil. Salmon are carnivores, so nutritionally for them that was perfect, but it made no sense: you can't harvest wild fisheries like that to make a fancy fish like salmon." Today, she says, the amount of fish meal and fish oil has been dramatically reduced, and farms are using more "upcycled" ingredients, like spent brewery grains which can be cultured to grow micro-algae.

And we need to think beyond the species we are currently raising. She cites striped bass as a species "is on the cusp of becoming a sustainable industry in Nova Scotia."

Whether on pasture, in barns, or out on the water, there are still more gains to be made.

Overall, Manafiazar says, North American livestock industries have "done a really good job" of lowering emissions. For instance, the CO2-equivalent emissions of a kg of Canadian beef are less than half that of Brazilian beef. "We are among one of the countries with lower carbon footprints," he says. "But the point is, that doesn't mean we don't need to take action."





A standard of care and excellence

As the only Agricultural Campus in the country with a working on-site farm, significant opportunities and resources are provided to faculty, staff, and students in the areas of teaching, research and extracurricular activities.

The Farm complex serves the needs of the Faculty of Agriculture and includes active animal production systems in dairy, poultry (broiler, layer, and turkey), sheep, mink and aquaculture.

Each animal unit adheres to specific and relevant animal welfare codes and standards of practice and researchers, staff and students are dedicated to animal welfare and the sustainability of animal agriculture.



"The staff deeply care for the animals, and this is incorporated into the way they work," explained university veterinarian Dr. Chris Harvey-Clark. "They then mentor students in the same way. The practice of stockmanship on the agricultural campus is second to none," he added.

By using good stockmanship practices animal care is improved and safety for people and animals is also improved.

Commitment to Animal Welfare

Animal welfare seeks to improve the expression of natural behaviours and the physical and mental well-being of animals managed by humans.

A Certificate in Animal Welfare available on the Truro campus aims to help students gain specialized knowledge on the well-being of animals managed ethically by humans. The certificate provides a range of theory, evaluation of scientific literature, and its application surrounding the use of animals. The program prepares students for careers in animal health and welfare by giving them expertise specific to this field.

A student Code of Conduct and Animal Welfare Commitment also ensures students are directly responsible for the animals with which they are in contact.

"I want students who complete the Certificate in Animal Welfare to develop an interdisciplinary awareness on the ethics of animal use and develop the skills required to assess welfare issues objectively in a scientifically credible manner," said Dr. Miriam Gordon, animal science instructor.

Animal Care and Practices

All those involved in the care of animals on the Agricultural Campus follow standards of care provided by various organizations including the Canadian Council on Animal Care (CCAC) and the National Farm Animal Care Council (NFACC). The NFACC is the only organization in the world that brings together animal welfare groups, enforcement, government, and farmers under a collective decision-making model for advancing farm animal welfare. The NFACC provides an animal care assessment framework for which species-specific industry animal care assessment programs are based on.

A new development in Canada in the past year has been a new code of practice published, *For the care and handling of farmed salmonids* by the NFACC. This updates many of the welfare standards for salmonid fish, specifically, but can be applied to other species too. Dr. Jim Duston was part of the Farmed Salmonids Code of Practice Scientific Committee and Dr. Chris Harvey-Clark was a Code Development Committee Member.

Dr. Chris Harvey-Clark and Dr. Jim Duston, Professor, Finfish Aquaculture are members of the NFACC, and Dr. Harvey-Clark is working with the CCAC to update and replace their codes.

Current Research

Current research being undertaken by Dr. Rebecca Meagher, assistant professor in Animal Welfare, includes a mink project identifying optimal environments for long-term welfare and behavioural development of kits and a dairy project to help understand the natural behaviour and stress response of newborn dairy calves. The goal of her work is to improve methods of welfare assessment, and determine what stimuli need to be provided to animals to improve well-being on farms.

"I think research like this is important because we have a responsibility to manage animals in the best way we can when they're under our care," says Meagher. "This is about making farms more efficient by getting rid of some of the welfare problems that can inhibit production, but it's also about the social sustainability of the industry and developing farming systems that everyone in society is more comfortable with."

Dr. Meagher also participated on the committee for mink code revision completed in 2021.

Facility renewal

To support essential research on campus and to educate the future leaders of this industry, constant renewal of the farm complex is essential and an ongoing priority for the university.

Continual upgrades are being made in areas of animal comfort and to mimic a more natural habitat including bedded pack pens for transition cows to reduce stress during calving, sand pens for rehabilitation, plans for colony cages in poultry,



condo pens in mink, environmental enrichment for poultry and mink, redistributing warm water from the plate cooler to cows for drinking and more.

Future development plans could include a precision animal management centre and a sustainable digital aquaculture centre which would see new facilities and the latest industry technologies designed to support research, development and teaching that reflects industry realities and aspirations.

"We are always practicing excellent animal husbandry on our campus with intentions of being a regional centre of excellence for the industry," explained Dean Dr. David Gray. "Constant renewal of facilities is a priority not only for our animals and our research, but for the education of our students who will be helping to sustain an industry on the precipice of exponential growth."



Q & A with Dr. Kathleen Kevany

Dr. Kathleen Kevany is an associate professor and director of Rural Research Collaborative with Dalhousie University, Faculty of Agriculture, where she specializes in sustainable diets, well-being, and systems analysis. She is on advisory boards for Canadian Food Studies, and Journal of Agriculture, Food Systems, and Community Development. Kathleen is the President of the Canadian Rural Revitalization Foundation. She is the editor and co-author in *Plant-based Diets for Succulence and Sustainability* (2020), and she has been commissioned to lead the world's definitive guide on sustainable diets.

How will we feed the growing population by 2050?

Modern food systems, along with traditional farming practices, are producing more and more food for a growing population. The Ontario campaign, "*Farmers Feed Cities*" worked to educate consumers about their food and their farmers. A new campaign, "*Good in every Grain*" seeks to shine light on the benefits from this agriculture. To feed more people, we must plan for more food with fewer resources and less adverse impacts. Foods with higher nutrition and greater efficiencies should be prioritized.

