

2016 University of Nebraska Combined Research and Extension Plan of Work

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I. Plan Overview

1. Brief Summary about Plan Of Work

The Institute of Agriculture and Natural Resources (IANR) is a part of the University of Nebraska-Lincoln and includes the divisions of teaching, research, and extension. Strategic planning is integral to IANR's function as a land grant institution and it prides itself on working as an integrated system across the three mission areas. To ensure that IANR's priorities reflect the needs of the state's residents there is on-going two-way dialogue between the IANR and the residents of the state. In 2011 strategic two-way dialogue moved to a new, higher plane as Vision for 2025 was implemented. This visioning process was created to determine how IANR will contribute to the critical need of doubling the world's food supply in order to feed nine billion people; address the shifting climate and environmental conditions; respond to the increasing need for energy sources; and consider how to help increase economic income opportunities for communities. In Nebraska one in three jobs is directly tied to agriculture or agribusiness and the state strives to increase job opportunities in this field of expertise. As a result of the visioning process, the priorities of IANR became food, fuel, water, landscapes, and people.

The future of Rural Communities is a crosscutting thread in each of these five issue areas. The importance was highlighted in 2013 by the establishment of a University of Nebraska system-wide initiative, the Rural Futures Institute (RFI), and the hiring of its Executive Director and support staff. UNL Extension also established a new community-focused faculty team called the Community Vitality Initiative for the purpose of partnering with RFI and Nebraska communities.

The Vision for 2025 will be a guide for IANR for the next decade. Engagement with Nebraska government leaders, stakeholders, representatives of organizations, faculty and students/youth will continue. Periodically, listening sessions, surveys, departmental reviews, and input from advisory groups will maintain public involvement.

These priority outcomes of food, fuel, water, landscapes, and people are representative of the societal challenge areas of NIFA. For example, in the Nebraska planning process "food" represents the continuum of food to fork, which includes production, food security and hunger, childhood obesity, nutrition and food safety, and science/food literacy. **Food Production/Security and Landscapes** represents the productivity and sustainability of all of our natural resources. Water is highlighted because of the importance of water to our agricultural and natural resource systems in Nebraska. **People and Their Well-Being** represents the well-being of children, youth, and families as they interact with their environments.

The Institute of Agriculture and Natural Resources will continue to strive to meet the needs of its Nebraska citizens through engagement in internationally-recognized science and education. This mission will be met by: advancing knowledge along a continuum from fundamental research to application; delivering education that addresses the current and emerging needs of the state residents; and teaching tomorrow's professionals through formal and nonformal learning settings. The ongoing cultivation of public-private partnerships will help make our mission more achievable.

The importance of integrated missions will be evident in the continued upward trajectory of

grant/contract dollars received, the rigor/impact of educational programs delivered in both formal and nonformal settings, and in the placement of graduates in careers.

Estimated Number of Professional FTEs/SYs total in the State.

Year	Extension		Research	
	1862	1890	1862	1890
2016	228.0	0.0	140.0	0.0
2017	228.0	0.0	140.0	0.0
2018	228.0	0.0	140.0	0.0
2019	228.0	0.0	140.0	0.0
2020	228.0	0.0	140.0	0.0

II. Merit Review Process

1. The Merit Review Process that will be Employed during the 5-Year POW Cycle

- Internal University Panel
- External Non-University Panel
- Combined External and Internal University Panel
- Combined External and Internal University External Non-University Panel

2. Brief Explanation

The extension work groups within each focus area (beef systems; 4-H youth development; the learning child; community vitality initiative; innovative cropping and water systems; food, nutrition and health; and community environment) update their plans annually using stakeholder input and evaluation results from delivered programs. Also, every faculty member with a research appointment in the Agricultural Research Division (ARD) has a current approved peer-reviewed project that defines his or her area of research investigation. The peer review process for research projects includes the Unit and (if applicable) Research and Extension Center head, at least two faculty members with relevant expertise, and an Associate Dean of ARD. Following review and acceptable revision (if necessary), the project outline is forwarded to USDA-NIFA for inclusion in the REEport database.

Another review process, which combines merit and peer review, is the annual review by state commodity check-off boards of more than 100 research and extension proposals. Proposals selected for funding address the most significant problems facing the producer members and clearly communicate the research's relevance to user needs.

