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Strategic Discussions for Nebraska

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Thriving Nebraska: Key Drivers for Community Economic Vitality

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— 2020 —

STRATEGIC DISCUSSIONS
FOR NEBRASKA

THRIVING NEBRASKA

*Key Drivers for
Community Economic Vitality*



“ When we think about community vitality, we consider the factors that influence the quality of life and the prosperity of life for people in those communities. We have a responsibility in our research and discovery agenda to push the bounds and discover new information. Then, we put this new information to work in our state. ”

— *Michael J. Boehm* —

University of Nebraska Vice President for Agriculture and Natural Resources
University of Nebraska-Lincoln Harlan Vice Chancellor,
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COVID-19: A GLOBAL PANDEMIC

In 2020, a global pandemic shook the world, causing significant changes to all industries. Higher education was not immune to these impacts. In March 2020, the University of Nebraska–Lincoln moved to remote learning for the remaining weeks of the spring, which drastically changed the typical course design.

Strategic Discussions for Nebraska (SDN) is created each spring by senior students from the Agricultural and Environmental Sciences Communication program and as a result of COVID-19, the course this year was moved to a remote setting.

Typically, a formal, in-person interview and photo shoot is arranged with each person highlighted in SDN. However, in 2020, interviews were conducted via Zoom, some photos were collected from archives, and story writing and editing were completed via distance. Despite this, students remained resilient and met the challenge to ensure SDN told the story of the Institute of Agriculture and Natural Resources in 2020.

It is important to note that the stories in this 2020 SDN were written at the beginning of the pandemic in the United States and were left in the original form.

SDN sends our heartfelt thoughts to everyone across the globe impacted by COVID-19.

ABOUT STRATEGIC DISCUSSIONS FOR NEBRASKA

Strategic Discussions for Nebraska (SDN) is an annual publication covering research conducted at the University of Nebraska–Lincoln Institute of Agriculture and Natural Resources (IANR). The Nebraska Legislature created IANR in 1973 through the enactment of LB149. The institute implements this within its six communities:

1. Computational Sciences
2. Science Literacy
3. Healthy Systems for Agricultural Production and Natural Resources
4. Drivers of Economic Vitality for Nebraska
5. Healthy Humans
6. Stress Biology

SDN shares the IANR story by translating research-based science to be understood by the general public. SDN has been produced annually since 2008, each focusing on a different overall topic.

In recent years, SDN has rotated through IANR communities as a publication theme.

This 2020 edition focuses on *Drivers of Economic Vitality for Nebraska*. Stories in this edition are focused on IANR work done in both rural and urban communities across Nebraska to build and support vital communities. Specifically, stories cover directed community initiatives, such as Rural Prosperity Nebraska through Nebraska Extension and tele-mental health services provided by the College of Education and Human Sciences, faculty-led initiatives to encourage entrepreneurship as an option for people to return to rural Nebraska, innovative farm production ideas that are specific to the Nebraska climate, preparing future generations for continued community vitality through inquiry-based learning and Nebraska 4-H programming, diversifying manufacturing and food processing options for those interested in developing new businesses, and transforming raw materials into value-added products, such as using soybeans and sorghum in innovative ways.

Students in the Agricultural and Environmental Sciences Communication program in the Department of Agricultural Leadership, Education and Communication write the stories for the SDN publication. New in 2020, senior students also provided photography for the publication and created promotional videos for the website and social media.

University Communication provided graphic design and IANR Media offered website design expertise. IANR provided funding, business and liaison services for the production of this publication.

A sincere appreciation is expressed for the original vision and financial support of the Robert and Ardis James Family Foundation, which founded SDN in 2007.

Please visit our website, sdn.unl.edu to find the complete publication and photo and video promotion.



Thank you for your interest in Strategic Discussions for Nebraska!

Dr. Laura E. Young

SDN Director and Editor

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INSTITUTE OF AGRICULTURE AND NATURAL RESOURCES

University of Nebraska-Lincoln Institute of Agriculture and Natural Resources (IANR) focuses on people and the food, energy, water, natural resources and communities that sustain them.

IANR scientific innovation in the land-grant mission areas of teaching, research and Extension places Nebraska on the leading edge of food production, environmental stewardship, human nutrition, business development and youth engagement.

IANR comprises the College of Agricultural Sciences and Natural Resources (CASNR), the Agricultural Research Division (ARD), Nebraska Extension, and the ARD and Extension components of three departments in the College of Education and Human Services.

IANR is committed to growing the future of Nebraska's people, businesses and communities.

Strategic Discussions for Nebraska highlights teaching, research, and Extension projects occurring within IANR with the goal of communicating the work to a general audience.

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STRATEGIC DISCUSSIONS FOR NEBRASKA STUDENT WRITERS

Students in the Agricultural and Environmental Sciences Communication program in the Department of Agricultural Leadership, Education and Communication create the content for the Strategic Discussions for Nebraska publication during their final semester in the program.

The senior capstone course provides a learning experience similar to those students may encounter in the workplace, emphasizing accurate, clear and objective communication of science-based information.

During the course, students learn about scientific research being conducted at the university and the diverse funding sources required to support that research.

Throughout one semester, the students interview scientists from many disciplines and write stories, take photos, create videos, and design social media content based on those interviews. The stories in this publication were reviewed by the sources and approved for publication.



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BRIEF HISTORY OF THE LAND-GRANT MODEL OF PUBLIC EDUCATION

By Mary Garbacz

The University of Nebraska is one of more than 100 land-grant institutions in the United States and its territories. Although the University of Nebraska-Lincoln was the original campus of the University of Nebraska, the land-grant mission extends to all four campuses of the University of Nebraska system. The land-grant college system was established by the passage of the Morrill Act in 1862.

The Morrill Act of 1862

On July 2, 1862, President Abraham Lincoln signed into law a bill that donated land to each state for the establishment of colleges to provide a liberal and practical education to the “industrial class,” or the common person. These colleges would provide instruction in agriculture, military tactics, the mechanic arts and classical studies. Because of the land granted to each state and territory, the Morrill Act of 1862 became known as the land-grant act.

Sponsored by U.S. Congressman Justin Smith Morrill of Vermont, the bill allotted 30,000 acres of public land for each sitting senator and representative in Congress to establish these colleges. Morrill could not have known the future impact this law would have in providing equal opportunity to education to people in the United States and its territories.

Today, there are more than 100 land-grant institutions in the United States and its territories, each focusing on teaching, research and outreach — taking new knowledge to the people.

The University of Nebraska was founded on February 15, 1869, and designated a land-grant institution under the 1862 Morrill Act. The land-grant system formed the framework for the land-grant institutions’ missions of teaching, research and Extension.

Hatch Act of 1887

Twenty-five years after the Morrill Act was passed, the Hatch Act of 1887 provided funding for agricultural research programs at state land-grant agricultural experiment stations in the 50 states of the United States, the District of Columbia and the U.S. territories. The Hatch Act established agricultural experiment stations in connection with the land-grant colleges so research could be conducted and applied in practice.

Named for Congressman William Henry Hatch, the Hatch Act established not only experiment stations, but also distribution of information to the people of the United States on subjects connected with agriculture. The Hatch Act also provided an annual payment to each state and territory for the expenses of research, as well as for printing and distributing the results.

Hatch research activities involve a range of options related to agriculture, land use, natural resources, family, human nutrition, community development, forestry and more and can be local, state, regional or national in scope. A further requirement of the Hatch Act of 1887 is that new information is to be extended to the public.

The Morrill Act of 1890

The Morrill Act of 1890 also established funding for land-grant institutions specifically for African-Americans. These institutions are sometimes called “1890 schools.” These 16 public institutions, plus one private institution, are among the more than 100 historically black colleges and universities in the United States. The Morrill Act of 1890 also forbade racial discrimination in admissions policies for institutions receiving these federal funds.

Smith-Lever Act of 1914

The Smith-Lever Act of 1914 created a Cooperative Extension Service within each land-grant institution. Cooperative Extension, a partnership between the U.S. Department of Agriculture and agricultural colleges, helps to extend information produced by the research of scientists within each college’s experiment station.

Equity in Educational Land-Grant Status Act of 1994

The Equity in Educational Land-Grant Status Act of 1994 provided land-grant status for certain American Indian colleges and institutions, bringing higher education to reservation communities. The act directed the U.S. Secretary of the Treasury to establish a 1994 Institutions Endowment Fund and the U.S. Secretary of Agriculture to make capacity-building grants to these institutions.

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“ COVID-19 has not changed the goals of IANR. Our commitment to growing food, fuel, feed, and fiber for a growing population still stands true. I think we actually have an opportunity to showcase the high quality of life for families in Nebraska. ”

— *Michael J. Boehm* —



Michael J. Boehm

KEY DRIVERS FOR COMMUNITY ECONOMIC VITALITY IN NEBRASKA: Institute of Agriculture and Natural Resources Focus on Nebraska Economy

*Interview with Michael J. Boehm
by Matthew Morton*

Every year, the Strategic Discussions for Nebraska publication highlights research and projects of faculty and staff in the Institute of Agriculture and Natural Resources (IANR). This year's edition is focused on drivers of economic vitality across the state of Nebraska.

"When we think about community vitality, we consider the factors that influence the quality of life and the prosperity of life for people in those communities," said Michael J. Boehm, University of Nebraska Vice President for Agriculture and Natural Resources and Harlan Vice Chancellor of IANR at the University of Nebraska-Lincoln.

Community vitality initiatives help enhance tourism, assist with sustainable natural resources, and create jobs across the state.

IANR has expanded research and projects across rural Nebraska communities and finds new ways to share this work with people most impacted.

STATE-WIDE RESEARCH, LOCAL IMPACT

The work done in IANR is aimed to enhance the lives of those living within Nebraska.

"We have a responsibility in our research and discovery agenda to push the bounds and discover new information," Boehm said. "Then, we put this new information to work in our state."

IANR is committed to finding innovative ways to enhance the economic growth of the state. Current work being done at the university will have a critical impact on the future of agriculture and natural resources.

For instance, Chris Chizinski, associate professor in the School of Natural Resources, combines social sciences with hunting and fishing with the goal of increasing agro-tourism in rural areas of Nebraska. Small towns in Nebraska depend on the ecotourism dollars brought in by hunters and fishermen so involvement makes an impact on Nebraska's economy and ecosystems.

Additionally, Paul Springer, professor in the Department of Child, Youth and Family Studies develops innovative ways to improve mental health in underserved and hard-to-reach populations by using technology. Springer said 88 of Nebraska's 93 counties are deemed as shortage areas for mental health care providers and tele-mental health services allow rural Nebraskans to seek confidential mental health care.

Further, Nebraska Extension also plays an important role in the land-grant system of the university. Most Nebraska counties have an extension office where information from the university is shared. For example, the Rural Community Prosperity Initiative helps rural Nebraska communities grow economic and business opportunities, create vibrant communities, and engage their residents through various programming. Further, Nebraska Extension also engages Nebraska youth. Particularly, Nebraska 4-H provides a wide variety of opportunities to Nebraska youth such as the statewide robotics competition, gardening, baking, and showing livestock. Nebraska 4-H allows youth to engage in a variety of skills such as problem-solving, creative thinking, and entrepreneurship which help them return to Nebraska's workforce in the future.

The impact of IANR research and projects reaches to most counties in Nebraska.

IANR STAYS STRONG THROUGH A GLOBAL PANDEMIC

Even though the world has seen drastic change through the impacts of COVID-19, Nebraska's agricultural producers and keepers of natural resources have remained resilient.

"COVID-19 has not changed the goals of IANR," Boehm said. "Our commitment to growing food, fuel, feed, and fiber for a growing population still stands true."

IANR initiatives simply took on a new approach. Extension educators worked remotely and conducted online meetings with growers to help fulfill their needs. Researchers on campus still have access to their labs to help find solutions to current problems. University officials work to stay ahead of the curve to assist faculty, staff, and students in all the ways they can.

Even with all of the uncertainty there is still, and always will be, hope to grow Nebraska.

"I think we actually have an opportunity to showcase the high quality of life for families in Nebraska," Boehm said. "This could be a great opportunity to stimulate engagement for our state."

Boehm said COVID-19 may have even resulted in a surge of people who want to reconnect with their rural roots, where they are able to isolate more. Research within IANR highlights areas of growth in rural Nebraska.

This focus will help grow Nebraska and assist the residents living there.

"We need to keep focusing on the people who produce our food and the resiliency and the vibrancy of our rural communities," Boehm said.

IANR COMMUNITIES

In 2011, six communities were created to help focus faculty and staff research and/or projects into different sectors. Boehm said each one serves great importance to IANR's goal of producing food, fuel, feed, and fiber to supplement the growing populations. The IANR six communities are:

- Computational Sciences
- Drivers of Economic Vitality
- Healthy Humans
- Healthy Systems for Agricultural Production and Natural Resources
- Science Literacy
- Stress Biology

By focusing on these six communities, IANR is able to conduct research, educate students, and conduct outreach activities in areas that affect Nebraskans most. The goal of IANR is to pair faculty and Extension educators with communities to determine needs.

"We put professionals from the university in partnership with the community to help them clarify their vision of what they need," Boehm said.

Of the 93 counties within Nebraska, each one has an Extension educator assigned to it. The Extension offices are the liaison between rural Nebraska and research centers across the state. The work being done by these Extension educators help focus research toward specific goals set by individual counties.

For more information on IANR, please visit ianr.unl.edu.

“ We need to keep focusing on the people who produce our food and the resiliency and the vibrancy of our rural communities. ”

— *Michael J. Boehm* —



KEY TAKEAWAYS

- 1** IANR keeps a constant focus on ways to develop rural economic vitality.
- 2** By focusing on new research and technology, IANR is helping family farms stay in production for the next generations.
- 3** IANR places Extension agents within the communities of Nebraska to learn more and tailor the research to specific regions.
- 4** COVID-19 has not changed the goals of IANR, but instead has provided unique opportunities for growth.



For more information on IANR, please visit ianr.unl.edu.