What needs to change to make this possible?

To assess how well our food production and consumption policies and practices are meeting human and planetary needs, we require an understanding of systems analysis. Insufficient attention has been placed on the mounting undesirable health, environment, and social concerns associated with our food systems.

With increasing fluctuations in climate, we are seeing devastating floods, heatwaves, droughts, and other impacts that reduce yields, increase food prices, cost lives, and damage ecosystems. Global targets of no more than an average 1.5°C increase in global temperatures over pre-industrial levels will not be possible without significant changes to our food systems, including reducing meat and dairy consumption.

The prominence of animal products in Western dietary patterns has been identified as a significant driver of global warming. Other environmental problems to which animal agriculture contributes include deforestation, habitat and biodiversity loss, environmental and soil degradation, and ocean dead zones. Climate impacts on human, animal, and planetary health are going to intensify.

Food is being grown and produced for human satisfaction and nourishment. Assessing how well nourished we are, is an important question to consider. The increasing consumption of dairy, red, and processed meats has been shown to be a primary driver of non-communicable diseases, such as obesity, coronary heart disease, high blood pressure, and cancer.

Increasingly, plant-based proteins are being proposed as valuable alternatives to animal-based proteins. Consumption of the whole, plant-based foods for protein, vital nutrients including fibre, aids the body in digesting these proteins and with eliminating waste more effectively from the digestion track. Plant-proteins also serve to lower LDL cholesterol which is linked to lowering the risk of cardiovascular disease. This is very interesting, especially when considering that coronary heart disease is the second leading cause of death in Canada. Due to the lower caloric density of plant-based protein, mainly due to the low-fat content and high fiber content, plant-based proteins are known to cause weight loss.

How and in what way can we become more sustainable – now and in the future?

Based on the best available evidence, Health Canada introduced Canada's Food Guide in 2019, which emphasizes diets high in fruits, vegetables, whole grains, nuts, and seeds, and low in sodium, red meat, dairy, meat, sweetened beverages, and trans-fats.

Reports are accumulating around the benefits that a largely plant diet confer. The famed EAT Lancet report calls for largely westernized diets to reduce, in half, their animal consumption and increase by more than 200 per cent the consumption of fruit and vegetables. Canadians must also become far more conscious of food waste and learn to prevent and avert such waste.

Applying these findings can help feed more people effectively, efficiently, and equitably. Accelerating the adoption of such guidelines seems to be a rational policy priority, as they also reduce dietary risks associated with disease, premature death, and disability, while emitting less greenhouse gas emissions and lessen environmental impacts. In these critical times, researchers, practitioners, and educators must be prepared to assess food systems and modify approaches that undermine socio-ecological sustainability.



Improving food systems literacy, including nutritional knowledge and the ability to apply this knowledge can help to advance a variety of social goals. It is connected to improving human health and reducing disease, reducing global warming and improving sustainability. Policy makers, producers, processors, retailers, and consumers all have roles to fill in fostering more sustainable food systems.

What role does animal agriculture play in feeding this growing population?

Farmers, ranchers, landowners, and food producers play significant roles in providing important social and environmental goods and services.

Protecting lands, maintaining woodlots, conserving bio-diversity and maximizing water are some of the valued contributions from agriculture, in addition to food production. Animal food products that contribute to feeding a growing population, protecting planetary systems, and meeting consumer standards for animal welfare, will be those most supported by policy makers and investors.

These practices need to be assessed through more fulsome measures of the footprint, including the broad impacts, of animal agriculture. Animal agriculture that will play the biggest roles in the decades ahead are those that involve agro-ecology, silvopasture, regenerative agriculture, conservation agriculture, composting, and organic approaches. All these strategies provide substantial economic return, while reducing greenhouse gas emissions, and offer other environmental benefits. Tree intercropping as well as measures around nutrient management, also are critical contributors to more sustainable food production systems.

Feeding a growing population, sustainably, creatively and efficiently will require innovations across our food systems. Food producers are at the centre of this role, and we look to them for leadership and thank them for their contributions in nourishing the world.

Sunni Knoll Farms

van de Riet Family

There's been lots of changes happening at Sunni Knoll Farms, in Shubenacadie, NS. Especially as the operation slowly switches from the second generation of van de Riet's to the third, and even looking ahead to the fourth.

In the fall of 2021, John (Class of '80) who farms alongside his son, Joey and family, installed two robotic DeLaval VMS milkers. The significant technological upgrade to the way in which they milk their 110-cow herd has changed the way they farm and their lifestyle, but most importantly, improved overall cow health.

"The cows here no longer work 9-5," says second generation, John. "They are now self-employed."

The system, which went online on Labour Day, is a voluntary system allowing the cows to milk as they feel the need. It has not only increased cow comfort and wait times, but it is also less disruptive.

"It has improved our quality of life as well as the cows," added John. "We spend more time with the animals now but its more quality time. We are not just using the animals to make a living. A better life for the cows means a better life for the farmer."

John purchased the farm from his parents and grew the operation, over the years. Joey always wanted to be involved on the farm and after attending NSAC, as well as spending time working on farms in Australia, eventually returned to Sunni Knoll with a real interest in growing crops. Working together the farm is now fully sustainable.

"We are now growing over 600 acres of forages, corn silage and grain, wheat and soybeans," says Joey.

As the third-generation, Joey lives with his wife, Sarah and their three children on the farm, and has a passion for cropping and a desire to make milking more efficient. He is also the one managing the app, on his phone, connected to the robots.

"The cows here no longer work 9-5," says second generation, John. "They are now self-employed."

"It was hard to get used to at first, but the app can tell us who has been milked, how much milk they gave, who attempted to be milked and who still needs to be milked," he explained. This information is vital to maintaining efficiency and enabling the farm to keep and maintain a smaller quality herd. It will also inform of any abnormalities and pre-detection of illness such as mastitis.

