

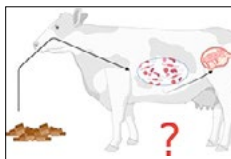
# For the Land and Its People

NDSU College of Agriculture, Food Systems, and Natural Resources > North Dakota Agricultural Experiment Station > NDSU Extension



## NDSU Extension Helps Foster Farm-to-School Partnerships

NDSU Livestock Microbiome Research Poised to Address Challenges Facing Ranchers



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### January–February 2024

The phrase “move the needle” means to proactively effect change that is measurable. To serve the citizens of the North Dakota, NDSU Agriculture strives to proactively respond to the questions and issues facing our state. This includes research that benefits our agricultural community, reaching more youth through 4-H and preparing NDSU students for fulfilling careers. We invite you to learn more about how the College of Agriculture, Food Systems, and Natural Resources; North Dakota Agricultural Experiment Station; and NDSU Extension are moving the needle in this issue of For the Land and Its People.

Enjoy.

**Greg Lardy**

Vice President for Agricultural Affairs

**NDSU** NORTH DAKOTA STATE UNIVERSITY

College of Agriculture, Food Systems, and Natural Resources  
North Dakota Agricultural Experiment Station  
NDSU Extension



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# NDSU Extension Helps Foster Farm-to-School Partnerships

In a collaborative effort, North Dakota State University Extension, in partnership with the North Dakota Department of Agriculture and the North Dakota Department of Public Instruction, hosted five Farm to School events across the state toward the end of 2023. The events aimed to share information on the North Dakota Farm to School Program and foster connections between farmers, ranchers and school districts.

Leveraging NDSU Extension’s network, the initiative allowed the Department of Agriculture and Department of Public Instruction to reach producers who might not be aware of the opportunities available for collaboration with schools. NDSU Extension professionals helped to find locations, facilitate the meetings, and provide technical support so the events could reach both in-person and virtual audiences.

Participants gained insight into the types of foods local schools are interested in procuring from farmers and ranchers, the process of selling to schools and ways to overcome potential barriers. Additionally, farmers and ranchers had the opportunity to register for inclusion on the Department of Agriculture’s local foods map.

A highlight of the program was a growers panel, providing a platform for farmers who are already selling to schools to share their experiences.

“I saw the most value in those discussions among growers,” says Andrea Bowman, NDSU Extension leadership and civic engagement program coordinator who facilitated two of the Farm to School events. “It was a great networking opportunity, allowing growers and schools to connect, learn the regulations and identify challenges so they can work through solutions.”

Post-event, farmers and ranchers were already making connections with school districts, laying the groundwork for partnerships in the coming year.

“Much like growers utilize farmers markets, these Farm to School partnerships serve as another way for farmers and ranchers to showcase their products, opening doors to a market they may not have explored previously,” says Bowman.

## FOR MORE INFORMATION:

North Dakota Farm to School Program:

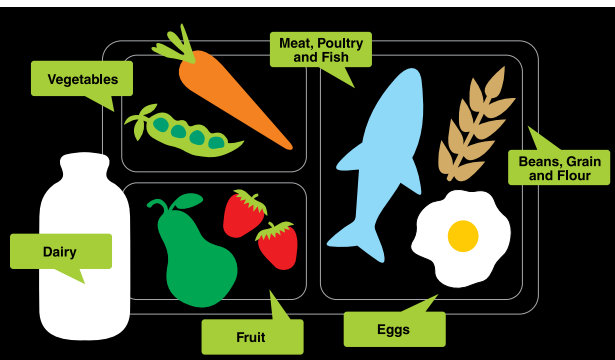
[www.ndda.nd.gov/divisions/business-marketing-information/local-foods/farm-school](http://www.ndda.nd.gov/divisions/business-marketing-information/local-foods/farm-school)

NDSU Extension Guide to Buying and Selling Local Food:

[www.ndsu.edu/agriculture/extension/publications/guide-buying-and-selling-local-food](http://www.ndsu.edu/agriculture/extension/publications/guide-buying-and-selling-local-food)

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What Types of Products?





# NDSU Livestock Microbiome Research Poised to Address Challenges Facing Ranchers

**R**anchers in North Dakota and across the U.S. are gearing up to face unprecedented challenges in the coming years, including resistance to antibiotics, growing interest in the environmental footprint of beef production and increased demand for beef to feed a growing global population. Samat Amat, assistant professor in the Department of Microbiological Sciences, and his research team are working to address these challenges through research on the livestock microbiome.

The communities of bacteria living within the respiratory, gastrointestinal and reproductive tracts of livestock are vital to animal health and reproduction. Changes to an animal's microbiome can improve efficiency of feed utilization, promote resilience against infectious diseases, and mitigate methane emissions.