“ Rural Prosperity Nebraska is a directed community vitality initiative focused on building the entrepreneurial, economic, and social capacities of small towns throughout the state. ”

— Marilyn Schlake —

Directed Community Vitality Initiatives



Marilyn Schlake

RURAL PROSPERITY NEBRASKA IN ACTION: Bringing Nebraska Communities Together for Economic Success

Interview with Marilyn Schlake
by Katie Bresnahan

Small, rural communities in Nebraska are home to an abundance of unique businesses, cultures, and people. These communities face everyday challenges to remain economically viable and to thrive during changing times. To combat unique challenges, recent collaborative programs between the university and communities are seeing positive outcomes.

Marilyn Schlake, Nebraska Extension educator at the University of Nebraska-Lincoln, works to build the capacity of rural communities in Nebraska as part of the Rural Prosperity Nebraska.

“Rural Prosperity Nebraska focuses its effort on building the entrepreneurial, economic, and social capacities of small towns throughout the state,” Schlake said. “Building strong communities through Nebraska Extension programming and research helps Nebraskans build and retain a strong, stable economy.”

COMMUNITY PROSPERITY AND ENGAGEMENT

Rural Prosperity Nebraska works directly with Nebraska communities to customize engagement for each community to retain current residents and recruit new ones.

Specifically, this group helps battle one of the largest issues facing rural Nebraska — declining populations. Depopulation is defined as a documented change in rural communities for roughly three decades that is causing issues in the economic tax base, schools, healthcare, and overall quality of life for residents.

Schlake said rural towns can fight this issue by building vibrant communities with strong leadership.

“In order to have a strong Nebraska, we need strong communities,” Schlake said. “In order to have strong communities, we need strong businesses and people that are willing to step up and provide leadership in their communities.”

Rural Prosperity Nebraska works with communities to generate data from their residents, identify issues, and create action plans.

Specifically, Schlake works on three projects addressing concerns within rural communities:

1. Entrepreneurial Community Activation Process
2. Marketing Hometown America
3. Stronger Economies Together

Entrepreneurial Community Activation Process (ECAP)

ECAP encourages and supports entrepreneurship and business innovation in small communities by targeting economic improvement.

Schlake said ECAP offers communities the option to survey their residents to collect data on leadership, infrastructure, entrepreneurial support, culture, sense of place, and the workforce, to identify areas needing improvement.

“By understanding their opportunities, unique characteristics and assets, communities are able to set goals and create change,” Schlake said.

Communities have implemented improvements including business loan programs, new community facilities and greater communications through social media and community information websites.

Positive outcomes from this program include increased engagement, communication, and opportunities for enacting change in the community, according to Schlake. Additionally, the program helps communities form unified goals and create action plans.

“Overall, the program is one way for a community to share the resources that it already has in order to grow and benefit the public as a whole,” Schlake said.

Marketing Hometown America (MHA)

This program focuses on the recruitment and retention of new residents to small, rural Nebraska towns.

“Based on prior work, the MHA team uses research on what attracts people to move to a community, why people pick a specific community, and how it feels to be a part of that community,” Schlake said.

Using this information, community members evaluate resources, strengths, and weaknesses and create action plans.

Most importantly, Schlake said MHA allows communities to learn what new residents look for when they relocate to a rural community — and meet those expectations. Communities also discover previously overlooked local assets that attract new residents creating a welcoming community spirit.

This program works with community members in small group *study circles* to discuss what makes their community special, how they receive new residents, and how the current residents feel about living there.

The positive *study circles* conversations typically lead to the development and implementation of a community marketing action plan.

Stronger Economies Together

This collaborative project between several universities, USDA Rural Development, and National Extension focused on bringing communities together to realize their potential.

Five counties in Southeast Nebraska came together in order to create a regional development plan in 2015 to utilize their potential as a region, according to Schlake. Today, community-led teams are implementing the vision created through this program.

The community groups who generated ideas for this project, *Partners for Progress*, included over 110 individuals from Johnson, Nemaha, Otoe, Pawnee, and Richardson counties in education, business, nonprofits, economics, government, and media, Schlake said. *Partners for Progress* formed a plan to activate the region’s ability to serve as a hub for industry, tourism, and entrepreneurship.

By doing so, the *Partners for Progress* found common ground between communities and set goals in art and entertainment, manufacturing, workforce and entrepreneurship in southeast Nebraska. Key projects included promotion of manufacturing to the next generation and saving a vital business and hundreds of jobs when they helped to secure a new buyer for a closing manufacturer in Auburn.

The *Partners for Progress* further focused on an entrepreneurial goal, as 93% of the businesses in the region have 10 or fewer employees. By encouraging

and supporting entrepreneurship, the *Partners for Progress* knew they could create a stronger and more diverse economic base for the region.

“Focusing on building and maintaining a workforce is necessary to prevent depopulation and the Stronger Economies Together project brought jobs to the area,” Schlake said.



KEY TAKEAWAYS

- 1** Rural Prosperity Nebraska helps rural Nebraska communities to grow economic and business opportunities, create vibrant communities, and engage their residents.
- 2** The Entrepreneurial Community Activation Process encourages and supports entrepreneurship and business innovation in small communities, with the goal of improving the economy.
- 3** Marketing Hometown America focuses on the recruitment and retention of new residents to small, rural Nebraska towns by building community marketing plans.
- 4** Stronger Economies Together is a program that brings regional communities together in order to utilize resources and realize their potential.
- 5** Rural Prosperity Nebraska will continue to help rural communities develop their economic, social and business opportunities.



For more information on Rural Prosperity Nebraska community initiatives, visit ruralprosperityne.unl.edu.

“ In order to have a strong Nebraska, we need strong communities. In order to have strong communities, we need strong businesses and people that are willing to step up and provide leadership in their communities. ”

— Marilyn Schlake —



Paul Springer

TELE-MENTAL HEALTH SERVICES REVITALIZE RURAL NEBRASKANS:

Creating Accessible and Acceptable Rural Mental Health Care

*Interview with Paul Springer
by Alex Voichoskie*

Tele-mental health services boost work productivity in rural Nebraska by enabling people to access confidential and effective mental health care services. As community members tend to their mental well-being, businesses in rural Nebraska can employ productive people and receive positive economic benefits in return.

Paul Springer, professor in the Department of Child, Youth and Family Studies and associate dean for student success at the University of Nebraska-Lincoln, works to bring mental health services to rural Nebraska. Specifically, Springer evaluates ways to make mental health services more accessible and more acceptable, which creates more effective people who can contribute to community vitality.

“When we talk about community vitality, it is really about how mental health services will increase productivity of people,” Springer said.

In other words, Springer said people with a healthy mental well-being will be more productive at work, helping local businesses contribute to a stronger economy.

To encourage mental well-being, Springer and his colleague Dr. Bischoff introduced tele-mental health services to rural communities throughout Nebraska. The virtual services, conducted via video calls, allow rural residents mental health care in a way that is private, effective, and acceptable.

MENTAL HEALTH IMPACTS PRODUCTIVITY

Mental well-being significantly impacts employee productivity.

Springer said employees are 1.4 times less effective at work when they struggle with mental health issues. Therefore, for communities to be more economically viable, he said people should be taking time off work when experiencing mental and physical illness symptoms.

“It is costing employers money because employees cannot be present in work while they are mentally struggling,” Springer said.

Even when employees have access to mental health care services, the stigma surrounding these services prevent them from receiving care, Springer said.

“Stigma plays an important factor in whether or not people will utilize mental health services,” Springer said.

If employees view receiving mental health services negatively, employers suffer the economic consequences of having unproductive workers.

THERE IS NO HEALTH WITHOUT MENTAL HEALTH

Mental health is an integral part of a person’s physical and psychological health. Springer shared that the World Health Organization said there is no health without mental health.

Springer’s research was initially designed to develop ways for rural residents to access mental health services. However, his research found the negative stigma surrounding mental health services prevents many people from receiving mental health care. The discovery propelled him to pivot from improving mental health care accessibility to strengthening acceptability.

According to Springer, 88 of Nebraska’s 93 counties are deemed as shortage areas for mental health providers. Consequently, a majority of the public travels at least one hour outside their county to receive mental health services.

“Driving that far makes receiving mental health care seem like a bigger deal, because it seems like you are going to a specialist as opposed to just taking care of your well-being,” Springer said.

People put their overall health at risk when they willingly neglect their mental well-being. Tele-mental health options make it easier to receive care.

TELE-MENTAL HEALTH SERVICES

To combat the negative mental health stigma and boost productivity, Springer incorporated a tele-mental health services model in three Nebraska communities: Albion, Red Cloud, and Superior.

In this model, the university partners with rural hospitals and clinics to offer a more accessible and acceptable way of receiving mental health care services.

“If mental health services are not provided in a way that rural residents view as acceptable, they are not going to take advantage of it,” Springer said.

According to Springer, 80% to 85% of all local physician visits are usually mental health related. For instance, people may experience stomach aches or have trouble sleeping and perceive those as physical illnesses, when many times those are symptoms of anxiety and depression.

In Springer’s tele-mental health model, people first visit their local, trusted physician for care. When a physician identifies that a patient’s symptoms are related to mental health, the physician refers the patient to a mental health provider via technology. Mental health providers — master’s students studying marriage and family therapy under the Department of Child, Youth and Family Services — are not located in the same communities, so patients receive care via telecommunications, such as videoconferencing.

“Rural residents love the fact that students do not live in the community because they feel like they have some anonymity,” Springer said.

By implementing a mental health service utilized virtually and distantly, Springer said his team has seen substantial improvements in patient health. These mental health improvements ultimately lead to happier, more productive people.

WORKING WITH RURAL RESIDENTS

In addition to unequal access to mental health services, the culture of rural communities poses other challenges. For example, Springer said people tend to talk more about mental health in urban areas because there are more providers and services. In rural counterparts, however, there is not always equal access to mental health services.

“There is not a ‘one-size-fits-all’ approach for mental health care,” Springer said. “One rural community’s culture is so different from another.”

The differences in each community may prohibit mental health care providers from effectively applying the same methods to each patient. If providers do not consider the differences in each community, their counseling may not be as effective.

“We take our land-grant mission seriously as professors,” Springer said. “We love our Nebraskans and know that there are people in rural communities

who are silently suffering. This is one way for us to be able to contribute and address this problem.”

To learn more about tele-mental health services, or to meet with a mental health service provider, visit cehs.unl.edu/cfc/couple-family-clinic/.

“ If mental health services are not provided in a way that rural residents view as acceptable, they are not going to take advantage of it. ”

— Paul Springer —



Telehealth services in rural communities contribute to the improved health and vitality of Nebraskans, including Kert and Jenny Hensen of Wilcox, Nebraska.



KEY TAKEAWAYS

- 1 Employees are 1.4 times less effective at work when they are struggling with mental health issues.
- 2 About 80% to 85% of all physician visits are actually mental health related.
- 3 Accepting mental health care is just as important as accessing it. A negative stigma surrounding mental health plays a substantial role in whether or not people will utilize mental health services.
- 4 Eighty-eight of Nebraska's 93 counties are deemed as shortage areas for mental health care providers.
- 5 Tele-mental health services allow rural Nebraskans to seek confidential mental health care.



To learn more about tele-mental health services, or to meet with a mental health service provider, visit cehs.unl.edu/cfc/couple-family-clinic/.



Megan Kelley

HEALTH LITERACY IS A VITAL COMMUNITY NEED: Creating Opportunities for Health through Community Action

*Interview with Megan Kelley
by Emily Frenzen*

Health literacy is the foundation for living a healthy life. Communities are less capable of functioning economically when in an unhealthy state.

“Health literacy is the knowledge, motivation, and skills needed to make decisions about healthcare, disease prevention, and health promotion,” said Megan Kelley, assistant professor in the Department of Nutrition and Health Sciences at the University of Nebraska–Lincoln.

Kelley’s focus on health education and health literacy explores how access to information impacts individual decision-making and how community-based health affects quality of life.

Access influences an individual’s decision-making, which ultimately affects community well-being. Kelley said community members are more likely to have better health outcomes when local leaders create community-based strategies to promote health.

HEALTH LITERACY IN NEBRASKA

An individual’s health literacy depends on the ability to find, understand, and apply information, which determines well-being for the individual and the community, according to Kelley.

“When people are self-directed, equipped members of society, they can find information they need to be healthy,” Kelley said.