"It's busy, but a different kind of busy," said Joey. "We can spend more time monitoring the health of the animals."

Adjusting to the robots was a short three-week period for the cows. Taking shifts, the cows moved in three groups to ensure all were milked within a 24-hour period. Food entices the animals to the milker and keeps them in place, while a small burst of air sends them on their way, allowing the next cow to proceed.

Timing was of the essence when the van de Riet's added the new robotic system. The first robot was installed, in a new space and fully functioning on one side of the barn, for half of the herd. With the second robot, the rest of the herd was milked in the morning, from the original parlour. When milking finished, immediate demolition of the parlour began, cement was poured, equipment moved in to be installed and by evening, the second robot was functioning. To accommodate the new technology, 12 feet was added to one side of the barn, and eight feet to the front.

The van de Riet's were so impressed with the addition of the robots that in late November, a robotic manure scraper was added to the "staff".

"Cow comfort is a priority," explained John. "The heifers utilize comfort mats while the older ladies lie on sand. "Even the robotic manure scraper will be less disruptive than a human being present."

Every decision on Sunni Knoll farm is based on what is best for the farm and for the family.

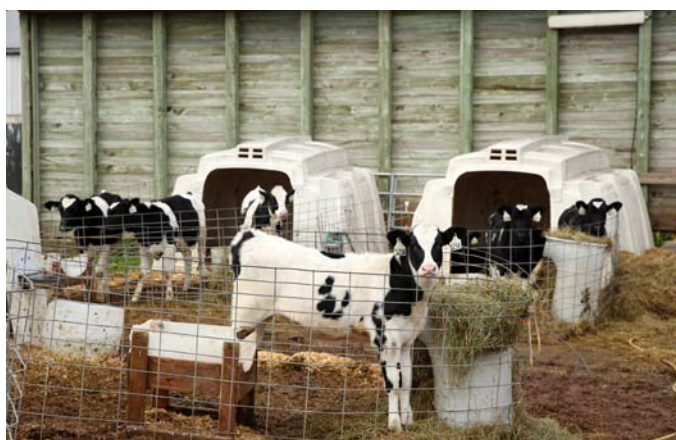
"It is such a privilege to be a dairy farmer in Nova Scotia," added Joey's wife, Sarah. Sunni Knoll is one of over 200 family-owned dairy farms in Nova Scotia, producing over 200 million litres of milk, annually.

With recent events around food security highlighted by the pandemic, the importance of sustainability is at an all time high.

"We want Nova Scotians to appreciate the products our farmers have to offer and to be proud of where they came from," she added.

The extended family recently went out to dinner to celebrate John's birthday — something that never would have happened prior to the transition to robots.

The future is looking "sunni" for the van de Riet's.



Maple River Farms

Samantha Haley

Samantha Haley (Class of '13) is passionate about two things — fertilizer and fibre. And she's very quickly found a way to turn her passion into a successful value-added business. Last spring, Sam was presented the Minister's Award of Excellence, from the NS Department of Agriculture, for Outstanding New Entrant for her work and commitment to agriculture.

"Two years ago, I brought home two llamas, for no reason other than I really wanted a llama," laughs Sam of what may have seemed like a crazy decision. "Back then, I couldn't have imagined where I would be today."

Raised on a blueberry farm in Antigonish County, NS, Samantha was involved in 4-H and had horses. But she always dreamed of having a pet llama. After graduating from the Faculty of Agriculture with her diploma and then degree, Sam secured employment, purchased a small farm property and made her dream come true.

Maple River is a small family farm that focuses on producing llama wool and value-added manure products. It is the biggest llama farm east of Ontario and the only registered llama farm in NS. Sam is a young leader in agriculture who started her business during a global pandemic while she was five months pregnant.

Maple River Farm is home to eight llamas, three alpacas, 11 sheep, two goats, five dogs and of course, Sam's two little boys (aged four and two). The llamas and sheep are Sam's beloved pets, but they are earning their keep too.

"Like sheep, llamas are sheared once per year," says Sam. "Llama wool is quite rare, soft, hypoallergenic and has a high market value."

When Sam is not producing her own llama (or sheep) wool, she processes for others or sources raw wool, to finish herself.

"It's not economical to dye my own llama wool, because of the extensive steps involved," says Sam. "The cost would be too high."

Producing wool is a labour-intensive feat, as is creating the bi-product, yarn.

"Once the fibre has been extensively cleaned and dried there are still many steps to go. The wool goes through a machine that has large teeth, which open up the fibre. It is then carded, which creates a batt of wool," explains Sam. "Once there is a long and narrow bundle of fibre, called a roving, you can start the spinning process."

Using her custom-made wheel, from New Zealand, Sam spends countless hours spinning the wool. With a spool of fibre, Sam fills custom jobs, or uses her own creativity to dye the fibre into unique colour pallets. Sam sells her llama yarn and hand-dyed products from her Etsy store and local Farmers' Markets.

Depending on her workload, you can also find Sam's handmade llama shawls, hats and other goodies under her "Fert n' Fibre" brand.

It may not sound like a goodie, but the other half of Sam's "Fert n' Fibre" brand is value-added manure products.

Sam sees the value of using the manure from the llamas to raise awareness of agriculture and the importance of planting seeds. She came up with her branding for the manure, sourced environmentally friendly and biodegradable packaging, and started advertising on social media.

She has several value-added ways to sell manure — in small bags of fresh llama beans for house plants and in two-pound bags of broken-down manure for gardening and transplants. Premixed bags of soil and manure are sold with local seeds and terracotta pots for flowers and herbs. Her products are now selling at five farmers' markets throughout the province.

"Llama beans, or llama droppings are such an excellent source of fertilizer," explained Sam. "They are one of the highest yielding natural nitrogen sources produced from an animal, even higher than chicken and cow – second only to rabbit. They are also high in phosphorus and potassium."

Llama manure can be applied to plants of all stages of life as it is not a hot manure. This means, it will not burn the plants when they are young and developing.