Academic units (subject matter departments and research & extension centers) complete a comprehensive five-year review to ensure program quality and relevance. Teams of three to six external panel members and two or three faculty panel members from other academic units conduct these reviews. The review team assesses the work of the academic unit to ensure that programmatic efforts and research focus on Nebraska's most critical needs. The review team

completes its assessment by the development of a report that helps the administrative unit focus its work for the next five years. It is the responsibility of the IANR Deans to assist the unit administrator and faculty to accomplish the goals identified by the unit, as a follow-up to the review process.

Stakeholder input will remain key to IANR success throughout the process mentioned above.

III. Evaluation of Multis & Joint Activities

1. How will the planned programs address the critical issues of strategic importance, including those identified by the stakeholders?

Ongoing input from stakeholder groups, e.g, advocacy, advisory, and commodity groups, keeps extension action team plans current. Ongoing relationships with stakeholder groups such as the Agriculture Builders of Nebraska and Family, Youth and Community Partners, along with listening sessions led by IANR personnel, and Extension Board reviews of local and regional program, ensures that critical needs are addressed. Continuous listening processes ensure that the plan of work is reviewed and updated regularly. The accuracy of the action plans is verified using the following methods:

- Extension teams meet quarterly to assess their goals and progress made toward achieving them. Teams include both faculty of academic departments who understand long-term trends and faculty located in Extension offices who see, on a daily basis, the needs of Nebraska residents. Many of these faculty members of academic departments have joint research and extension appointments and can represent fundamental as well as applied research and extension education plans.
- Many action teams use monthly phone and/or video conferencing to stay on track.
- Action team leaders talk with subject-matter department administrators annually to ensure that the action team's goals are congruent with university department research and extension goals.
- Action teams meet with their stakeholders and use the input to determine future plans.
- Action teams refine programs to be delivered to ensure that content goals support needs identified by stakeholders and demographic trends.
- ARD faculty currently participating in multi-state projects receive research funding through the multi-state research component of the federal formula funds. These projects are selected and approved by regional director associations because they are high priority needs identified for multi-state activity.
- ARD internal competitive grant funding includes external stakeholder review.

2. How will the planned programs address the needs of under-served and under-represented populations of the State(s)?

Below are examples of how research and extension address the needs of underserved and underrepresented populations.

- ARD research programs related to human nutrition and healthy lifestyles were highlighted under the federal goals and key themes. The research results feed science-based information directly into UNL Extension programs that target underserved and underrepresented populations. ARD is initiating partnerships with Nebraska Indian Community College (NICC) and Little Priest Tribal College for preserving nature, cultural practices, and maize varieties.
- ARD is in the beginning stages of developing an external advisory committee which will include multi-cultural membership.
- Nebraska Extension has built a strong partnership with Little Priest and NICC.

Through this partnership, Native American teens have become more involved in outside activities and interact with youth and adults outside their schools. Program leaders say teens are more motivated and more interested in learning about activities. The Expanded Food and Nutrition Program and the Food Stamp Nutrition Education Program annually teach low resource families and youth (many are from the underrepresented populations) how to make nutritionally sound food choices, use their food dollars wisely, and cook meals for their families that adhere to food safety principles.

- The College of Education and Human Sciences, Extension and the Nebraska Department of Education have undertaken a programmatic effort with targeted school districts to address needs of first generation families.

- An Extension educator addresses the needs of Hispanic and Native American youth in Scotts Bluff County. This program engages middle and high school youth in after-school and community-based programs. Coalitions of Hispanic and Native American individuals contribute to the success of this youth program. In 2013, a second extension educator was hired in northeast Nebraska for the purpose of connecting UNL Extension youth development programs with Hispanic and Native American families in this region.

- Ongoing efforts are in place to recruit and retain a more diverse pool of faculty that can serve as a gateway into underserved and underrepresented populations.

- In 2013, IANR participated in a Civil Rights Review through USDA NIFA and has developed or started several new initiatives to improve connections with underserved audiences. One direct outcome is a \$100,000 Extension-funded competitive grant program for proposals that reach new audiences. A summary of our commitment to a diverse faculty and diversity of audiences reached by our education programs is found at: <http://ianr.unl.edu/diversity>.

3. How will the planned programs describe the expected outcomes and impacts?

Goals and anticipated outcomes guide Extension educational programs. Plan of work goals include output and outcome indicators as well as proposed impacts that will be used as planning tools (see <http://www.extension.unl.edu/progfocus> for work goals to help faculty/staff align outcomes/indicators.) Action teams refine evaluation indicators and survey questions so that data collected by action teams represents statewide program impact. Teams are collecting data through team-led evaluation plans/tools.