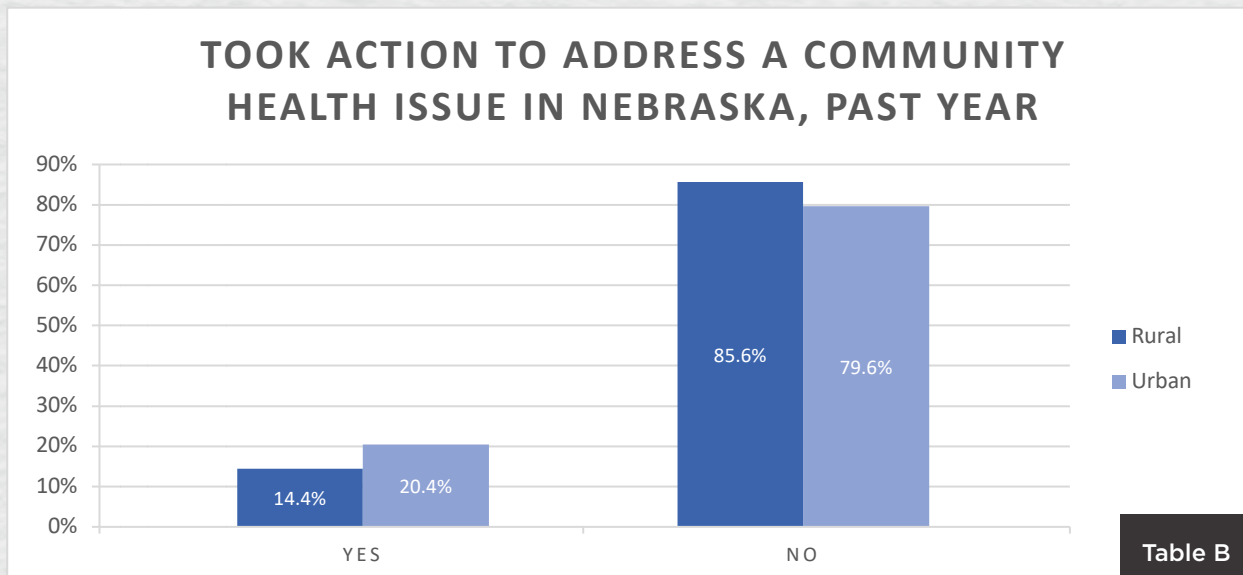
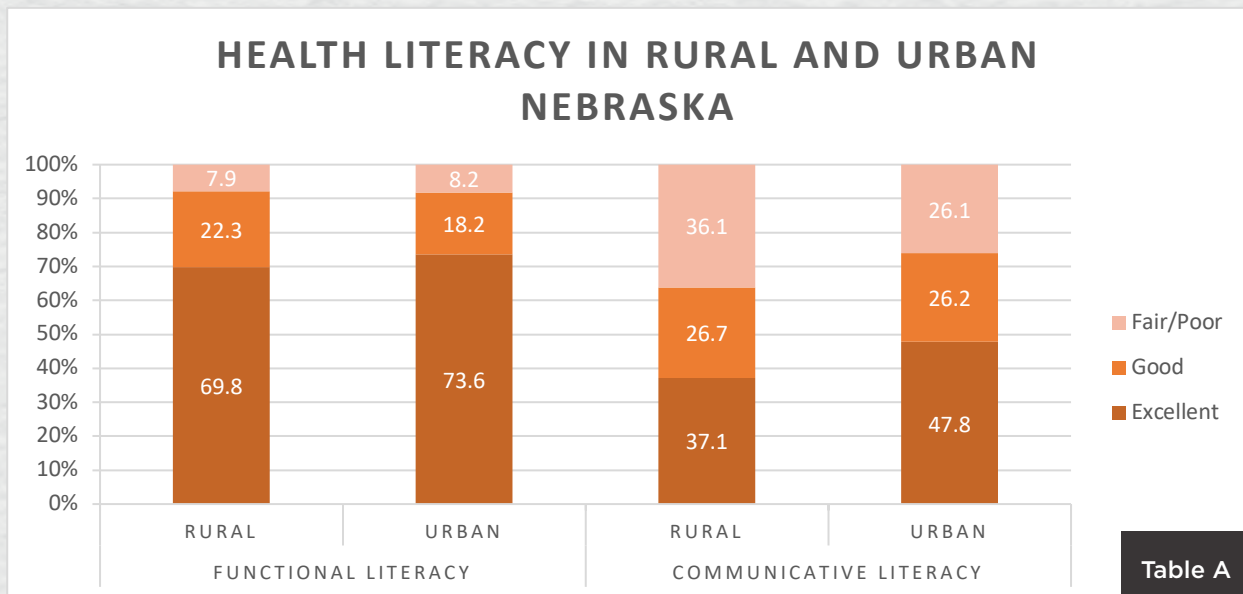
During summer 2019, Kelley included questions in the *Nebraska Annual Social Indicators Survey* to determine what factors were influencing health literacy in Nebraska. The questions included different forms of health literacy, such as functional literacy (for example, the ability to read and understand medical forms) and communicative literacy (for example, the likelihood of asking questions of health providers if more information is needed).

According to the findings (Table A), in rural Nebraska, 69.8% of respondents reported excellent functional literacy compared to 73.6% of respondents in urban Nebraska, meaning that many Nebraskans feel confident in the ability to read and understand medical forms.

Communicative literacy was reported to be lower in rural Nebraska with 37.1% reporting excellent communicative literacy, compared to 47.8% in urban Nebraska. These findings indicate that many Nebraskans may not be comfortable with or may face barriers to asking questions of their healthcare provider.

Health literacy empowerment also measured whether people took action to address a health issue in their community within the last year (Table B). In rural Nebraska, 14.4% reported that they took action to address a community health issue, while 20.4% took action in urban Nebraska.

“These findings suggest that rural Nebraskans may tend to defer to the authority of their care providers or that they may be more satisfied with their quality of life, but there is more to learn based on initial results,” Kelley said.



Improved health literacy in Nebraska means an improved understanding of, and ability to act on, important health concepts. Having a solid foundation of how to access information ultimately influences health behavior, Kelley said.

“More accurate and accessible health knowledge ultimately leads to better-informed health behaviors,” Kelley said.

COMMUNITY INPUT BUILDS COMMUNITY HEALTH PROGRAMS

Community-based health programs function in a ground-up approach where community members have a say in how health programs are designed within their community or how health resources are distributed, Kelley said.

For example, community-based nutrition and exercise programs not only provide opportunities for fun and engaging connection among community members, but also provide opportunities for local organizations to support and enhance health by offering time-space products or services.

Kelley said that any community-based health program in Nebraska should start with a clear definition of who they want to serve and then spend time learning about the needs, priorities, and resources available to people.

“The goal of health literacy is for individual knowledge and skills to match environmental demands,” Kelley said. “Creating a health-literate environment is kind of a balancing act that takes into consideration the needs and capabilities of community members and taking steps to either improve those capabilities to match the environment, or to improve the environment to match those capabilities.”

Understanding environmental demands begins with a thorough understanding of the community to create a development plan that is more accessible, especially when working with a diverse community, Kelley said.

HEALTHIER COMMUNITIES ARE A TEAM EFFORT

In a health-literate community, people can make accurate judgements based on risk and benefits and use judgments to take action for greater well-being, Kelley said. Community-based health is built upon an understanding of the real and perceived needs, resources, and priorities of people in community settings.

“The more communities think intentionally about cultivating an environment that encourages people to share their wants and make their needs known, the better they can promote health,” Kelley said.



Megan Kelley and students conduct a community health needs assessment survey at a local event. (L-R: Selma De Anda, Ricardo Hernandez, Megan Kelley, Megan Fletcher, Oladapo Akinmoladun)

Components of community-based health include both physical and social aspects. The physical aspect focuses on access to resources, such as healthy foods or safe environments, and sources of knowledge. The social aspect of community-based health considers the relationships with institutions, professionals, and coaches.

Kelley said access to resources and environmental factors can best be addressed when the community members are included in the creation of programs.

“The more in touch communities are with the needs of their members, the better they can create supportive environments to promote their health,” Kelley said.

When health institutions, professionals, and coaches take the time to prioritize the needs and perspectives of the community they are working with, community leaders are more likely to feel invested in the programs as well, Kelley said.

“ The more communities think intentionally about cultivating an environment that encourages people to share their wants and make their needs known, the better they can promote health. ”

— *Megan Kelley* —



KEY TAKEAWAYS

- 1 Individual health literacy is based on the ability to find, understand, and apply information.
- 2 People can practice better health behaviors when they are able to possess accurate health knowledge and to address barriers to health in their local environments.
- 3 Community-based health promotes the needs, resources, and priorities of people in community settings.
- 4 Community-based health promotion takes an approach where community members drive decisions about their own well-being.
- 5 Success of community-based health programs is dependent on understanding the needs of the community.



Jill O'Donnell

THE YEUTTER INSTITUTE PROVIDES TRADE INSIGHTS TO NEBRASKA COMMUNITIES:

Providing International Trade Resources to the State

Interview with Jill O'Donnell
by Haley Ehrke

The Yeutter Institute at the University of Nebraska-Lincoln educates both university students and the general public about international trade and its impact on Nebraska's economy. The Yeutter Institute began in December 2017 and serves as a focal point for education, research, and public engagement related to international trade.

"The Yeutter Institute is a platform for discovery about international trade, how it works, and the impacts it has on Nebraska lives, business decisions, and the economy," said Jill O'Donnell, director of the Yeutter Institute.

U.S. agriculture is incredibly productive, and with nearly 95% of the world's consumers living outside of the United States, export markets are vital, O'Donnell said.

Nebraska exported approximately \$6.8 billion in agricultural goods in 2018. The Yeutter Institute teaches the process of international trade to help all Nebraskans understand it.

"Trade tends to get intertwined with discussions

about global competition, workforce needs and the jobs of the future — all very critical to rural economic vitality in Nebraska," O'Donnell said. "As an organization with an interdisciplinary mission, the Yeutter Institute brings these dynamics together to educate and illuminate."

A FOCUS ON STUDENTS AND PUBLIC ENGAGEMENT

The Yeutter Institute engages both students and the public in various ways.

The Yeutter Institute held a trade negotiation simulation mini-course in the spring of 2019. The course allowed students from 12 different majors to come together and practice a trade negotiation, with each student representing a different country or coalition.

"The Yeutter Institute is a place for students from every major to study international trade from various angles and gain exposure to the career paths that are available to them in the area of international trade," O'Donnell said.

Additionally, the Yeutter Institute actively works with students on professional development in the international trade arena. That effort began with a group of three Honors interns, who each chose a research question related to trade and prepared a briefing paper. The interns received feedback and published the papers on the Yeutter Institute website [yeutter-institute.unl.edu/student-projects] to share findings with the public. Expanding on this idea, in August 2020, the institute launched a “Yeutter Student Fellows” program consisting of 13 undergraduate students who will work as a cohort on professional deliverables related to international trade.

For the public, the Yeutter Institute hosts an annual international trade conference in the fall. In October 2019, the conference was titled, “What’s on the Horizon for International Trade?” The conference hosted numerous distinguished trade experts from both coasts of the United States and Canada, including keynote speaker Edward Alden, Ross Distinguished Visiting Professor at Western Washington University and senior fellow at the Council on Foreign Relations, and John Weekes, Canada’s former Ambassador to the World Trade Organization. During a student-led panel, students interviewed Darci Vetter, former U.S. Chief Agricultural Negotiator, asking tough questions about trade policy.

“Over the last few years, trade policy has been changing rapidly and on numerous fronts,” O’Donnell said. “The Yeutter Institute’s 2019 conference was an opportunity for Nebraskans to hear directly from trade policy shapers and researchers about the context for these changes as well as their impacts on the global trading system, the United States and Nebraska.”

The Yeutter Institute also maintains an “International Trade and Finance Calendar” on its website, with trade-related online events, Congressional hearings, and government requests for public comment. This resource is for anyone seeking ways to learn more about trade or weigh in on trade policy.

Finally, the Yeutter Institute launched a podcast called “Trade Matters.” Each episode features a different guest. Guests have included Mexico’s chief negotiator on the U.S. Mexico Canada Agreement, Ken Smith Ramos; former Defense Secretary Chuck Hagel; and Nebraska Governor Pete Ricketts. The podcast helps the public unpack various perspectives on trade and discuss ways it impacts

the Nebraska economy. The podcast can be found at yeutter-institute.unl.edu/podcast.

“The forces and institutions that make international trade possible tend to operate in the background of our lives; they aren’t always visible or tangible,” O’Donnell said. “The Trade Matters podcast brings these dynamics into focus, and my hope is that it helps make trade relatable.”

CLAYTON YEUTTER’S LIVING LEGACY

The Yeutter Institute is an interdisciplinary program formed by three colleges, the College of Agricultural Sciences and Natural Resources (CASNR), the College of Business, and College of Law.

The Yeutter Institute is based on an idea from Clayton Yeutter, a Eustis, Nebraska, native who earned degrees in Agricultural Economics and Law from the University of Nebraska–Lincoln.

He later served as the U.S. Trade Representative for President Ronald Reagan, as well as the U.S. Agriculture Secretary for President George H.W. Bush. His many achievements have had a lasting impact on the world economy.

Clayton Yeutter wanted to bring this expertise back to the state of Nebraska, and so, the Yeutter Institute began.

“Clayton Yeutter often said that the University of Nebraska produces graduates with great leadership attributes and that impacting the lives of students is the pathway to changing the world,” O’Donnell said. “He thought it was important for the next generation of leaders to have a solid understanding of international trade and finance. Today, his legacy guides the work of the Yeutter Institute.”




A statue honoring Clayton Yeutter graces one of the gardens on the University of Nebraska–Lincoln’s East Campus.



KEY TAKEAWAYS

- 1** Agriculture is critical to the state of Nebraska and understanding international trade is vitally important to the success of the industry.
- 2** The Yeutter Institute teaches how international trade works and the impacts it has on Nebraska lives, business decisions, and the economy.
- 3**  The Yeutter Institute creates public engagement through trade simulations, Honors student briefings, a podcast called “Trade Matters,” and an annual International Trade Conference open to the public.
- 4** Clayton Yeutter was a notable alumni of the University of Nebraska-Lincoln. His legacy of the Yeutter Institute is one that will continue to impact the economic vitality of Nebraska for years to come.

 For more information on Yeutter Institute trainings and conferences, visit yeutter-institute.unl.edu.

“ The Yeutter Institute is a platform for discovery about international trade, how it works, and the impacts it has on Nebraska lives, business decisions, and the economy. ”

— *Jill O'Donnell* —



Yeutter Institute Director Jill O'Donnell interviews Nebraska Governor Pete Ricketts for the inaugural episode of the Trade Matters podcast.



Chris Chizinski

SHOOTING FOR ECONOMIC SUCCESS: How Hunting and Fishing Drive Nebraska's Economy

*Interview with Chris Chizinski
by Katie Bresnahan*

Nebraska's ecosystems and wildlife are among the most diverse in United States — from mule deer in the Nebraska Sandhills in the north, to big horn sheep in the Wildcat Hills in the west, to bass and sunfish in the eastern lakes, and dozens of different waterfowl species that migrate along the Platte River.

Nebraska wildlife attracts thousands of hunters, anglers, and admirers each year, generating millions of dollars for conservation and the Nebraska economy, according to Chris Chizinski, associate professor in the School of Natural Resources at the University of Nebraska-Lincoln.

Chizinski focuses on understanding ways people interact with the outdoors and the impact this interaction has on wildlife. He studies why the interactions between wildlife and people are important, with strong implications for rural economies in Nebraska, and what could happen if these interactions no longer existed.