Sam's llamas are kept on a well-maintained nutritional program to ensure all their dietary needs are met and the manure meets the guaranteed analysis.

"The fertilizer is naturally produced, from very happy llamas and is a renewable source of nutrients for your plants," adds Sam. "The beans are collected on a daily basis, from stalls and pasture to be run through an intensive cleaning and break down process."

Even though caring for her critters (children included) and creating products for Fert n' Fibre keeps Sam busy, she also splits her time working for Belchim Crop Protection and Scotian Gold.

You can find Sam and her products:

Facebook @mapleriverfarm.ns

Etsy and Instagram @mapleriverfarm



Church Street Vineyard & Winery

John Eikelenboom

Regret Nothing is a blend of everything John Eikelenboom has made in the past year at 1365 Church Street Vineyard & Winery and is a bold testament to the shift in the way he farms.

"I became a farmer when I was four and a half years old," says John as he recalls his first cow. "When I was 11, I started livestock auctioneering and when I was 19, I purchased my parents dairy farm, the same year I graduated from NSAC."

Now, over 40 years later, John is still wearing overalls and stewarding the land but now is growing grapes and selling high quality wine in Port Williams, NS while also greeting guests in his on-site tasting room and providing tours of his operation.

"I've gone from John the dairy farmer to John the wine maker, growing grapes on what was an apple orchard, on a property we have restored and converted to a winery," he explained.

Although it's John's first year with the tasting room and selling wine from 1365 Church Street Vineyard & Winery, his wine making goes back nearly 17 years.

"I planted grapes on the family farm and began making wine after completing the grape growing program at the Nova Scotia Community College."

John purchased the property, in Port Williams, in 2015. He spent six years planting over 14 acres of grapes, making wine and converting the original (and rustic) apple barn into the coziest wine tasting room, complete with a loft and deck with beautiful view of North Mountain, Wellington Dyke and Cape Blomidon. John also worked away at constructing a climate-controlled barrel cellar, where red wines age in cedar barrels for three-five years, as well as a climate-controlled ambry, to store products ready for market and consumption.

"After several delays, 1365 Church Street Vineyard & Winery, officially opened to the public on Valentines Day 2021," says John. "In the first year, we've hosted private events, weddings,





eager tour groups and individuals in no rush. We grow eight-nine varieties of grapes and currently have 13 different bottles of wine on our shelves."

The wine industry in Nova Scotia is rapidly growing, resulting in a world-class tourism destination and contributing to a growing and diverse economy. Wine Growers of Nova Scotia represents 19 grape wineries, located in seven wine regions across the province, producing more than 21,000 cases or just under 1.9 million litres of wine per year.

"The Annapolis Valley, in particular, is ideal for wine making because of the early spring, warmer summer temperatures and better drainage," says John.

There are over 90 grape growers in Nova Scotia and over 70 different grape varieties planted in the province.

To guests, the experience at 1365 Church Street Vineyard & Winery is unique. The vineyard is adorned with various bicycles, the wine tasting room is decorated with beautiful bicycle art and bicycles are incorporated into the branding.

And John has even bottled the symbol, a nod to his Dutch roots — Eight Bikes Red and Eight Bikes White are blends of John's grapes, available to taste or purchase.

But John isn't worried about setting his product apart from neighbouring vineyards. "I just want to make good wine and be a good steward of this land."

Although John is no longer tied to regular milking times, his days as a wine maker are equally as busy. "We blend grapes all year long creating new wines to bottle, we test the barrels monthly, in the fall and winter we prune vines trying to stay ahead of the winter weather and the winery is open daily to welcome guests and provide tours."

"We have to hustle for the sales, you just never know when someone will walk through the door looking to purchase product for say a wedding," says John.

Despite the hard work and few set-backs, John already has plans for the next season and ideas to grow.





A black pig is shown in a forest setting, standing on a bed of brown leaves and twigs. The pig's body is dark and slightly hairy, with some lighter patches on its legs. The background is a dense forest with many thin, light-colored tree trunks and some green foliage visible in the distance.

Snowy River Farms

David & Amy (Bent) Hill

Decisions made at Snowy River Farms aren't always economical, but they are made with consideration to their impact on the environment and sustainability.

"They are raised on a diet of fresh grass, vegetables, fruit and non-GMO grains," says Amy. The fruits and vegetables are discarded from local stores and restaurants. "The decomposition of food waste (leading to methane being released into the atmosphere) is one of the ways our conventional agricultural system is unsustainable."



"We don't want to just produce food," admit owners David and Amy Hill. "We want to have a connection to our food, while leaving something behind for our kids, doing the least amount of harm to the land."

Which is why David and Amy operate their small family farm, in Cooks Brook, NS, committed to providing consumers with pasture-raised products, created in a humane and ecologically friendly manner while also trying to be as wasteless as possible.

"We don't want to participate in waste," says David, a red-seal carpenter who brings his trade skills to the operation, along with his years spent at NSAC. Since purchasing the property from Amy's grandparents in 2012, David has renovated the existing outdated and unused structures, giving them new life and purpose as well as building new barns including the one the Snowy River Farms free range chickens call home.

"We repurposed a lot of unwanted construction material when building this structure," says David. "Not only does it save us money, but it's using materials that would have otherwise been sent to the landfill." While the chicken house may sound thrifty, the birds are living their best life, in style.

"It's nicer than our home," laughs Amy. The interior of the chicken barn is finished with Italian tile, leftover from an apartment complex build. The structure itself is insulated with pieces of exterior doors, repurposed straight from the manufacturer, and the steel roof was salvaged from an old mink farm that was being torn apart.

When not inside, the chickens enjoy rotating between four long, narrow outside pens, on a weekly basis. The layout keeps them safer from predators, such as eagles, and rotating pens ensures fresh grass to feed on.