"I believe that the maternal gut and reproductive microbiome, and the communication between the microbes in the mother's body and those in offspring hold a treasure trove for improved calf health and feed efficiency," Amat says. "My research program aims to unlock this treasure trove."

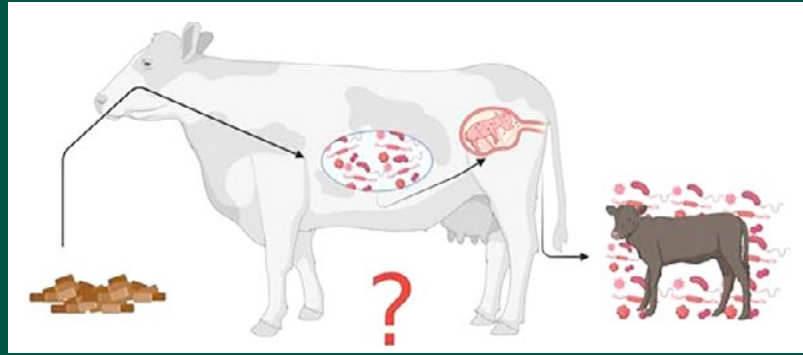
In collaboration with faculty members from the Department of Animal Sciences, Amat and his team are investigating how changes to the microbiome of the pregnant cow affect the calf's developmental programming. These changes can impact the calf's microbiome development, energy balance, methane emissions and feedlot performance.

Amat's lab also is working on a microbiota-based approach to mitigating pinkeye in cattle. Pinkeye is a major concern for ranchers due to antimicrobial resistance. In partnership with Extension veterinarian Dr. Gerald Stokka and the NDSU Veterinary Diagnostics Laboratory, Amat and his team collected samples from veterinary clinics across the state to identify bacterial communities in healthy eyes. They have made significant progress toward developing a synthetic bacterial community that can control pinkeye without reliance on antibiotics.

Through these and other research projects, Amat and his team are leveraging the livestock microbiome to contribute important solutions for the future of ranching and beef production in North Dakota and beyond.

## FOR MORE INFORMATION:

[www.ndsu.edu/agriculture/academics/academic-units/microbiological-sciences/research/amat-lab](http://www.ndsu.edu/agriculture/academics/academic-units/microbiological-sciences/research/amat-lab)  
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# NDSU Extension Pesticide Certification Program Remains Vital to Safe Handling and Knowledge

“There’s so much information to digest when it comes to pesticides,” says Dwight Johnson of Park River, North Dakota. “Whether it’s the chemistry of pesticides or understanding spray drift, NDSU Extension’s Pesticide Certification program provided the information I needed to work with pesticides effectively.”

Close to 4,000 individuals obtain their pesticide certification through NDSU Extension’s Pesticide Certification Program in any given year.

“Extension is responsible for the certification of pesticide applicators and/or dealers in North Dakota,” says Andrew Thostenson, Extension pesticide program specialist. “Certification is intended to ensure that people who use or merchandise certain pesticides or who make specific types of pesticide applications have a fundamental understanding of how to do so safely. Pesticide certification is the foundation for the safe and effective use of pesticides.”

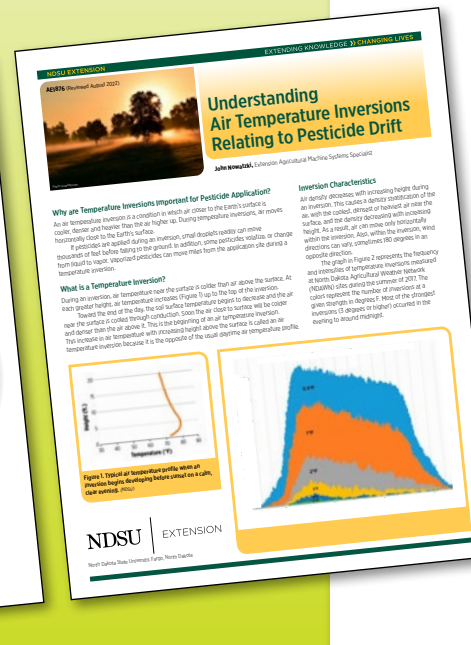
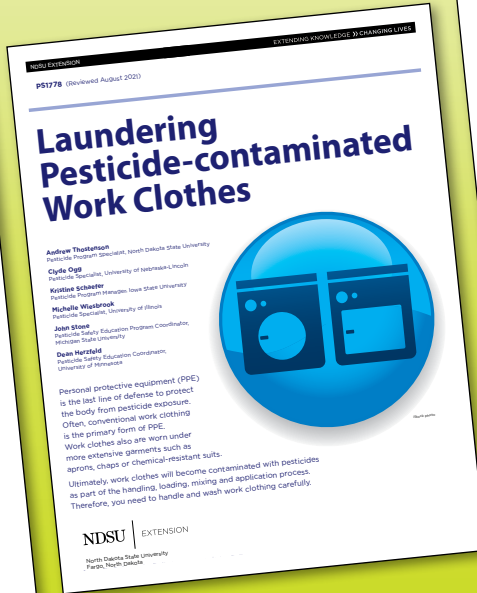
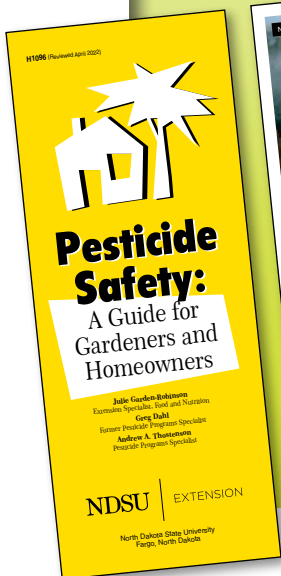
Pesticide certification is required by the U.S. Environmental Protection Agency for persons selling, purchasing or using restricted-use pesticides. The program is offered to private applicators like farmers, gardeners and landowners, or anyone wanting to spray restricted-use pesticides, and commercial or public applicators and dealers.