HUNTING AND FISHING REEL IN BIG BUCKS

Most of the funding state agencies use to manage fish and wildlife come from wildlife-based recreation like hunting and fishing, according to Chizinski. The money that outdoorsmen spend on their sport directly benefits Nebraska's short-term economic gain and long-term conservation. Chizinski said there are various ways funding is gained.

First, when hunters buy guns, ammunition, and other hunting equipment (or fishing equipment), an 11% excise tax (a tax collected when certain goods are purchased) is reimbursed from the federal government to the state government for conservation and management of the state's fisheries, wildlife, and habitat. Without this money, Chizinski said there would be little funding for wildlife and habitat conservation in Nebraska.

Second, hunters and fishermen are required to purchase state permits to engage in their sport. Chizinski said the purchase of permits also helps fund the Nebraska Game and Parks Commission,

habitat protection, research and education, and public access for fishing and boating. The Nebraska Game and Parks Commission protects fish, wildlife, parks, and outdoor recreation resources in Nebraska with long-term sustainability in mind.

Finally, waterfowl hunters are also required to purchase the federal duck stamp (a conservation revenue stamp). The stamp is one of the most effective conservation purchases a wildlife enthusiast can make to support birds and other wildlife in Nebraska because it goes directly to conservation. While duck hunters are required to purchase the stamp, other wildlife lovers are encouraged to purchase this stamp because of the large impact in aiding habitat and Nebraska's economy. Chizinski said the duck stamp is \$25 where approximately \$24.50 is used to conserve Nebraska wetlands.

KEEPING SMALL TOWNS VIBRANT

Beyond the monetary value to the state, Chizinski said that hunting and fishing serve as an economic lifeline for small, rural towns across the state. These towns depend on hunting and fishing ecotourism as a source of income to keep small businesses open throughout the year.

"In Nebraska, billions of dollars come from hunting and fishing in a year, which in part, is spent in small towns for food and lodging," Chizinski said.

Hunting and fishing seasons bring in hundreds of nonresidents to local cafes, gas stations, hotels, and small businesses, and serve as a vital revenue source for rural towns. Without the nonresident spending, many small-town businesses would struggle to stay open.

"It is important to keep people interested and able to participate in outdoor activities, not only to fund conservation, but also to keep small towns up and running," Chizinski said.

KEEPING WILDLIFE IN CHECK

Without the funding provided by hunters and fishermen, it would be difficult to properly manage fish and wildlife populations and likely lead to a rapid decline in habitat and wildlife. According to Chizinski, without proper management, overpopulation issues in species like deer, would lead to crop destruction, lost yields for farmers, and increased motor vehicle accidents involving wildlife.

Additionally, Chizinski said the spread of disease in overpopulated wildlife species becomes uncontrollable without the Nebraska Game and Parks Commission management. Much like humans, close proximity and large populations in wildlife results in rapid disease spread. These concerns could cause major economic and environmental issues making wildlife management essential to Nebraska.

KEEPING PEOPLE INVOLVED

To avoid a loss of hunters and fishermen in Nebraska, Chizinski suggests the "Three R's" — *Recruitment, Retention and Reactivation*.

- *Recruitment*: bringing new people into the state
- *Retention*: keeping current hunters/fishermen active to continue hunting/fishing and purchasing licenses
- *Reactivation*: encouraging outdoorsmen who have dropped or lapsed back into the system to purchase permits

One of the major challenges facing the "Three R" strategy is providing enough and diverse access to hunters and anglers. Chizinski said access includes places to hunt, people to hunt with, equipment, and knowledge. These factors make getting involved in outdoor sports challenging, expensive, and stressful.

Through his research, Chizinski tackles this issue looking for ways to educate people and create opportunities to become — or stay — involved in outdoor sports.

Current Ways to Get Involved

Anyone interested in getting involved for the first time or getting back into outdoor activities, such as hunting and fishing, has many opportunities in Nebraska.

1. Contact the closest Game and Parks office or visit www.outdoornebraska.gov to find the countless opportunities to start and connect with people who are passionate about guiding.
2. Participate in workshops. Chizinski hosts workshops with the Nebraska Game and Parks Commission teaching collegiate students how to hunt. Through these workshops, students have the opportunity to sign up for a hunt with a mentor during the spring turkey season. Opportunities like this allow students to try hunting with proper education and without pressure.
3. Join conservation organizations such as *Ducks Unlimited* or *Pheasants Forever*, and other sportsmen organizations that help interested people get and stay involved in the sport by creating a “social habitat.”

“Being involved in the outdoors is good for the wildlife, for the sportsmen, and for the economy,” Chizinski said.

MORE INFORMATION

For more information about fishing and hunting research in Nebraska or to learn how to get involved, visit fishhunt.unl.edu.

“ It is important to keep people interested and able to participate in outdoor activities, not only to fund conservation, but also to keep small towns up and running. ”

— Chris Chizinski —



KEY TAKEAWAYS

- 1 Most of the funding that state and federal agencies use to manage and research fish, wildlife and habitat comes from sport hunting and fishing.
- 2 Small towns in Nebraska depend on the ecotourism dollars brought in by hunters and fishermen.
- 3 Without the funding provided by hunters and fishermen, the Nebraska Game and Parks Commission may not exist, which would likely lead to a rapid decline in habitat and in wildlife.
- 4 Hunting and fishing are vital economic drivers for Nebraska. Involvement makes a large impact on Nebraska’s economy and ecosystems.



It is easy to get involved in hunting and fishing. Visit fishhunt.unl.edu to get started.



Duck hunting decoys on the Platte River



“ Early on, we thought entrepreneurship was about building companies, and then we figured out that it was really about building people, and those people build great companies. ”

— Tom Field —

Entrepreneurship Offers Return to Rural Nebraska



Surin Kim

ENTREPRENEURSHIP IGNITES RURAL NEBRASKA: Experiential Entrepreneurship Education for Youth and Community

*Interview with Surin Kim
by Emily Frenzen*

Some small towns in Nebraska are seeing a decline in population, but recent programming for high school students indicates that experiential entrepreneurship education opens a door for youth to return to rural communities.

“Experiential entrepreneurship education is a hands-on method of teaching entrepreneurship to youth,” said Surin Kim, Entrepreneurship Extension specialist and assistant professor in the Department of Textiles, Merchandising and Fashion Design at the University of Nebraska-Lincoln.

Learning is not hypothetical in the experiential entrepreneurship model, but rather students solve real problems for their rural towns. Particularly, students are challenged to think like entrepreneurs in the development of products or services for local businesses.

Kim said entrepreneurship provides youth an opportunity to create something unique, as it is a vehicle for solving problems in a new way. This might even be one way to help revive rural Nebraska and its economy.

“Students who have a desire for social impact are often drawn to entrepreneurship because they have a desire to create something that can have a positive impact in society,” Kim said.

Entrepreneurship can help encourage youth to return to rural Nebraska and bring innovative businesses to communities.

STUDENTS TAKE THE REINS, COMMUNITY GAINS

Experiential entrepreneurship education allows students to become agents of change for local businesses and community organizations.

An interdisciplinary faculty team developed the *Youth Entrepreneurship Clinics* (YEC) to provide high school students with this experience. The team includes Maria de Guzman, youth development Extension specialist and associate professor in the Department of Child, Youth and Family Studies; Claire Nicholas and Surin Kim, assistant professors in the Textiles, Merchandising and Fashion Design program; Andrew Larson, Nebraska 4-H Extension educator; and graduate students. The program

is sponsored by the Rural Futures Institute, the United States Department of Agriculture (USDA), and anonymous foundation donors.

During the program, students use a hands-on business challenge approach where they analyze problems, understand potential customers, and gauge potential impact to create solutions for local businesses. By being fully immersed in the process, students gain stronger connections to the communities because they are — themselves — the decision makers.

Kim and the team work with students to determine how to serve customers beyond geographic locations, as some rural businesses have greater physical distance from resources. Students create scenarios specific to the business to reach meaningful conclusions for both the business and the community. Students make all decisions together and provide suggestions.

Kim said the program is beneficial for both the students and the communities. Specifically, students provide the communities with solutions and offer connections for future employment opportunities. The program also teaches students to have greater ownership in their lives as they gain an entrepreneurial mindset. An entrepreneurial mindset thinks *outside* of the box to *create opportunities* by understanding the current market situation and using existing resources to solve problems.

“Students have a stronger sense of control in experiential entrepreneurship education because they can use the entrepreneurial mindset they learned to build something from scratch in many other settings,” Kim said.

When youth understand situations, know how to identify opportunities, and learn how to create value, they begin to steer their own lives, whether or not they become business owners, Kim said. That said, an experiential entrepreneurship education does not require students to be entrepreneurs from the beginning.

“This learning approach is not about specific knowledge or skills, but rather the willingness to explore the process of entrepreneurship in a fast-paced, ever-changing society,” Kim said.

Instead, students develop critical life skills that can be applied in various careers.

A CULTURE THAT CELEBRATES FAILURE

A culture of failure takes pressure away from youth making mistakes. Creating a culture for youth that not only accepts but also celebrates failure is a long-term investment for rural communities that want to thrive.

Kim said youth need to be comfortable to make mistakes, or fail, especially when they are trying something for the first time and building potential for a greater purpose.

“Entrepreneurs create value and create jobs for segments that have not been previously served,” Kim said.

However, students cannot be successful in creating value or creating jobs without embracing failure, according to Kim. If the culture chooses to resist failure, people are less likely to be innovative.

“Innovation is the byproduct of failure,” Kim said. People who are not scared to create something new are more likely to create stronger developments.

Trying something that has never been done before means that the chances of failure are high. Since it is probable for failure to occur, getting comfortable with that reality and learning from the failure for the next round of innovation is a key piece of the puzzle.

“I see a lot of hope in the future generation that is especially creative and dedicated to making an impact,” Kim said.

Therefore, the entrepreneurial mindset is something to be nurtured by a supportive culture when teaching entrepreneurship. This is because there is rarely one hero in the story of an entrepreneurial journey, according to Kim.

An aspiring entrepreneur may have a good idea for a business model; however, it is the culture that is comfortable with failure that encourages a student to bring the idea in an extraordinary way.

“It’s not fair to ask an individual ‘Why don’t you try?’ if we don’t have a safety net or supportive culture of trying and failing,” Kim said.

Find more information about the program: entrepreneurshipclinics.com.



KEY TAKEAWAYS

- 1 Entrepreneurship provides youth with greater opportunity in rural Nebraska because they gain ownership of their lives and connection to communities.
- 2 Experiential entrepreneurship education is a method of learning in which students solve real problems for real communities.
- 3 Entrepreneurship is a driver for community vitality as students create unique value from existing resources.
- 4 If a community culture becomes more comfortable with failure, entrepreneurs are more likely to innovate.
- 5 A culture that celebrates failure is achieved by having a supportive community that encourages people to try to create something new.



Find more information about the program, visit entrepreneurshipclinics.com

“ This learning approach is not about specific knowledge or skills, but rather the willingness to explore the process of entrepreneurship in a fast-paced, ever-changing society. ”

— Surin Kim —



High school students participating in Surin Kim's Youth Entrepreneurship Clinic.



Surin Kim with the USDA National Institute of Food and Agriculture Team.



Tom Field

ENGLER AGRIBUSINESS ENTREPRENEURSHIP DRIVES ECONOMIES : Entrepreneurship Provides New Wave of Rural Businesses

Interview with Tom Field

by Taylor Nuss

Every fall, a new wave of students enters Miller Hall at the University of Nebraska–Lincoln to begin a journey of building an entrepreneurial business. From the moment they step inside the building, they are recognized as more than students — they are owners of future businesses developed in the Engler Agribusiness Entrepreneurship Program, planting roots all across Nebraska and serving people nationwide.

The program is inspirational because of the character-building process that is included in the course design.

“Early on, we thought our job was to build companies, and then we figured out that it was really our job to build people, and those people would build great companies,” said Tom Field, Director of Engler Agribusiness Entrepreneurship Program at the University of Nebraska–Lincoln.

Engler students help to stimulate the economy by introducing new goods and services to the marketplace across the state, creating jobs, and paying taxes.

Many of the ventures eventually become thriving enterprises and the identity of Nebraska is built by the emerging success stories.

FAIL FORWARD, FAIL FAST, FAIL CHEAP... LEARN LIKE CRAZY

One principal takeaway of the Engler program is learning the *art of failure*.

Instead of lectures, Field said Engler students learn through experiences and shared wisdom from a community of peers and mentors. One piece of wisdom is for students to become comfortable with failing. To be innovative, students will have multiple failed attempts before something works best.

The program consists of short, intense modules taught from entrepreneur experts holding undergraduates to high standards. In Engler, lessons are often learned through multiple failed attempts, and those attempts are an important piece of any entrepreneur’s story.

According to Field, one of the famous mantras of the Engler program is, “Fail Forward, Fail Fast, Fail Cheap...Learn like Crazy!”

Field said failed attempts build lifelong character traits of perseverance and innovation carrying entrepreneurs through their professional careers.

SUPPORT LOCAL

The courageous pursuit of entrepreneurship owns many risks, but most times, the offset is freedom. Freedom inspires entrepreneurs to settle in rural Nebraska where they can be a factor in the survival of their hometown. But, in order to contribute to rural Nebraska, they must have community support.

Field said approximately 95% of Engler graduates aspire to live and work in Nebraska, but establishing roots in rural areas can be challenging for entrepreneurs as not everyone is going to accept the new innovations.

An important aspect of community vitality in rural Nebraska lies in the support that the community has on people and businesses, according to Field. Supporting local businesses is crucial to their success. Entrepreneurship offers rural communities the chance to thrive.

Field said that entrepreneurs are compassionate people who love their communities, love their families, love their neighbors, and will work in the hardest way to build something.

“If we can have the wisdom to support them and stay out of their way, then we will build the kind of state we really want,” Field said.