Further up the sloped property, Snowy River Farms pigs graze in a wooded area, all year long. The hogs also rotate in pens, of nearly $\frac{3}{4}$ of an acre each, with ample trees for shelter, as well as huts. "They are able to root and play as they would naturally, in the wild," adds Amy. "We receive piglets at the age of two-months. They spend one-month in the barn before they join the rest of the herd. The older pigs teach the younger ones how to behave and stay safe."

Snowy River Farms hogs eat well too.

"They are raised on a diet of fresh grass, vegetables, fruit and non-GMO grains," says Amy. The fruits and vegetables are discarded from local stores and restaurants. "The decomposition of food waste (leading to methane being released into the atmosphere) is one of the ways our conventional agricultural system is unsustainable."

The farm's laying hens live a similar life — grazing on grass, rotating pens, consuming GMO-free grain as well as discarded fruit and vegetables. They also enjoy enrichments such as sandbathing and a shelter with natural perches.

At processing time, there's nothing funny added to Snowy River Farms products — livestock are raised without the use of synthetic hormones or antibiotics, their produce is grown

without the use of synthetic fertilizers, herbicides, pesticides or biosolids, pork and chicken products are gluten free, and their sausages do not contain fillers. All resulting in happy returning customers.

"We can't raise enough pigs," says Amy. Two days after processing, they sell out. "For how we raise our pigs, we can't add to our herd. We won't raise more animals just to make money and ruin the land." Eggs and free-range chickens are just as popular.

Aside from being raised for market, the livestock at Snowy River Farms also has a role to play in the other component of the farm — the growing of fresh, seasonal produce.

"We are moving towards no till," says Amy of the way in which the land is prepared to grow produce. "First, the land serves as a pasture for the pigs. They root, which tills the land, and their pee and poop is an excellent, natural fertilizer."

Soon, a variety of fruit and nut trees will be planted among the free-range chicken pens. "The chickens will provide fertilizer for the trees, they will peck at the base of the trees, which keep disease away. In turn, the trees will provide more protection and the chickens will consume the tree droppings," says David.

Snowy River Farms products are sold through one of three CSA options, online or through the Truro and Halifax Farmers Markets.

"We fill a number of wholesale orders too, supplying restaurants and stores in the Halifax area," Amy says. "The microgreens, which we grow from seed all year long, are very popular to restaurants. We harvest and deliver, weekly — from kale, broccoli, radish, pea shoots and more."

Products can also be purchased on-farm. During peak produce season, David and Amy regularly greet customers on their property, pulling their requests directly from the soil.

"Our location is pretty ideal," adds David, saying it was also a factor in purchasing the family land. "We are 45 minutes to Halifax and 35 minutes to Truro. This means we can supply our customers with the freshest possible product."

Although the farm was in Amy's family. She didn't exactly have farming experience. "I was raised in Dartmouth," she says. "Every summer, my family would vacation on a farm property in PEI. I grew up thinking farming was a vacation."

While attending NSAC, Amy took an interest in organic courses, as well as a particular male student — David. It was there that Amy knew she wanted to produce her own high-quality food. David had farm experience in his blood and grew up loving the movie, "The man from Snowy River." Eventually they married each other and their interests, resulting in Snowy River Farms.

While Amy no longer attributes farming to vacationing, she's doing what she loves alongside David and their two young children. Together, they are proud of their products, and their sustainable farming practices.

Ashcroft Angus Farms

Lisa (Wilkinson) & Scott MacEachern

Lisa (Class of '93) and Scott MacEachern have a mission to provide Nova Scotians with plentiful quality, locally, sourced beef – a problem amplified even further by the pandemic.

Since their family farm, Ashcroft Angus Farms, located in Bailey's Brook, NS, was founded in 2015, they have been doing just that.

"We naturally raise 100 percent Canadian Black Angus cattle, producing premium Black Angus beef for Nova Scotians," says Lisa. "And we stand behind our tagline — Premium. Pasture to Plate."

Naturally, consumers are conscientious about their beef consumption and want it to be from humane, sustainable, and hormone-free environments. The over 80 registered Black Angus herd, at Ashcroft Angus Farms, happily roam pastures spanning over 1,000 acres for grazing and are supplemented with oats, hemp and haylage, grown on the farm. No hormones or antibiotics are added.

"Daily, from April — November, we follow a carefully constructed plan, keeping our pastures at their highest nutritional quality for the herd," says Scott. Which Lisa admits, Scott has down to a science!

Even in the winter, the Ashcroft cattle roam in a pasture that "has it all", so to speak. "You name a possible wind direction, and the herd will be fine," says Lisa. "Black Angus are an amazing breed in the elements, knowing just where to head for shelter in the storms and when to head for hay or a drink."

During the winter months, the family feeds several bales, each weighing well over one-ton, every few days, depending on severity of weather. When the ground is not frozen, Scott and Lisa regularly move the feeders around, so the herd has good footing. Their two youngest children, Dainelle (22) and Vaughn are on call for refilling feeders - a one and-a-half-hour chore, each time it must be done.

In the spring, Scott and Lisa look forward to getting their herd onto the pasture as soon as possible. Similarly to knowing what to do in the winter, the cattle are equally intelligent come calving season. Danielle and Vaughn ensure the fencing is mended, the first task of their summer job on the farm. "But Black Angus are amazing mothers," adds Lisa, "other than finding the youngsters and tagging them — a task mastered by Danielle and Scott, the mothers do all of the work."

Scott and Lisa admit the six horses and hens, who also call Ashcroft home, take more of their time and work, than the cattle. But being fairly self-sufficient leaves more time for Scott, Lisa and their three university-aged kids to focus on the cattle's health.

"Every day, year-round, our processes are focused on the overall health of our livestock," says Scott. "From feeding and watering, to cleaning and moving."

Herd health day takes place annually, in June. "Part of the pasture is turned in to a clinic and we perform all herd health, all in the one day," adds Lisa. "This is often the only time the vet is needed." The entire family and the kids' friends are on-site to help, it's one of the longest days of the year," Scott says. "The crew is on pasture with the herd from dawn to dusk."