“For this program to be successful, it takes a collaborative effort among NDSU Extension county agents who administer the program in each county and state specialists who develop the technical information needed to keep the program timely and relevant,” shares Thostenson.

Rick Schmidt, NDSU Extension agent in Oliver County, believes that no other Extension program allows agents to develop relationships with every landowner, farmer, or farm worker in their respective counties the way the pesticide certification program does.

“We believe this program empowers all applicators to use pesticide products both effectively and economically,” Thostenson says. “But beyond providing knowledge on current pesticide issues, we are always thinking ahead to improve the training for future applicators. In the past few years, we’ve incorporated information on application efficacy, adapting to weather conditions, endangered species protection and advice on tank mixing pesticides.”

**FOR MORE INFORMATION:**  
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# Controlling Kochia:

## NCREC Research Takes Aim at Herbicide Resistant Weed

**K**ochia has been a very troublesome weed in the Northern Plains for decades. Farmers' ability to control kochia has become even more difficult since kochia has developed resistance to some of our commonly-used herbicides, says Brian Jenks, North Central Research Extension Center weed scientist.

In recent years, agronomists at the NCREC near Minot have observed that some kochia populations are no longer completely controlled by glyphosate, Starane and dicamba.

"Glyphosate has been used in no-till production to control weeds just prior to or after crop planting," says Jenks. "In 2012, kochia was found to be glyphosate-resistant in some North Dakota populations. Since then, growers have relied heavily on Group 14 PPO herbicides like Sharpen and Aim to assist in controlling kochia in a burndown situation."

However, in December 2022, NDSU research showed that some kochia populations are resistant to glyphosate and the Group 14 herbicides, Sharpen, Aim, Vida and Reviton. Kochia resistance to Glyphosate and Group 14 herbicides will leave no-till farmers with few preplant foliar burndown options.

Additionally, NDSU research demonstrated that these kochia populations are less sensitive to other extremely important soil-applied Group 14 PPO herbicides like Spartan and Valor. Many growers rely on Spartan and Valor to provide residual kochia control through root uptake.

Not all kochia is resistant to these Group 14 herbicides, but farmers should actively monitor fields following herbicide applications, advises Jenks.

Kochia will need to be managed through cultural practices in addition to using other herbicide modes of action. Rotation to crops such as wheat and corn will allow other effective herbicide modes of action to be used. Gramoxone remains an effective option for burndown kochia control in front of any crop.

Using dicamba in dicamba-tolerant soybeans as a pre-emergence treatment has provided effective kochia control. Metribuzin provides another mode of action and has been effective when used pre-emergence in soybean, dry pea and lentil.

The National Agricultural Genotyping Center is developing a genetic test that will determine if a kochia plant is resistant to Group 14 PPO herbicides. Farmers will be able to send two to three kochia leaves for testing and will receive results within a couple weeks. This genetic test will be a significant help to growers so they can quickly adjust their management strategies, if necessary.

### **FOR MORE INFORMATION:**

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# North Dakota 4-H Expands Its Reach Across the State

As the only research-based youth organization in the state, North Dakota 4-H plays a pivotal role in equipping youth with essential life skills and preparing them to enter the workforce as the next generation of leaders for our state. Through 4-H's immersive, hands-on learning experiences, youth develop confidence, creativity, curiosity, leadership skills and resiliency to thrive now and in the future.