ENGLER SUCCESS: TRACTORMAT

A prime example of an Engler success story that has served farmers across the country, is the company TractorMat, created and owned by Thomas Kayton, a 2018 graduate of the Engler program.

TractorMat was sparked by a common chore Kayton had growing up as a kid — cleaning out vehicles. Kayton wanted to design custom, removable floor mats for farm machinery to make this process easier. Upon joining the Engler program, Kayton brought his passion to life by borrowing his parent’s minivan to travel around Nebraska and sell mats.

“TractorMat is exciting because Thomas did not wait for us to give him permission,” Field said. “He just went and did it and then we supported him and helped him grow it. That is a true entrepreneur.”

Field said it is entrepreneurs like Kayton that bring businesses, jobs, and ideas to rural Nebraska, which drives communities and its economy.

TractorMat is one of the many success stories to come out of the Engler program.

WOMEN’S ENTREPRENEURIAL INITIATIVE

There are many opportunities for involvement within Engler, and all are founded by students. One example is the Women’s Entrepreneurial Initiative — a program that embodies strong women in leadership positions. This program is based on the challenges women face as business owners. The group of women meet every week to have transparent conversations and support each other through their endeavors as entrepreneurs.

“At the start, women were not launching companies quite at the same rate as men and we could not figure it out because it certainly was not an issue with talent,” Field said. “We found that women needed to have a place where they could talk to each other and be transparent and genuine with each other. This initiative accomplishes that goal.”

This initiative is essential for building women of strong character and confidence that will one day control a thriving enterprise.

BUILDING LONG-LASTING COMMUNITY

The Engler program establishes a true sense of home for many students. Embellishing the walls of Miller Hall are photos of trademarked businesses as a result of the program.

Meandering deeper through the classrooms, legendary mottos are hand painted on the walls. The Engler program is more than community — it is lifelong friends and family.

The relationships between classmates and professors live long after graduation. The alumni are very active and a great resource for students active in the program. Alumni provide a source of wisdom and networking connections for students. There are many opportunities for involvement within Engler and they are all founded by a deep sense of ownership by students, yielding a community of entrepreneurs ready to create the future.

“ One of the famous mantras of the Engler program is, Fail Forward, Fail Fast, Fail Cheap... Learn like Crazy! ”


— Tom Field —



Tom Field working with a student during the annual Engler Hunger Games Rally.



KEY TAKEAWAYS

- 1 Engler students stimulate the economy by introducing new goods and services to the marketplace across the state, ultimately creating jobs and paying taxes.
 - 2 Engler students learn through experiences, shared wisdom from a community of peers and mentors, and failed attempts. As a result, they build lifelong character traits of perseverance and innovation that carry through their professional careers.
 - 3 An important aspect of community vitality in rural Nebraska lies in the support that the community has on people and businesses. Supporting local reinforces entrepreneurs, aids the economy, and benefits rural Nebraska.
 - 4 Women's Entrepreneurial Initiative is a program that embodies strong women in leadership positions and aids those women in becoming bold bosses of future enterprises.
 - 5 The Engler program is more than community, it is lifelong friends and family.
-  For more information about the Engler Agribusiness Entrepreneurship Program, visit engler.unl.edu.



“ If we work together, we can develop the hazelnut crop over time and have an alternative crop for the Midwest — and for the Great Plains — where people can diversify their operations. ”

— *John Erixson* —

Economic Vitality in Farm Production



John Erixson

HAZELNUTS ADD FLAVOR TO NEBRASKA AGRICULTURE: Hazelnuts Diversify Operations, Utilize Unproductive Soils

Interview with John Erixson
by Alex Voichoskie

Hazelnuts add flavor to a morning cup of coffee, but the nut also has potential to be a source of diversity for Nebraska producers, adding value to the state's crop, livestock, biofuel, and food industries.

The Nebraska Forest Service (NFS), under the Institute of Agriculture and Natural Resources (IANR) at the University of Nebraska-Lincoln, is leading this effort. NFS Director John Erixson and his team study ways to commercially produce hazelnuts in Nebraska.

Hazelnut production, according to Erixson, can help rural Nebraskans generate additional revenue by diversifying crop operations, utilizing unproductive soils, and developing value-added food, feed, and biofuel products.

"The work that we are doing with hazelnuts is on the leading edge of hazelnut production," Erixson said.

This cutting-edge research may offer Nebraskans an opportunity to incorporate another crop in their operations to diversify their income.

HAZELNUTS ADD DIVERSITY AND CREATE VALUE

Hazelnuts are a \$3.5 billion industry worldwide primarily used in chocolate, confectionaries, flour, and oil, Erixson said.

In the United States, Oregon produces 99% of the country's hazelnut crop. However, Erixson and his team have identified the suitable growing conditions for hazelnuts and determined that Nebraskans could become substantial contributors to the nation's hazelnut supply because of the state's diverse soil profile.

For Nebraska, Erixson primarily focuses on developing a hazelnut hybrid that grows well in a wide range of soil types. This trait would allow the crop to grow in the sandy soils of western Nebraska to the rich clay soils of eastern Nebraska.

"We want to be able to use the hazelnut plant as a filler in those areas where hazelnuts would not naturally grow or use those soils that are not as productive as others," Erixson said.

In addition to utilizing less-productive soil, hazelnuts can benefit Nebraskans in another way: the nuts produce more oil than soybeans.

For example, Erixson said hazelnuts produce about 125 gallons of oil per acre, whereas soybeans produce 90 gallons per acre. With more available oil, scientists are finding ways to use hazelnut oil in biodiesel and expanding the value-added opportunities for hazelnut producers.

Hazelnut oil provides another benefit as it gels at a lower rate than soybean oil, Erixson said. This would allow biodiesel users to gain more use of hazelnut biodiesel in the winter months versus soy biodiesel.

HAZELNUTS IN NEBRASKA

There are important market challenges for hazelnuts despite research to expand commercial hazelnut production in Nebraska, according to Erixson.

First, Erixson said the plant takes four to five years to produce nuts once it is planted. However, once it begins nut production, the plant can produce nuts for 40 to 50 years.

In addition, there are currently no bulk processing facilities for hazelnuts or hazelnut oil in Nebraska, nor are there equipment or implement dealers to supply growers with the necessary tools for commercial hazelnut production.

“There are some potential advantages for hazelnuts,” Erixson said. “We currently have the infrastructure to create biodiesel out of soybeans. Not all those pieces are in place just yet for hazelnuts, but we are working with the university’s Department of Biological Systems Engineering to see what it is going to take to do that.”

Despite the demand for and shortage of hazelnuts, the plants are not readily available for commercial planting yet. Erixson said the short-term goal is to encourage backyard and hobby farmers to experiment with hazelnut production as an added commodity and source of income for Nebraska’s producers.

“Whether it is the hobby farmer or the backyard farmer, all production can happen today,” Erixson said.

In the next five years, Erixson expects to see hazelnut plants available for large-scale production, nuts and confectionaries sold at local farmer’s markets, and hazelnut oil researched for biodiesel development.

“If we work together, we can develop this crop over time and have an alternative crop for the Midwest — and for the Great Plains — where people can diversify their operations,” Erixson said.

ON-FARM CONSORTIUM RESEARCH

Erixson’s research team — started by former NFS director Scott Josiah nearly 20 years ago — is part of the Hazelnut Hybrid Consortium. The consortium is comprised of the NFS, the Arbor Day Foundation, Oregon State University, and Rutgers University. Each member of the consortium plays an integral role in developing hazelnut hybrids to increase production across the United States.

In addition to creating a hazelnut hybrid producing larger nuts and higher yields, the consortium is also focused on creating a hybrid that is resistant to Eastern Filbert blight, a fungus that grows on hazelnuts.

“We are trying to mix the two hazelnut breeds — European and American — to come up with not only a nut that is resistant to the blight, but also one that grows in the Great Plains that can provide an opportunity for others to raise hazelnuts,” Erixson said.

The consortium recently secured a \$3.1 million grant from the U.S. Department of Agriculture to assist in plant testing, Erixson said. Advancing from the first concept of crossing hazelnut plants to actually producing productive plants is a 15-year process. The grant enabled the consortium to expand research into Nebraska.

On-farm consortium research is conducted at Horning Farms near Plattsmouth, Nebraska, to test the disease resistance, nut size and shape, and yield. The best hazelnut plants are selected, put into tissue cultures, and cloned at the university to create more plants.



KEY TAKEAWAYS

- 1 Nebraskans could become substantial contributors to the nation's hazelnut supply because of the state's diverse soil profile and suitable growing conditions.
- 2 Hazelnuts are a \$3.5 billion industry worldwide, used in products including chocolate, confectionaries, flour and oil.
- 3 Hazelnuts produce about 125 gallons of oil per acre, whereas soybeans produce 90 gallons per acre.
- 4 Despite the demand for and shortage of hazelnuts, the plants are not readily available for commercial planting yet, because a plant takes four to five years to produce nuts once it is planted.
- 5 Once the plant begins nut production, the plant can produce nuts for 40 to 50 years.



To learn more about the impact the Nebraska Forest Service has on the state of Nebraska, visit nfs.unl.edu.

“ The work that we are doing with hazelnuts is on the leading edge of hazelnut production. ”

— *John Erixson* —



Hazelnut growers with a 5-year-old, multi-stem hazelnut tree form.



Hazelnut production in a green house.



Simanti Banerjee

THE BIG PICTURE OF FARMLAND CONSERVATION POLICIES: Keeping Nebraska’s Environment and Economy Viable

*Interview with Simanti Banerjee
by Lexi Kaiser*

Involvement in conservation policies helps preserve farmland and brings additional income into Nebraska communities. A conservation policy is a policy that works to preserve natural resources or ecosystems.

Simanti Banerjee, associate professor in the Department of Agricultural Economics at the University of Nebraska–Lincoln, said conservation policies help generate environmental benefits, contribute to maintaining farm survival, keep rural communities afloat, and contribute or maintain the economic vitality of the state of Nebraska.

Banerjee works to increase participation in farmland conservation policies by focusing on policies providing financial compensation to participants.

To do so, Banerjee researches different ways to provide information about environmental benefits and other’s choices to incentivize people to participate in policies. When a policy is implemented, the hope is for producers to include the conservation practice within their operation and reap the benefits. If a policy is not designed

correctly, however, it could result in unhappy producers who refuse to participate.

Banerjee devotes her work to helping policymakers design programs that work for the Nebraska lifestyle.

CONSERVATION POLICIES PROVIDE COMPENSATION

Banerjee said many farmland conservation policies involve financial compensation, which helps attract more participation in the policy.

“Financial compensation means the government will share the cost for any kind of practice that the producer would implement on their property or provide compensation for costs incurred for implementing the practice,” Banerjee said.

Producers see direct benefits from the financial compensation because it provides an additional income source outside of producing commodities.

Banerjee said one example of participation conservation practice is planting strips of

native prairie grasses onto intensively managed agricultural land. Doing so preserves the nutrients of their soil, while also increasing the populations of pollinators for the entire area and provides financial payment for involvement.

“Planting strips of native prairie grasses leads to improved pollinator habitat and lower soil erosion,” Banerjee said. “All benefits to natural resources.”

If producers implement this practice they can receive financial payment.

While producers can control what they do with their land, they cannot always control the volatile markets. Therefore, Banerjee said compensation policy conservation can serve as a safety net for producers by adding a source of income when they are not seeing profits due to low commodity prices.

“The payments from these policies can serve as a buffer that might prevent these farms from going out of business,” Banerjee said.

CONSERVATION POLICIES BENEFIT SOCIETY

When participation increases in conservation policies, society and the future generation of agriculture producers benefit.

“The most significant benefit of the conservation programs is the public good,” Banerjee said. “For instance, communities can see improved water quality, higher pollinator biodiversity, and animal habitat.”

Increasing the participation in farmland conservation policies creates more social capital within rural communities. Specifically, neighbors in farming communities can work together to preserve the environment and heighten the quality of life for the area.

“By increasing participation, communities see an increase of trust and social networks,” Banerjee said. “In the long run, it will lead to greater delivery of improved environmental benefits, or ecosystem services.”

The next generation of farmers rely on the resiliency of the family farm. Farmland conservation policies ensure that the land will be properly maintained to continue to supply the food system.

PLOWING THROUGH THE BARRIERS

Even though there are strong benefits to conservation policies, Banerjee recognizes the barriers that keep farmers from participating. She specifically studies how the barriers influence the decision-making process for producers.

One critical barrier is the transaction costs associated with participation. For example, paperwork is a cost that could influence a producer’s decision-making process simply due to the amount of time it takes to complete the application.

“Producers are busy people and we do not want them to be mired in paperwork,” Banerjee said. “Transaction costs matter.”

Banerjee notes the importance of the policy design and has worked with policymakers to make it workable for both sides.

“At the end of the day, if society needs a policy in place, we need to know how to effectively formulate and implement that policy to maximize benefits and minimize costs to society,” Banerjee said. “The regulator needs that answer, so that is what we are trying to do for Nebraska.”



Strips of native prairie grasses lead to pollinator habitat and lower soil erosion.



KEY TAKEAWAYS

- 1 Involvement in conservation policies helps preserve Nebraska's rich farmland and brings additional income into rural communities.
- 2 Simanti Banerjee provides information on how to incentivize people to participate in policies.
- 3 The typical farmland conservation policy involves financial compensation, meaning the government will share the cost for producers to implement land uses that generate environmental benefits.
- 4 When participation in conservation policies increase, more environmental benefits are created for producers, members of society, and future generations.
- 5 Compensation provided by conservation policy participation can serve as a safety net for producers by being an additional source of income when they may not be seeing profits because of low commodity prices.

“ Conservation policies help generate environmental benefits, contribute to maintaining farm survival, keep rural communities afloat, and contribute or maintain the economic vitality of the state of Nebraska. ”

— *Simanti Banerjee* —



Taylor Ruth and Ismail Dweikat

HEMP – A PLANT TO LIGHT UP NEBRASKA’S ECONOMY: An Investment for Nebraska Farmers

Interview with Ismail Dweikat and Taylor Ruth

by Alice Akers

The hemp plant has the potential to change the landscape of Nebraska’s current crop production and act as a driving force for the state’s economy. However, misconceptions about hemp may inhibit its success in Nebraska.