Along with herd health, sustainable animal agriculture is a priority to the MacEachern family. They believe it is vital when considering an ethical method of meat consumption. "The term sustainable agriculture entails that the animal's life is valued by the farmer," says Lisa. "We can see this in the quality of the beef when compared to an animal that consumes a high grain, or corn diet, as opposed to a diet high in green grass."

"On our farm, an animals' life is not taken until there is a customer who requests it, and is prepared to consume the meat," adds Scott. This eliminates waste, while ensuring the meat is fresh and extremely nutrient dense in comparison to beef that is manufactured with solely profit as its purpose. "It's quality over quantity for us."

And the whole family believes in these practises.

"If agriculture continues to exist, consuming beef in a sustainable way is the only method. Especially if you want to be integral about your diet and the animals you consume," says daughter, Emily. "Integrity ensures that nothing is wasted, morals are considered, and beef is of quality."

Owning and operating Ashcroft Angus Farms, alongside their children, is a dream come true for Scott and Lisa. High School sweethearts, the couple ran a successful aquaculture operation, growing rainbow trout, for many years. But Scott, raised on a farm and Lisa, who attended NSAC, always wanted to have a family farm.

"Family farming keeps the family in touch with their herds, crops, nature and each other," says Lisa. "The farm life puts a unique perspective on life each and every day, we wouldn't have it any other way."

Scott and Lisa are members of the Canadian Angus Association and are active in the farming community in their area. Now, and in the future, they are committed to being advocates for Nova Scotia agribusiness, providing Nova Scotians with premium quality beef and having strong relationships with their customers.

Order Scott & Lisa's best selling AAA pack before the end of April, use code ALUMNI and you will be entered into Ashcroft Angus Farms alumni giveaway (\$100 value). Winner will be announced on their social media on May 1. Prize must be picked up in New Glasgow, NS.

Ashcroftbeef.ca





Maxine Gourley Memorial Scholarship

Like anyone involved in agriculture, Maxine Gourley (Class of '69) was not afraid of hard work and was determined to create her own farm. Although she lost her husband at a very young age, she persevered, building a home and a farm to share with her parents and uncle.

During the day, Maxine worked at various banks in Truro, Stewiacke, and Shubenacadie, where many grew to know her. She attended NSAC to learn more about animal husbandry. Her education helped her start her beef operation. Maxine loved farming and her white cows were often referred to as the best beef cows around.

Maxine did not stop there. She maintained a garden every summer and chopped and stacked her own firewood every winter. She made sure to make time for the people and things she loved as well. She would often share preserves and produce from her garden with friends, family, and even the nearby deer. Maxine would take time to walk through the woods near her house in search of her favourite flower, violets, as well as the elusive lady slipper. She also spent some of her time relaxing on her deck watching wildlife come and go, and although she never got the chance to see one, she always enjoyed keeping an eye out for a cardinal to stop by.

Maxine was truly an all-around good person who always thought of others first. She passed away in January 2021. Her down-to-earth, no-nonsense approach to life will be sorely missed, but never forgotten. To remember Maxine and share her story, The Federation of Agriculture developed a scholarship in her name for her service to both the Stewiacke and the Colchester County Federations of Agriculture for more than 25 years.

The Maxine Gourley Memorial Scholarship was established in recognition of her outstanding commitment to agriculture in these regions, and to provide \$1,000 to support local students pursuing agricultural studies, especially those interested in beef and female students.

The first recipient, in fall 2021 was Emma Shive, a second-year student in the Pre-Veterinarian program.

"I am extremely honored to be the first recipient of the Maxine Gourley Memorial Scholarship," said Emma. "I am thankful to the Federation of Agriculture for making this all possible. This award and what it stands for is truly inspiring and encourages me to be a better person. Maxine Gourley had an obvious impact on her community. Her dedication to her animals and her passion for the world of agriculture has touched so many people including myself."

Through this scholarship Maxine continues to be able to have an impact on students and the agricultural industry.

"As a pre-veterinarian student at the Dalhousie Faculty of Agriculture, I am excited to be able to further my education and be able to share my passion for animals and science with my community. The financial support from this award brings me one step closer to my goal of becoming a veterinarian, but also gives me the freedom to be a strong female role in science and agriculture in my community," adds Emma — both model qualities that Maxine embodied and valued in others.

Blue and Gold Awards

The Blue & Gold awards were back in person in October for the first time since 2019 and guests were thrilled to celebrate distinguished alumnae Niki Jabbour, volunteer award winner Geneve Newcombe and young alumnus achievement award recipient TJ Harvey.

While guests and staff alike were thrilled to be celebrating in person, COVID restrictions were still present. All guests were masked, vaccination records checked and TJ Harvey, a New Brunswick resident, was unable to attend due to regulations in that province at this time.



Young Alumni Achievement Award TJ Harvey (Class of '02)

Coming from an agricultural background, it was an easy decision for TJ Harvey to attend the Faculty of Agriculture and earn his diploma in Agricultural Business in 2002. He returned to NB where he worked at what he knew — farming 1500 acres of potatoes, small grain, and corn. On the side, he started a trucking company, with his brother and eventually became the new entrant in the egg layer program for NB, divesting from large scale agriculture.

TJ is passionate about public service, politics and agriculture and the three have shaped who he is as a person along with his goals and aspirations. He believes everyone has something to offer – and everyone who can, should.



Alumni Volunteer of the Year Geneve Newcombe (Class of '86)

Geneve (Gardner) Newcombe may have married into the Faculty of Agriculture's strongest connected alumni family. The Newcombe family of Cornwallis, NS has been apart of the Agricultural Campus nearly since it's inception in 1905. But Geneve has humbly made a name for herself in the provincial agriculture community, and beyond.

When she's not dealing with paperwork and logistics for Cornwallis Farms Ltd, a poultry and dairy operation, now run by the ninth and tenth generation, Geneve doesn't sit idle. She's busy giving back to her community.

Geneve has three words that motivate her and keep her focussed — farm, family and faith. She is passionate about volunteering and agricultural awareness, but above all she is a proud mom to her three grown children and a very proud grandmother.