In 2023, North Dakota 4-H experienced a remarkable growth in its reach, thanks to the efforts of NDSU Extension staff and volunteers across the state. The number of young people engaged increased by 40.3%, growing from 29,377 in 2022 to 41,217 in 2023. As a result, one in every five North Dakota youths benefited from 4-H programs in 2023.

With a 9.7% increase in enrolled members for a total of 6,909 members, North Dakota 4-H is expanding opportunities to strengthen youth will life skills. Participation in North Dakota 4-H camp also increased by 5% with youth participation from 47 of the state's 53 counties.

"The expansion of 4-H in North Dakota is undeniably a cause for celebration," says Leigh Ann Skurupey, NDSU Extension's assistant director for 4-H Youth Development. "With each new connection forged, every skill acquired and every volunteer hour dedicated, 4-H is growing a vibrant community of tomorrow's leaders."

As 4-H youth develop vital life skills and readiness for the workforce, 4-H volunteers also are enriched through professional growth and networking opportunities. A recent study conducted by a multistate collaboration of 4-H professionals found that a significant majority of 4-H volunteers in North Dakota reported positive outcomes: 82% noted an increase in their leadership confidence, 89% established new connections within their community, and 87% gained personal benefits, such as acquiring new skills that are applicable in others settings.

Communities also benefit from the influence of 4-H. In 2023, more than 500 North Dakota 4-H clubs engaged in 2,165 service-learning projects, actively bolstering their communities and fostering positive transformations.

## FOR MORE INFORMATION:

[www.ag.ndsu.edu/4H](http://www.ag.ndsu.edu/4H)

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### NDSU's Land-Grant Mission

The College of Agriculture, Food Systems, and Natural Resources has a tradition of excellence in educating students for real-world careers. Our students learn from and work with world-class scientists in state-of-the-art facilities. These interactions, along with a relatively low student-faculty ratio, provide opportunities for students to develop their critical thinking skills, to work in a team setting, and to capitalize on hands-on learning experiences that will allow them to be competitive in a global economy.

The North Dakota Agricultural Experiment Station consists of seven Research Extension Centers placed strategically throughout the state, the Agronomy Seed Farm in Casselton and the Main Station in Fargo. We work to develop techniques and technologies to enhance the production and use of food, feed, fiber and fuel from crop and livestock enterprises.

NDSU Extension empowers North Dakotans to improve their lives and communities through science-based education. We serve all people of the state through our 52 county and Fort Berthold offices, seven Research Extension Centers and the main campus in Fargo.

For more information on the programs in this publication, contact the faculty and staff listed. For more information about our other programs or have questions, comments or suggestions, please contact me.

#### Greg Lardy

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### NDSU FCS Education Degree Empowers Students to Succeed

Family and Consumer Sciences (FCS) education empowers individuals and families across the life span to manage the challenges of living and working in a diverse, global society. With its unique focus on families, work and their interrelationships, teachers of FCS focus on the science of human development, wellness and decision-making.

The Family and Consumer Sciences Education major at NDSU is now part of the Youth Development, Family, and Agricultural Education department in the College of Agriculture, Food Systems, and Natural Resources.

Graduates of the FCS education major generally go on to teach in middle and high schools, occupational or non-occupational programs, and adult programs. Students can choose between a teacher licensure pathway and a training and development pathway, depending on whether they wish to teach in the classroom or in another environment.

Those who elect to take the teacher licensure pathway will be qualified to teach courses in subjects such as child development, nutrition, personal finance, interior design, textiles, relationships, food preparation, education, and consumer economics.

"FCS classes prepare middle school and high school students for careers, for home life, and for balancing the delicate relationship between the two. Along with FCS content, students learn teamwork, responsibility, planning, and communication skills" says Mari Borr, NDSU professor of Family and Consumer Sciences Education.

"Examples of career options include becoming a high-school Family and Consumer Sciences teacher, child-life specialist, parent educator, nutrition consultant, family-life educator, or Extension family and community wellness agent," shares Mari Borr, NDSU professor of Family and Consumer Sciences Education. "Our graduates also work in youth programs and non-profit programs."

Katelyn Gorder, a Family and Consumer Sciences teacher at Grafton High School and a 2015 NDSU graduate, recently received a national Milken Educator Award for 2023-24. The Award comes with a \$25,000 cash prize that Gorder can use for any purpose.

Gorder, who earned her bachelor's degree in Family and Consumer Sciences education, credits NDSU as helping lead her down the path to a successful career.

In addition to the FCS undergraduate degree programs, NDSU also offers two FCS master's degree program that are completely online. Option A is for those who have a bachelor's degree in an FCS-related area and are working toward FCS teacher licensure. Option B is designed for current educators or other FCS professionals seeking personal and professional advancement.

**FOR MORE INFORMATION:** NDSU FCS Education Degree Program - [ndsu.edu/FCS](http://ndsu.edu/FCS)  
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