Both hemp and marijuana come from the same plant species, but each has a different chemical composition and the uses and restrictions of each are quite different. Education on hemp and its potential benefits can help the public overcome misconceptions. In turn, support for a hemp market in Nebraska might begin to emerge.

Researchers at the University of Nebraska-Lincoln are working on these projects.

Taylor Ruth, assistant professor in the Department of Agricultural Leadership, Education and Communication, studies the public perception of hemp with the goal of creating messages about the plant’s value. Ruth said people must first understand the crop before a market for hemp can be developed.

Ismail Dweikat, professor in the Department of Agronomy and Horticulture, develops varieties of hemp seeds that are adapted and suited for the state’s environment to ensure the hemp seed can thrive in Nebraska’s climate. Dweikat said hemp would be a suitable rotation crop for farmers across the state.

Together, this work provides a potential new avenue for farmers in the state of Nebraska.

UNDERSTANDING HEMP

Hemp has distinct differences from marijuana. Dweikat said, although both are a cannabis plant, hemp lacks psychotropic properties. This means that hemp does not alter the brain chemistry.

Tetrahydrocannabinol, more commonly referred to as THC, is the main psychoactive compound in marijuana that alters the brain chemistry. In marijuana, THC levels can reach 30% depending on the strain. Levels in hemp are minuscule, in comparison.

“Industrial hemp is anything that has *less than* 0.3% THC,” Dweikat said.

Ruth said that clarifying the difference between hemp and marijuana is an essential first step of education about the hemp plant. Misunderstandings impact the public’s perception, which causes issues with acceptance of the plant.

HEMP BENEFITS

Hemp can be grown for various goods. To date, hemp is primarily grown for cannabidiol (CBD) or fiber. CBD is a type of natural compound found in hemp. Dweikat said CBD can be used for anxiety, pain, muscle disorders, and many other conditions. CBD can also be used in creams, oils, and even dietary supplements.

Additionally, Dweikat said a range of fiber products can be produced from hemp. The stalk of the hemp plant is divided into hurds and fiber. Hurds are the woody fibers on the interior of the stalk that can be used for paper, organic compost, animal bedding, and fiber board. The outer portion of the stalk has long, bast fibers. Dweikat said bast fiber can be used for textiles, insulation, rope, and molded plastics.

Many people likely do not know all of the uses of hemp, Ruth said. Nebraska legalized hemp production for fiber and CBD in 2019, so knowledge about the plant is still developing. Continued education about the plant is still needed.

HEMP AS A ROTATION CROP

Hemp used as a rotation crop not only provides the potential for an additional monetary value to farmers, but also can improve the soil for future crops.

Dweikat said farmers can benefit from the bioremediation that occurs naturally. Bioremediation is the process where hemp extracts toxins and pollutants from the soil and groundwater, thus helping clean up farmer’s soil.

By using hemp as a rotation crop, not only does it benefit the soil, but Dweikat said it also helps break insect cycles. Further, farmers who choose hemp over other optional rotation crops can benefit from the multifaceted plant by branching out to wider markets. In doing so, farmers can adjust more easily to fluctuations in various markets.

To grow hemp in Nebraska, farmers must first obtain a license from the Nebraska Department of Agriculture. Dweikat recommends that farmers start small, find a buyer for the produce, and determine which hemp crop is best to grow, based on the need for the buyer. For instance, the seed for growing hemp for fiber and growing hemp for CBD are different and the cost is different as well.

For example, Dweikat said the seed for fiber is much cheaper at \$5 per pound (one pound equaling approximately 20,000-50,000 seeds) compared to the seed for CBD, which is \$1 per seed.

SEED PRICES

Hemp for Fiber

\$5/Lb

1 Pound =
20,000-50,000
Seeds

Hemp for CBD

\$1/Seed



Growing hemp for CBD also introduces unique needs outside of being a rotation crop, according to Dweikat. For instance, farmers might consider using a greenhouse to reduce the chance of wild hemp pollinating the grown crop.

The main risk for farmers growing hemp is keeping the THC level less than 0.3%. If the plant is stressed during growing, the THC will increase. Excess heat and insect attack are two examples of stress that impact the crop. Unfortunately, Dweikat said crops that reach levels above 0.3% will be destroyed and unable to sell, Dweikat said.


The hemp industry is one of untapped potential, according to Dweikat — it awaits farmers to harness its full potential.

“Only 8% of the people in the United States use CBD, so there is potential for growth for the state of Nebraska,” Dweikat said.

For more information on hemp, visit the Nebraska Hemp Association at nebraskahempassociation.org/.



KEY TAKEAWAYS

- 1 The hemp plant has the potential to change the landscape of Nebraska's current crop production and act as a driving force for the state's economy.
 - 2 Industrial hemp has less than 0.3% THC.
 - 3 Hemp can be grown specifically for CBD or fiber.
 - 4 In order for hemp to be a crop that drives Nebraska's economy, the public has to support the crop.
-  For more information on hemp, visit the Nebraska Hemp Association at nebraskahempassociation.org.

“ Only 8% of the people in the United States use CBD, so there is potential for growth for the state of Nebraska. ”

— *Ismail Dweikat* —



Example of a hemp leaf and bud.



Travis Mulliniks

NEBRASKA – THE BEEF STATE: Cost-effective Solutions to Keep Nebraska Beef Vibrant

*Interview with Travis Mulliniks
by Lexi Kaiser*

Nebraska's economy is driven by a commodity deeply rooted in the state: beef.

Cattle production serves as one of the top industries in the state of Nebraska and the economy is dependent on the success of the sector, according to J. Travis Mulliniks, assistant professor in the Department of Animal Science at the University of Nebraska-Lincoln.

Mulliniks creates cost-effective, innovative animal management practices and systems for beef producers to adopt. However, Mulliniks said beef producers will need to continue to utilize both new *and* old technologies to increase the efficiency and profitability of their operation.

BEEF DRIVES NEBRASKA'S ECONOMY

Nebraska's success in the beef industry is attributed to agricultural lands, resources, and the type of producers within the state.

Mulliniks said the profitability of beef products drives the economic vitality of Nebraska and producers are now doing more with less.

For instance, beef producers feed the planet but have to do it with less available land. Mulliniks said agricultural land availability is not expanding, so producers must efficiently increase production on a fixed amount of land.

In order to keep up with increasing international trade and domestic consumption, continued improvement of the beef industry is needed.

Nebraska beef producers must also increase efficiency to maintain their position as the top beef producing state.

"Nebraska ranks number one in beef exports and in the number of commercial cattle harvested," Mulliniks said. "Our economy is driven by agriculture, so we must find ways to be more efficient in our work."

Furthermore, consumers rely on Nebraska to deliver a high quantity of quality beef. Mulliniks said the demand for beef products remains, as it is the highest quality, lowest cost protein source available.

KEEPING NEBRASKA BEEF PRODUCERS VIABLE

Beef producers can use Mulliniks' research to determine the most sustainable, efficient, and profitable animal management practices for their operation. Mulliniks suggests three strategies to increase profitability in beef production.

First, nutrition, or a strategic supplementation strategy, must be determined to decrease costs while maintaining or increasing productivity.

"Our environment and weather conditions are always changing so we must adapt nutritional plans to these changes," Mulliniks said. "Cows can be managed to become more resilient to these environmental stressors."

Further, producers can manage cows to have adaptive coping mechanisms to stressors which is driven by the nutritional strategy of the cowherd.

Second, cattle physiology, or genetic indexes and phenotypical traits of cows or an entire herd, need to be considered. A few examples of these traits would be mature cow size, genetic potential for milk production, reproductive traits, and growth indexes.

"We cannot control the environment, but we can control the type of cows we are keeping in our breeding program," Mulliniks said. "The most efficient cows are easily adaptable to environmental changes and have the ability to reset their requirements to match environmental conditions."

Third, Mulliniks said management strategies should focus on ways producers optimize land use and production system efficiency. This might include nutrition, reproduction, genetics, season of calving, alternative forage systems, marketing endpoints, changing the type of cattle utilized (yearling operation vs cow-calf herd), and managing cattle within the environment where cattle are raised.

Mulliniks said the goal of this three-pronged approach is to decrease costs, while still maintaining or increasing productivity for the producer's cow herd.

THE FUTURE OF CATTLE PRODUCTION

The success of livestock production keeps the state of Nebraska viable and provides benefits to rural communities.

"Range lands in Nebraska provide numerous ecosystem services," Mulliniks said. "There are benefits humans gain from functioning ecosystems, such as natural wildlife habitat, healthy plant communities, improved water infiltration, and healthy soil systems."

According to Mulliniks, producers can create added value to their operation utilizing other business ventures on their land. For instance, opening a hunting or ecotourism enterprise to the public increases the value of their operation and provides a financial safety net for producers.

"Beef producers should look at other avenues to stay flexible and add value to operations," Mulliniks said.

"The future will always be bright for the beef industry, but producers will have to be more creative in creating added value for their operation," Mulliniks said. "Producers can create added value for their ranch by these additional hunting enterprises."



Nebraska's economy is driven by a commodity deeply rooted in the state: beef.



KEY TAKEAWAYS

- 1 Nebraska's economy relies on the agriculture industry as beef production employs one out of four people across the state.
- 2 Nebraska's success in the beef industry is attributed to agricultural lands, resources, and the type of producers within the state.
- 3 Continuing to improve the beef industry is important to the sustainability of food systems and the state's economy.
- 4 To maintain vitality in beef production, producers must continue to adopt efficient technologies and management practices.
- 5 Travis Mulliniks suggests a three-pronged approach to decrease costs, while still maintaining or increasing productivity for a producer's cow herd.

“ Range lands in Nebraska provide numerous ecosystem services. There are benefits humans gain from functioning ecosystems, such as natural wildlife habitat, healthy plant communities, improved water infiltration, and healthy soil systems. ”

— *Travis Mulliniks* —



“ Student passions might be science, technology, engineering, math, nutrition, or agriculture. But our main goal is to help the youth succeed as an adult here in Nebraska, regardless of their interests. ”

— Kathleen Lodl —

Preparing the Next Generation for Continued Community Vitality



Nathan Conner

INQUIRY-BASED LEARNING TEACHES NEBRASKA YOUTH CRITICAL SKILLS: Putting Learning into the Hands of the Students

Interview with Nathan Conner
by Taylor Nuss

Teaching the students of Nebraska to think critically is one of the most valuable skills that will advance the state forward.

Implementing critical thinking skills through inquiry-based learning puts schooling into the hands of the students, which is a successful teaching tool to advance student knowledge, said Nathan Conner, associate professor in the Department of Agricultural Leadership, Education, and Communication at the University of Nebraska-Lincoln.

Conner said students who explore topics and create personal connections for themselves have a positive outlook on learning and incorporate these skills into a career in the future. These skills are important for understanding human relations, adapting new applications, and overall becoming more knowledgeable.

Equally important, employers across the state expect their workforce to examine situations and

make justified decisions. Inquiry-based learning teaches life skills that strengthen the ability to improvise in time-sensitive situations.

INQUIRY-BASED LEARNING TECHNIQUES

Conner said inquiry-based learning approach highlights the student's roles in the learning process by motivating him or her to actively explore and discuss ideas, rather than memorizing facts and passively listening to lectures.

"Inquiry-based learning is a teaching method that can be very hands-on and allows for a thought process that follows scientific inquiry," Conner said. "The scientific process allows students to form questions, develop a hypothesis, collect data, analyze data, and make a decision from it."

This method follows a systematic approach to finding a solution and is used to conduct experiments and unknowingly solve everyday problems in people's lives, according to Conner.

Students engaged in inquiry-based learning in the classroom are more likely to apply these skills in other areas of their life at home and the community.

“Inquiry-based learning teaches students to use the scientific method on the fly,” Conner said. “These decisions could be consumer-based decisions, work-based decisions, or even voting decisions. Ultimately, we encourage students to support their thoughts with critical analysis.”

Much like the use in various industries, inquiry-based learning teaching methods are used in a variety of subjects with high school or college. For example, Conner said an agricultural classroom had students work in the greenhouse and form questions to develop experiments on different conditions that impacted plant health.

Inquiry-based learning is important because students discover information for themselves, figure out problems, and decide they can fix it. Conner said this sense of ownership will carry into their adult life when they have to figure out problems for themselves in a career or personal endeavor.

SUMMER WORKSHOPS FOR TEACHERS

Education is habitually evolving, and teachers should continually grow alongside the technological advancements.

Conner hosts professional development training to help high school science and agriculture teachers learn how to teach inquiry-based learning. The workshops encourage educators to take what they learn during summer training to their classrooms in schools around the state.

While other workshops of its kind are only a few days or weeks long, Conner’s workshops are a full calendar year.

Conner said teachers come together for one summer and complete the workshop face-to-face. Meetings are then held via a video conferencing platform several times throughout the school year. Once teachers conclude the virtual meetings, they return the following summer to continue and complete the workshop.

The benefit of the workshop is to master teaching techniques, learn new content for the classroom, and form a community of educators that can encourage one another, Conner said.

The teachers that utilize Conner’s professional development resources will add value to their classrooms and ultimately excel student learning experiences and improve the rural communities around Nebraska.

ONLINE OPPORTUNITIES MAKE GLOBAL IMPACTS

Access to professional development opportunities can be difficult for rural high school teachers in Nebraska, Conner said. With the use of technology, online conferencing platforms can provide teachers the opportunity to participate from many miles away.

The future of education is growing wildly dependent of technology as an aid. The video conferencing calls that teachers participate in during the summer training workshops serve a dual purpose. First, the workshops allow educators to grow their professional skills. Second, educators can become proficient in using an online Web conferencing software.

As technology is incorporated into school cultures, students will likely incorporate more online platforms in their learning. The potential of online courses opens up doors for students to connect with people outside of their rural communities and become cultured.