Distinguished Alumnae Niki Jabbour (Class of '96)

Since 1990 the Faculty of Agriculture has been annually honouring a graduate with the Distinguished Alumnus award. During this 20-year history, our most prestigious award has never been presented to a female. Until now.

Award winning author, radio host, social media influencer and in-demand speaker, Niki Jabbour is the 2021 Distinguished Alumnus for the Faculty of Agriculture. Niki has guided many levels of gardeners across North America, to successfully grow in small spaces and through four seasons.

View full awards citations online at dal.ca/agalumni



Members of the Class of '56, who were able to gather for their annual reunion, attended the Blue & Gold Awards.



Dalhousie Agricultural Students Association executive with manager, Pat Jeffcock, at the Blue & Gold Awards.



Musical entertainment provided by the Putnam family.



Alumni Association Chair, Colette Wyllie (Class of '10), Genieve Newcombe, Niki Jabbour and Dean Gray. cock, at the Blue & Gold Awards.

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and
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dal.ca/agalumni or by contacting
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Let's get cooking

In partnership with the Nova Scotia Federation of Agriculture, the Faculty of Agriculture hosted a Let's get Cooking event, featuring MasterChef Canada winner, Jennifer Crawford. Jennifer spent an evening speaking on culinary queerness and community while cooking alongside Amy Hill (Class of '07) of Snowy River Farms and Jason Grant (Class of '11 and '13) from Cultiv8. Together, Amy, Jason and Jennifer talked, answered questions, and worked together to prepare matzo ball soup featuring Snowy River Farms products.



Honouring our retirees

Undeniably it's the faculty members, instructors and staff that have made the greatest impact on student experience on the Agricultural Campus. They've helped shape us as individuals — advising, pushing and challenging us, guiding us to further education, or on our career paths.

We would like to acknowledge the recent retirements from our campus.

- **Dr. Alan Fredeen** – Department of Animal Science and Aquaculture (May 2021)
- **Theresa Blois** – Dean's office (January 2022)

New student orientation

New students were welcomed to campus in September, after a year of online learning. An Orientation tradition — a haybale sculpting contest, competing between houses, hosted by the Alumni Association.



Reunions



Class of '53
Members of NSAC's Class of '53 gathered in 2021 to celebrate 68 years since their graduation.



HOMEcoming 2022

Save the date for Homecoming
October 13-15, 2022 (pending Public Health restrictions)

College Royal
Blue & Gold Awards
Alumni Association AGM
Class reunions
Dean's Homecoming breakfast -and more!

If your class year ends in "2" or "7" you are celebrating an honour year reunion in 2022!
Consider gathering some classmates and initiating a reunion.

agalumni@dal.ca | 902.890.2199



Class of '56

NSAC's Class of '56 has been committed to meeting annually for many years. The pandemic caused their group to be smaller than usual, but those who were able, enjoyed getting together on campus in October 2021. Members of the Class of '56 attended the Blue & Gold Awards as a group and then enjoyed breakfast with the dean and a class meeting, the next morning.

At their meeting, class members contributed mementos to create a time capsule. The time capsule, which was made by class member, Danny Stewart, will be stored on campus and opened in 2056.

Atlantic Agricultural Interpretive Centre

It has been said many times the entire Agricultural Campus is a classroom — a living lab, teaching students and our community alike about modern agriculture. Such is also the thinking behind a new interpretive centre slated to occupy space in the recently renovated Ruminant Animal Centre (RAC).

The Atlantic Agricultural Interpretive Centre (AAIC) will occupy approximately 3,200 square feet in the RAC and will serve multiple audiences including public visitors, schools and community groups. The space will be populated with hands-on, interactive exhibits designed to provide a unique way to connect with agriculture in Atlantic Canada.

"This interpretive area has long been a vision for the Faculty of Agriculture — a way to connect and engage the broader community in all aspects of agriculture in Atlantic Canada while highlighting our role in addressing global challenges such as food security and climate change," explained Dean David Gray.

The AAIC will feature interactive and interchangeable displays with the addition of teaching and meeting space and an enhanced bio secure entrance to animal areas.

The centre is envisioned as a networking hub for faculty and industry with accommodation for private meeting space as well as office space for the Community Education Manager.

"The use of video featuring farmers and university researchers while highlighting environmental sustainability is key to engaging with our varied audiences," said Community Education Manager Lauren Peters, (Class of '19) "I'm looking forward to the completion of this facility and the myriad of ways it can help to educate our community on the future of food."

First steps

A pre-concept report was commissioned from Discovery Centre International by Dalhousie University with the Faculty of Agriculture providing a suggested content direction and development approach for an agricultural interpretive centre. Focus groups were held with a number of key stakeholders including the Faculty of Agriculture, industry and regional representatives of the Public Trust working group including participants from NB, PEI and NFLD.



First floor

Given the small space of the AAIC, the whole first-floor interpretive space will explore the concept of food and where it comes from. This overarching topic will provide the context to explore some of the current global challenges faced by the industry and some of the ways in which the Faculty of Agriculture and those working in agriculture in Atlantic Canada are addressing these problems.

"Hands-on, interactive exhibits can provide meaningful and memorable ways of engaging with the topics of food security, climate change and labour shortages," added Peters.

Second floor

The footprint of the second floor is more broken up than that of the first. It is also an area of the building that must do 'double duty' as it will serve as meeting and programming space for faculty and other agricultural organizations.

The slightly different audience for this level provides an opportunity to address a slightly older demographic while highlighting the work of the Faculty of Agriculture and helping older students make career connections. A natural extension of this direction would be to ensure that agriculture is represented as encompassing more than food.

Topics explored on this level may include careers in agriculture while dispelling any myths around who can work in the field as well as the role of university research in advancing agriculture and agriculture as a business.

The exhibits on this level would also be interactive but would include a greater number of touchscreens featuring digital content.

It is hoped the facility will be complete by 2023.