“It is important for our high school youth all over the state of Nebraska to become aware that they are going to be global citizens,” Conner said. “They are going to have the opportunity to interact with people from all over the world and they may even end up working with countries and companies located out of the United States.”

The exposure to people around the globe and different cultures will change student perspectives. The benefit of inquiry-based and online learning is developing more well-rounded individuals who are capable of making informed decisions with consideration to the world around them.

For those interested in participating in the summer workshop program, please email Dr. Conner at nconner2@unl.edu.



KEY TAKEAWAYS

- 1** Inquiry-based learning is a hands-on technique that guides the students to actively explore and discuss ideas, rather than memorize facts and listen passively to lectures.
- 2** Developing critical thinking skills are vital for students to master for a professional career, everyday life decisions, and even personal relationships.
- 3** Inquiry-based learning is not limited to specific industries, it benefits an array of disciplines.
- 4** Summer workshops hosted at the University of Nebraska–Lincoln are a good resource for Nebraska high school teachers to personally develop their skills as educators and put newly-learned techniques into action in their classrooms.
- 5** Online video conferencing platforms will be used as an aid in education which will give students the chance to connect with people all around the globe.



For those interested in participating in the summer workshop program please email Nathan Conner at nconner2@unl.edu.

“ Inquiry-based learning teaches students to use the scientific method on the fly. These decisions could be consumer-based decisions, work-based decisions, or even voting decisions. Ultimately, we encourage students to support their thoughts with critical analysis. ”

— *Nathan Conner* —



Nathan Conner working with high school teachers from across Nebraska during his summer workshop.



Kathleen Lodi

NEBRASKA 4-H DRIVES COMMUNITY YOUTH: Programming to Keep Communities Vibrant

*Interview with Kathleen Lodi
by Haley Ehrke*

Nebraska 4-H provides meaningful learning opportunities to Nebraska youth that impacts the next generation of workers in Nebraska.

“The lifelong skills gained through Nebraska 4-H programming can be applied to any industry and develops youth to give back to their communities as adults,” said Kathleen Lodi, Associate Dean and 4-H Program Administrator at the University of Nebraska-Lincoln.

Nebraska 4-H teaches youth across the state, ages 9-19, how to become successful adults through camps, clubs, school enrichment activities, after school programs, workshops, and clinics.

“Every county in Nebraska offers 4-H,” Lodi said. “In 2019, one in three Nebraska youth were involved in Nebraska 4-H, in 77% of Nebraska counties, that reach was one in two — 51% grew up in a rural area, 49% grew up in an urban area.”

By teaching youth valuable life skills, students develop their passions.

“Student passions might be science, technology, engineering, math, nutrition, or agriculture,” Lodi said. “But our main goal is to help the youth succeed as an adult here in Nebraska, regardless of their interests.”

No matter the focus area, Lodi said Nebraska 4-H helps youth become successful adults. Creative thinking, problem solving, and leadership teach lifelong skills that impact their approach to work life. As such, Nebraska 4-H programming helps to grow communities across the state.

EVENTS FOR ANY INTEREST

Nebraska 4-H provides a wide variety of opportunities, including robotics competitions, presentation competitions, cooking, gardening, and exhibiting livestock.

Many events allow for opportunities to learn about more than just one skill. For example, Lodi said the statewide robotics competition held in February 2020, encouraged a mix of interest areas. The

robotics event also allowed youth to learn the value of hard work and dedication to a lengthy process.

“The statewide robotics competition allowed students to apply skills in science, engineering, and math,” Lodl said. “Students actively began working on their project in the fall for the competition in the winter.”

Beyond events, Nebraska 4-H also hosts camps each summer. These camps offer various career options to youth, such as veterinary science, culinary arts, as well as environmental education. The camps provide an opportunity for youth to learn new skills and meet other youth in Nebraska 4-H across the state.

LEADERS RETURN TO COMMUNITIES

Nebraska 4-H develops students into adults that give back to create a positive cycle in the community.

For example, Lodl said as youth progress through the program, they have the opportunity to also serve as teachers to younger participants. The goal is to create a bond between older and younger members.

Additionally, college students who were former Nebraska 4-H members are invited back to the communities to teach others about their experiences, Lodl said. Keeping alumni involved helps strengthen the connection between the program and the communities. It is not uncommon for Nebraska 4-H youth to become leaders in their home areas.

Consequently, development offered by Nebraska 4-H also provides youth opportunities to become future employees in their home communities.

“Nebraska 4-H youth returning into their communities as leaders creates a pipeline for employers who need the essential skills that we provide,” Lodl said.

Lodl said nearly 97% of Nebraska 4-H members continue to college after high school and many choose to return to their communities after schooling is complete. These youth provide employers with the skills and the workforce they need.

ENCOURAGING ENTREPRENEURSHIP

Nebraska 4-H focuses work on youth leadership and entrepreneurship to help youth gain skills to provide back to the state of Nebraska in the future.

“Not every Nebraska 4-H member has to become an entrepreneur and start his/her own business,” Lodl said. “But many students gain an entrepreneurial spirit and creative thinking skills from their Nebraska 4-H experience.”

The entrepreneurial approach encourages youth to think creatively and give back to the community in new ways.

URBAN AND RURAL 4-H

Nebraska 4-H has opportunities for youth in both rural and urban settings. In urban areas, programming is typically offered in a club setting or through school enrichment programs. In rural areas, the 4-H program is typically offered in community-based learning, where community members volunteer their time as leaders.

Lodl said the same learning curriculum is taught to both urban and rural communities. The only difference is the way the youth may reach the information—whether the setting is a club or community based.

“We encourage all communities to incorporate Nebraska 4-H programming, whether in an urban or rural area,” Lodl said. “We want all interested youth to be involved and have the opportunity to develop into successful adults.”

For more information on Nebraska 4-H or opportunities to volunteer, visit 4h.unl.edu.




4-H STEM mentor working with Nebraska 4-H Youth.



Nebraska 4-H youth learning through technology during the STEM mentoring event.



KEY TAKEAWAYS

- 1** Nebraska 4-H provides a wide variety of opportunities such as the statewide robotics competition, gardening, baking, and showing livestock. This allows youth to develop skills that are needed in Nebraska.
 - 2** Every county in Nebraska has 4-H and one in three youth, aged 9-19, is involved in Nebraska 4-H.
 - 3** Nebraska 4-H serves as the engagement piece to youth.
 - 4** 97% of Nebraska 4-H youth continue higher education after high school and many of those return to their communities upon graduation.
 - 5** Nebraska 4-H allows for youth to engage in a variety of skills such as problem-solving, creative thinking, and entrepreneurship which help them return to Nebraska's workforce in the future.
-  For more information on Nebraska 4-H or opportunities to volunteer, visit 4h.unl.edu.

“ Not every Nebraska 4-H member has to become an entrepreneur and start their own business. But many students gain an entrepreneurial spirit and creative thinking skills from their Nebraska 4-H experience. ”

— Kathleen Lodl —



“ The Food Processing Center at the University of Nebraska-Lincoln provides a resource that helps new businesses grow, or existing businesses thrive and expand, which creates successful businesses in Nebraska and generates more revenue within state borders. ”

— Terry Howell —

Diversification in Manufacturing & Food Processing



Terry Howell

NEBRASKA'S ECONOMY IS FUELED BY FOOD: The Role of the Food Processing Center

*Interview with Terry Howell
by Alice Akers*

The Food Processing Center at the University of Nebraska–Lincoln offers professional development services, workshops, and expert guidance for food companies across the state of Nebraska.

“The main purpose of The Food Processing Center is to advance the food industry,” said Terry Howell, executive director of The Food Processing Center. “It is the people’s doorway to food production in Nebraska and we exist to serve as a resource for people in this state.”

Established in 1983, the center serves as a consultancy for people who want information or require services pertaining to the food industry. Specifically, Howell said the center offers expertise in the processing, production, and preservation of food. This is especially helpful for those who want to get into, or those who are already profiting from, the food business.

The center benefits the state of Nebraska as it supports food businesses by sharing food testing and formula development expertise. Specifically, Howell said companies and entrepreneurs can use

the center to test food products and formulations before going into mass production.

Ultimately, the center provides a resource that can help new businesses grow, or existing businesses thrive and expand, in the food industry. This helps create successful businesses in Nebraska, which generates more revenue within state borders.

THE NATIONAL FOOD ENTREPRENEUR PROGRAM

The National Food Entrepreneur Program offered through The Food Processing Center is dedicated to assisting emergent food industry entrepreneurs.

The National Food Entrepreneur Program is a two-part program consisting of the *Recipe to Reality* seminar and the *Product to Profit* service.

Howell said the *Recipe to Reality* seminar is a one-day seminar where entrepreneurs learn the fundamentals of starting a food business. Participants learn of challenges that one might encounter when starting a food business and whether a food business is a realistic choice.

The *Product to Profit* program is for participants wanting to launch their own food business. Howell said this service includes experts who tailor comprehensive assistance to the entrepreneur's business venture. This assistance includes business development, product and process development, label and packaging development, regulatory compliance, product pricing, processing facility location, promotional tools, and strategy.

"If we can help Nebraska-based businesses get off the ground and reach their next goals, building the economy within the state, we feel like we are doing our job well," Howell said.

For more information regarding the National Food Entrepreneur Program, visit fpc.unl.edu/nfep.

PROFESSIONAL DEVELOPMENT AT THE FOOD PROCESSING CENTER

With a better educated workforce, the food industry can thrive, thus raising revenue across the state. For people interested in working in the food industry, The Food Processing Center also offers a number of professional development services.

Food Processing Management Online Certificate Program

This program focuses on advancing productivity, efficiency, or overall performance. Howell said the "Food Processing Management Certificate" is a non-academic program designed for those working in many roles in the food industry, seeking to gain specialized knowledge in food processing management. It is ideal for people without a background in food science to help close the gaps in their knowledge.

Extrusion Workshop

The Extrusion Workshop is a hands-on, introductory-level learning opportunity. Experts from within the FPC and from external companies provide an overview of the science, and then participants learn by operating the equipment in the pilot plant and evaluating its products. Howell said this workshop attracts people from all over the world because it is a critical technology to food processing and Nebraska is one of the few places that has a pilot-scale extruder.

HACCP Workshop

This workshop explores the seven principles of the Hazard Analysis and Critical Control Points (HACCP) system. Howell said this course is a preventive approach to foodborne hazards and the training is meant for poultry processors, food processors, and food service operators. Upon completion of the course, all participants earn a certificate with the official seal of International HACCP Alliance.

The services by FPC staff and faculty, along with the workshops, provide Nebraskans and others in the region with tools to grow their businesses.

"The more that the center can be used to help transform the value of agricultural products grown within the state borders, the better and the more useful the center becomes," Howell said.

For more information on the variety of professional development services provided by The Food Processing Center, visit fpc.unl.edu/professional_development.

STUDENTS GAIN AT THE FOOD PROCESSING CENTER

The Food Processing Center also plays a role in educating students, who will continue to build, engineer, and revitalize Nebraska's economy.

Howell said students can partake in experiential learning with the center, such as assisting staff members with projects requested by its client food companies, to receive hands-on learning.

The UNL dairy plant is one source of those opportunities. The plant produces ice cream and cheese sold on campus at the UNL Dairy Store. Student workers are able to experience almost every aspect of food processing by working at the dairy plant: production, quality control, food safety practices, sanitation practices, and even occasional product development when new flavors are needed or are improved.

The FPC employs about a dozen students per semester to work in these experiential learning roles. In addition to the dairy plant, students work in the pilot plant assisting in product testing, product development assisting in projects for client companies, and in the sensory lab to help run tests for clients.

Students are cross-trained in the various areas and given the opportunity to explore what they are passionate about in food science.

“When students graduate, they will be highly prepared and ready to enter the workforce for the food industry,” Howell said.

For more information on student opportunities, visit fpc.unl.edu/fpc-student-workers.

“ The more that the center can be used to help transform the value of agricultural products grown within the state borders, the better and the more useful the center becomes. ”

— Terry Howell —



Training workshops at the Food Processing Center typically include a tour of the facility.



KEY TAKEAWAYS

- 1 The Food Processing Center serves as a consultancy for people who want information or require services pertaining to the food industry.
 - 2 The center helps build food businesses by providing an outlet where people can gain knowledge and receive assistance.
 - 3 The National Food Entrepreneur Program, offered through The Food Processing Center, is dedicated to helping emerging food industry entrepreneurs through a two-stage certification process.
 - 4 The center offers professional development services such as food processing management, the extrusion workshop, and HACCP workshops.
 - 5 The center also provides experiential learning for current students, where they have hands-on learning in a production environment (UNL dairy plant) or R&D environment (pilot plant and product development services).
-  To learn more about opportunities with the Food Processing Center, visit fpc.unl.edu.



Matt Allmand

NEBRASKA'S MANUFACTURING EXTENSION PARTNERSHIP: Assisting Small-to-Medium Manufacturers to Grow and Enhance Business

*Interview with Matt Allmand
by Demi Striglos*

The Nebraska Manufacturing Extension Partnership (MEP) is a resource provided by the university for manufacturing companies in Nebraska to grow a competitive advantage, increase productivity, develop leadership, and improve technological performance.

“The Nebraska MEP offers expertise through customized workshops, training programs, industry events, and consulting,” said Matt Allmand, director of the Nebraska Manufacturing Extension Partnership at the University of Nebraska-Lincoln.

A manufacturer with a competitive advantage adds an economic advantage to the state as it brings jobs and income to communities.

MANUFACTURING EXTENSION PARTNERSHIP SERVICES

The MEP largely works with small-to-medium manufacturers and offers a free one-hour *Competitive Assessment Review* for any interested manufacturer.

Allmand said this complimentary assessment reviews the given answers and provides manufacturers insight compared with over 3,500 others who have also taken the assessment. The assessment covers four main categories: organization, workforce, systems, and sustainability which serves as a planning starting point.

Beyond the initial assessment, the MEP also provides supervisor trainings, lean manufacturing trainings, International Organization for Standardization (ISO) certification, and, in partnership with the university's Food Processing Center, several food safety trainings.

“The common thread through all of our offerings is a focus on strategy and culture to try and help manufacturers build a foundation that helps them be successful for a long time,” Allmand said.

Allmand said when companies build a strong foundation from opportunities offered by the MEP, they have the ability to impact not only their employees and communities, but also business relationships and partnerships.

A certification from the MEP can be the boost a company needs to be noticed in their sector. Lean manufacturing training and consulting are two ways to provide this boost.

Lean Manufacturing Training

Lean manufacturing is one training option offered at the MEP.

Allmand said Lean manufacturing is a globally successful business approach that emphasizes lowering the amount of waste in manufacturing organizations, while simultaneously maximizing the productivity and lowering risk.

Lean manufacturing is tested and has origins in the *Training Within Industry Services* created by the United States government, according to Allmand.

“Lean manufacturing puts value on every employee,” Allmand said. “It engages the whole team to look at the processes.”

For example, Allmand said a line-worker’s job is not just to build light towers. Instead, the job is to build the light towers every day, better than the day before.

Lean manufacturing focuses on continuous improvement with a high level of respect for every employee in the organization. Much of this training through the MEP is open to individuals in Nebraska, not just companies.

“We invite anyone in the state to complete the training with employees from other companies,” Allmand said.

By doing so, the MEP promotes a sense of community, not only within a company, but also among all companies within an industry to promote a stronger public together.

MEP Consulting for Manufacturers

The MEP also provides consulting to all interested manufacturers, Allmand said.

In this instance, a specialist with the MEP travels to a manufacturer to accomplish a specific goal. This might include working with manufacturers to develop a company strategy or deployment plan.

Allmand said the MEP helps companies grow in a way that they can represent themselves as highly qualified by having an ISO certification and/or other similar certifications.

Manufacturers can not only represent themselves as competitive, but also help the state of Nebraska stay competitive.

COMMUNITY CONNECTIONS

When a company is successful and competitive in their sector, they have the ability to share that success with their community. Many times, a manufacturing company is a rock for a community, providing steady jobs and opportunities to grow professionally.

Allmand said these companies are often sponsors for baseball teams, FFA chapters, and are the ones who donate to community engagement and charitable organizations. This is particularly true for rural Nebraska communities.

Ultimately, the goal of the MEP is to help manufacturers thrive and build communities. The group provides a supportive impact on the lives of all Nebraskans, as services are available statewide.

“The MEP acknowledges the value manufacturers play in rural communities, specifically in an agriculture-based economy,” Allmand said. “While the primary driver in most of the small towns might be agriculture, there is usually a manufacturer on the outside of town that also provides valuable jobs and input into the community.”

CONNECTING WITH THE MEP

Find contacts and more information on the MEP, including schedules for industry trainings open to the public, at nemep.unl.edu.

The MEP also has Twitter and Facebook accounts both found under the name @MEPNebraska.

“ The common thread through all of our offerings is a focus on strategy and culture to try and help manufacturers build a foundation that helps them be successful for a long time. ”

— *Matt Allmand* —



Training with the Nebraska Manufacturing Extension Partnership is hands-on and helps business owners develop a competitive advantage.



KEY TAKEAWAYS

- 1 The MEP offers services to small-to-medium sized Nebraska manufacturers to advance their business.
- 2 The MEP offers a free Competitive Assessment Review for interested groups to get started.
- 3 The primary MEP focus is on strategy and culture to try and help manufacturers build a foundation that helps them be successful.
- 4 Lean manufacturing training and consulting are two options provided by the MEP.
- 5 The MEP acknowledges the impact manufacturers have on rural Nebraska and want to help them improve their business to grow communities.



Find more information on the MEP, including schedules for industry trainings open to the public, at nemep.unl.edu. Also find the MEP on Twitter and Facebook: @MEPNebraska.



“ The Industrial Agricultural Products Center at the University of Nebraska-Lincoln takes unused agricultural materials and processes them to make products of higher value than the original crops. ”

— Mark Wilkins —

Transforming Raw Materials into Value-Added Products



Ed Cahoon

ADDING VALUE TO NEBRASKA COMMODITY CROPS: Using Biotechnology to Advance Production

*Interview with Ed Cahoon
by Matthew Morton*

Farmers in the United States need stability in the markets and larger profit margins when it comes to pricing commodities.

“One way to potentially increase profits for farmers and develop new rural industries is finding value in typical Nebraska commodities, such as soybeans and sorghum, by introducing high-value traits,” said Ed Cahoon, director of the Center for Plant Science Innovation at the University of Nebraska–Lincoln.

Adding value to these commodities provides additional financial opportunities for farmers. For instance, Cahoon said keeping this money with farmers, co-ops, and other local agricultural businesses allows for more money to stay within the community, boosting economic growth and stability in rural Nebraska.

Cahoon works to increase demand and new market opportunities for locally grown commodities such as sorghum and soybeans by applying biotechnology

to add value to crops such as biofuels, bio-jet fuels, aquaculture, and nutritional products.

SORGHUM FOR BIOFUELS

Using sorghum for bio-fuel would likely increase profit margins for farmers and allow for an economically viable energy production through production plants within rural Nebraska.

Unlike soybean seeds, sorghum leaves do not hold oil, Cahoon said. Instead, the stalks of the sorghum plant store lignin and cellulose, which help produce ethanol. Cahoon and his team are working to introduce the capacity of sorghum leaves to produce oil as a co-product. These components of the plant are hydrophobic, meaning they do not mix with water, and can be extracted with hexane (a hydrocarbon) for easy separation from the lignocellulosic fraction. Doing so creates a demand for two separate entities of the sorghum crop and, ultimately, increases profit for the producer.

CAMELINA AND SOYBEANS FOR BIO-JET FUELS

Through biotechnology, Cahoon and his team are working to make carbon chains used in the production of bio-jet fuels in the emerging bio-fuel crop camelina. Cahoon said specific chain lengths of carbon allow camelina seed oil to be converted into a kerosene-type fuel that is similar to current petroleum-derived jet fuel. Doing so reduces greenhouse gas emissions made through the public transportation of flight. The technology that is being developed in camelina can be transferred to soybeans to generate additional market opportunities.

“Commercial aviation accounts for 5% of the global greenhouse gas emissions,” Cahoon said. “There are estimates that say if nothing is done by 2050, that percentage will double.”

Instead, Cahoon hopes to cut this percentage in half through implementing biofuels into commercial aviation.

By implementing this technology, the process of creating and using the bio-jet fuel becomes more attractive because of its ability to reduce the carbon footprint of air travel.

SOYBEANS IN AQUACULTURE

With the ever-growing demand for fish for healthy diets, aquaculture is becoming more prevalent and soybeans are a valuable protein source used to feed both livestock and fish. Cahoon finds ways to make soybeans more suitable for the oil component of aquaculture feed.

Take salmon for example. Cahoon has engineered soybeans to make the red astaxanthin pigment, one of the most costly portions of farm-raised salmon feed. By transferring genes that are naturally expressed in the red flowers of Adonis, his team has developed a red soybean oil that can be fed to salmon to make their flesh have a more appealing color.

“Salmon cannot make the astaxanthin pigment, but instead get it from their diets. The consumer wants the color of salmon flesh to be red and our astaxanthin-rich soybean oil helps deliver this quality,” Cahoon said.

Cahoon’s lab is also working to introduce genes to soybeans to make heart-healthy fish oil-type fatty acids that are another part of aquaculture feed rations. This research is expected to lead to higher premiums and new markets in the aquaculture industry for Nebraska soybean farmers.

SOYBEANS FOR VITAMINS AND ANTIOXIDANTS

Cahoon also sees the demand for renewable products in vitamins and cosmetics consumed daily. Soybean oil is a rich source of vitamin E that is not only an essential nutrient but also an important antioxidant for food processing and cosmetics. With these being such fast-growing markets, Cahoon sees a growing demand for these products.

“Soybeans are already a good source of vitamin E, which comprises one of the world’s biggest nutraceutical markets,” Cahoon said.

Cahoon and his team are actively finding new ways to develop soybeans with increased content and higher-value forms of vitamin E antioxidants.

For more information on other projects happening in the Center for Plant Science Innovation, please visit unl.edu/psi.



KEY TAKEAWAYS

- 1 Cahoon wants to create a world to ensure that there is a constant demand for the crops grown in Nebraska.
- 2 Adding value to Nebraska commodities provides additional financial opportunities for farmers.
- 3 Cahoon works to increase demand for locally grown commodities, such as sorghum and soybeans, to create new ways to add value to crops.
- 4 The research being done with biofuels is aimed to reduce the amount of greenhouse gasses being emitted through flight and ground travel.
- 5 Finding new ways to add value to the commodities grown in Nebraska through the ideas of cosmetics, vitamins and aquaculture will keep driving demand for these products.



For more information on other projects happening in the Center for Plant Science Innovation, please visit unl.edu/psi.

“ One way to potentially increase profits for farmers and develop new rural industries is finding value in typical Nebraska commodities, such as soybeans and sorghum, by introducing high-value traits. ”

— *Ed Cahoon* —



Plants grown in the Center for Plant Science Innovation on the University of Nebraska-Lincoln campus.



Mark Wilkins

INDUSTRIAL AGRICULTURAL PRODUCTS CENTER LEADS VALUE-ADDED AGRICULTURE: Researching and Developing New Products from Crops

*Interview with Mark Wilkins
by Demi Striglos*

The Industrial Agricultural Products Center (IAPC) at the University of Nebraska–Lincoln offers research and technology opportunities to develop and advance new products from previously unused agricultural materials.

“The IAPC takes unused agricultural materials and processes them to make products of higher value than the original crops,” said Mark Wilkins, director of the IAPC at the university.

Projects within the IAPC stem from inquiries and ideas brought to them by businesses or individuals, as well as ideas from IAPC staff and faculty. Farmers, entrepreneurs, and consumers across Nebraska stand to benefit from the IAPC approach to value-added agriculture.

“IAPC works with companies or individuals that have an idea, but limited means to execute the idea,” Wilkins said. “Through the partnership, we create something that benefits the people of the state, as well as the economy.”

HELPING NEBRASKA’S ECONOMY

The overarching goal of IAPC is to boost Nebraska’s economy by increasing the utilization of locally grown agriculture, such as corn, soybeans, and other local crops. One way to do this is to bring additional processing plants into the state.

Wilkins said many Nebraska crops are processed outside the state, which means that little production value is kept in the state. As such, the IAPC hopes to bring processing back to the Nebraska.

“We hope to capture the value of the crops grown in the state of Nebraska by helping entrepreneurs, companies, and others develop new products and processes,” Wilkins said. “However, we recognize that processing plants are currently limited.”

Wilkins hopes companies will add more plants as needs increase. Additionally, processing products within the state would create additional job opportunities, particularly in rural regions.

For instance, facilities have the potential to create manufacturing jobs for local, rural residents. This, coupled with using parts of Nebraska crops that were not previously being used, puts money back into local economies.

Creating processing centers, however, comes with important logistics to consider.

For instance, to reduce costs, manufacturing plants need processing facilities close to the fields where the crops are produced to lessen fuel and transportation costs. Wilkins said that creation of the processing plants should be strategic, accompanied with long-term goals. The IAPC helps companies work through these issues.

CURRENT IAPC PROJECTS

The IAPC has specific projects aimed at Nebraska's economy. Breaking down and using corn fiber and establishing rural biorefineries in Nebraska are two examples of current projects.

Corn Fiber

Corn fiber is a part of the corn kernel that is currently used for cattle feed. When the fiber is broken down, there are several possibilities for creating sustainable consumer goods.

Wilkins said IAPC experts break down the corn fiber, consisting of chains of sugars, into individual sugars. One produced product, succinic acid, is versatile and can be used in both the food industry and plastics.

"Corn fiber does not generate any economic value," Wilkins said. "However, there are other ways to use that portion of corn to add significant value for producers and processors."

Rural Biorefineries

Biorefineries are similar to oil refineries, but they use raw bio-based materials typically found in rural areas in Nebraska. The IAPC conducts research on rural biorefineries to assure that the goal of implementing them in rural Nebraska communities is fruitful.

Wilkins said a biorefinery has the ability to capture all of the value in a single kernel of corn.

"One example of a biorefinery is making ethanol from the starch and plastic from corn fiber," Wilkins said. "Additionally, the oil can be taken out and used for animal feed or the protein can be used to make industrial products."

Bio-based product research supports a concept of biorefineries operating in and growing rural communities and their economies.

THE IAPC FOR THE NEBRASKAN

The IAPC provides the opportunity to expand the crop value for a farmer as well as create prospects for entrepreneurs. Outside funding sources are available and the IAPC helps advise clients in the funding process.

Wilkins said the IAPC is ready to supply the experts and equipment needed to put an idea into action, especially for those unable to carry out ideas on their own.

For more information on the IAPC, visit agproducts.unl.edu/.

“ IAPC works with companies or individuals that have an idea, but limited means to execute the idea. Through the partnership, we create something that benefits the people of the state, as well as the economy. ”

— *Mark Wilkins* —



Mark Wilkins works in his lab to transform raw materials into value-added products.



KEY TAKEAWAYS

- 1** The Industrial Agricultural Products Center offers research and technology opportunities to develop and advance new products from previously unused agricultural materials.
- 2** Farmers, entrepreneurs, and consumers across Nebraska stand to benefit from the IAPC approach to value-added agriculture.
- 3** Processing plants are needed to meet a growing need of value-added agriculture. These plants will add jobs to rural areas.
- 4** Using corn fibers in new ways and establishing rural biorefineries in Nebraska are two current IAPC projects.
- 5** The IAPC is ready to supply the experts and equipment needed to put an idea into action, especially for those unable to carry them out on their own.



For more information on the IAPC, visit agproducts.unl.edu.

“ Building strong communities through Nebraska Extension programming and faculty research help Nebraskans build and retain a strong, stable economy. ”

— *Marilyn Schlake* —





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