Memorial Fountain

Being near water can provide benefits for the mind and body including lowered stress and anxiety levels and an overall sense of well being.

Such was the thinking behind a new water installation on the Agricultural Campus last spring.

"Many of our employees were touched by the tragic events that unfolded across northern Nova Scotia in April of 2020," said Dean David Gray. "It has been a difficult time which was compounded by isolation created by a global pandemic," he added.

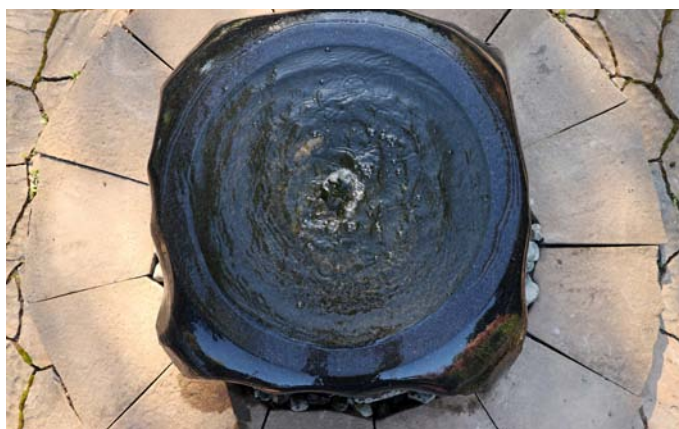
The Dalhousie University Faculty of Agriculture along with Dalhousie University in Halifax wanted to help in some small way. A water fountain was added to the John Higgins Memorial Garden in memory of those impacted by this tragedy.

The fountain is made of jet-black granite from Heritage Monuments in Windsor. It is a 30" x 24" rough cylinder with a polished top. A hole through the centre allows for the water flow. A memorial plaque at the fountain reads:

In memory of the victims of the April 2020 tragedy and their families. Nova Scotia Strong.

It is hoped the fountain provides a peaceful spot for community members to take a moment of quiet reflection.

The fountain can be found in the centre of the Higgins patio area in Alumni Gardens.





Jeff Gunn

(Class of '97)

Regional Manager,
Atlantic Lactanet Canada

Jeff Gunn was born and raised on a dairy farm, in rural Nova Scotia. Initially pursuing a career in human medicine, he switched paths when he realized it was agriculture that he wanted to be apart of. Jeff worked as the Ruminant Animal Centre coordinator on the Agricultural Campus farm from 1995-99, until he returned to his family farm, joining his father as they operated an award-winning, year-round agri-tourism — she would always take time to scan the shoreline, looking for creatures.

Jeff has also worked for Dalhousie University as a project manager on the Mink Aleutian Disease Project. In June 2013, Jeff was hired as regional manager, Atlantic, with Valacta. He is also a member of the Nova Scotia Institute of Agrologists. Farming is in Jeff's blood, and he could not imagine doing anything else.

What's a typical day like?

I am not sure if there ever is a typical day...there are never two days the same which is why I love what I do! Of course, since the pandemic began, my days are somewhat different than they were before March 2020. I spend most days managing and working with the Lactanet Atlantic Team (18 employees) made up of dairy production technicians and advisors. My team travels to farms, to be there during milkings, so they have early mornings and sometimes late evenings.

We work as a team, so there are lots of meetings to deal with the day-to-day operations. I also work with colleagues across the country to ensure that the services we offer add value to the dairy industry. We work very closely with many dairy industry partners, so depending on the time of year, I attend a lot of industry meetings within Atlantic Canada. We are also involved in a number of projects with industry groups and organizations which requires lots of communication and meetings. I also manage the sales of products and services we provide, the budget, and human resource requirements for our team throughout the year.

Why is agriculture so important?

Without it, people would not eat. I am not sure it can be said any simpler than that. Food is not only essential for life, it is an important part of our culture. Agriculture makes up the very fabric of our rural communities right across the globe, plays a critical role in our larger urban centres, as well as the overall sustainability of the planet.

What are some of the biggest challenges facing the industry today?

I believe that the rising costs of production, the increased pressures due to climate change, and changing consumer demands, are some of the biggest challenges today. Thirty or 40 years ago, most people had a connection somehow to a farm. Today, most people do not, and have never even been on a farm. This makes it much more challenging on our industry, as it means that our farmers are questioned and scrutinized on their practices. However, in difficulty lies opportunity, and we need to make sure that we make communication with the general public an important part of everything we do. As an industry, we must be "in tune" with the consumer and the concerns they have with where their food comes from and how it is raised. We need to make sure we are listening, educating, and engaging with our consumers every step of the way.

In your opinion, what role does animal agriculture have in feeding the world's growing population?

As the global population continues to increase exponentially, food security, climate change and environmental sustainability will be the greatest challenges for future generations and animal agriculture will be a critical part of the solution. Through research and advancement of technology, our industry has done very well at being innovative, proactive and providing vision and leadership to address the challenges of feeding a growing, increasingly urbanized population. Our future depends on this continuing. There are, and will be, many exciting opportunities in this industry for our young people.

Working in agriculture, what are you most proud of?

The dedicated, resilient people that I get to work with each and every day is what I am most proud of. I feel honored to work in this amazing industry. I am thankful that I was fortunate enough to be born and raised on a farm, and that I get to be a part of this important industry today.

The Agricultural Campus is a pretty special and unique place, as we hear over and over. What's your favourite characteristic of the Agricultural Campus?

The first thing that comes to mind is that AC has always been known for the strong, specialized programs they offer. In addition, I have wonderful memories of AC, and I still have strong connections to the campus and the people. I am so thankful for that. I think what makes it such a special and unique place for me is the tight-knit family that the AC is, regardless of the generation you come from. When you return to the campus today, you always feel welcome as an alumnus. I grew up hearing from my grandfather and father about all the dedicated, visionary people that were a part of AC through the years. I continue to see this today. It does not matter where you go — aggies are connected, whether you know each other or not. That is pretty special.

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