The basic and applied sciences that drive ARD research programs are closely aligned with extension outcomes and impacts. Knowledge creation and future workforce education (of graduate students), another essential outcome and impact associated with research, is measured in journal article research, improved technologies, improved germplasm, and numbers of graduating agricultural and life-science scientists. Much of the newly developed knowledge, in both the short- and long-term, helps inform our Extension programming.

4. How will the planned programs result in improved program effectiveness and/or

Documentation of program impacts reinforces UNL Extension and Agricultural Research program effectiveness. The increasing number of multi-action teams, multi-department and multi-state educational programs being delivered in multiple sites using multiple media reflect increased efficiencies in use of content developed. The aggressive efforts of faculty to use electronic media to deliver educational programs helps achieve this efficiency but, more important, allows program clientele to participate in programming on their own time and at their own location. An output of the focused education concept is in the increase in relationships with departments and colleges external to traditional extension partners, e.g., College of Architecture, College of Fine and Performing Arts, Admissions, College of Journalism and Mass Communications, Department of Computer Science and Engineering, the Peter Kiewit Institute for Information Science, Technology, and Engineering, College of Education and

Human Sciences, and College of Engineering. The Eureka! 2015 conference and Engagement Symposium (<http://www.extension.unl.edu/eureka>) are examples of efforts to build these connections.

IV. Stakeholder Input

1. Actions taken to seek stakeholder input that encourages their participation

- Targeted invitation to traditional stakeholder groups
- Targeted invitation to traditional stakeholder individuals
- Survey of traditional stakeholder individuals
- Survey specifically with non-traditional individuals
- Survey of selected individuals from the general public
- Other (Development of public value statements for use by stakeholders to promote IANR programs)

Brief explanation.

UNL Extension and ARD collaborate to plan and develop programs. These two divisions of IANR have worked together to develop an IANR integrated strategic plan for more than 10 years. Listening sessions across the state provide significant input to the strategic planning process. Some of the listening sessions target specific (traditional and nontraditional stakeholder) groups while others are open to general individual stakeholder input. The listening sessions are always conducted in a way to foster input from all participants.

Extension action teams are asked to seek program input from a minimum of five key stakeholders annually (determined to represent a significant population or organization or to be a key leader). This input has been invited by some teams in a formal manner with invitations to specific individuals while other teams use surveys of program stakeholders. In each case the participants are encouraged to provide input for program planning and evaluation.

Most of the UNL academic departments and research and extension centers have advisory committees that represent stakeholder groups. These advisory groups are encouraged to provide input to both extension and research programs. The committees are selected to be representative of the stakeholders served by the unit.

County extension board members carry out one-on-one conversations to ask how well we, as a university entity, are doing to achieve our outcomes. Since these are one-on-one conversations it is easy for participants to respond.

These face-to-face methods are complemented by electronic survey tools and opportunities for online input. In addition, the public can easily give input by sending an e-mail to:

UNLExtension@unl.edu, ardgrants@unl.edu or any of the related departments or programs.

2(A). A brief statement of the process that will be used by the recipient institution to identify individuals and groups stakeholders and to collect input from them

1. Method to identify individuals and groups

- Use Advisory Committees
- Use External Focus Groups

Brief explanation.

Several methods are used to identify individuals and groups to provide input to research and extension programs.

Extension action teams are responsible for identifying stakeholders familiar with the subject matter and related issues impacting state residents.

Unit advisory group participants are identified by administrators and faculty to represent the stakeholders with an interest in the specific unit's research and extension program. The participants typically represent commodity groups, the green industry, related industrial entities, and advisory groups for IANR such as Agriculture Builders of Nebraska and Family, Youth, and Community Partners.

For IANR listening sessions, extension educators are asked to identify key community stakeholders. In addition, for some sessions, general invitations to the public are made to achieve a broader range of input. Some listening sessions target leaders of specific groups to suggest participants.

The 4-H program uses a survey process that involves residents in all 93 counties to garner strategic planning input. This process is augmented by focus groups that collect stakeholder input. In addition, 4-H uses Youth Curriculum Committee members to help identify critical curricula topics.

2(B). A brief statement of the process that will be used by the recipient institution to identify individuals and groups who are stakeholders and to collect input from them

1. Methods for collecting Stakeholder Input

- Meeting with traditional Stakeholder groups
- Meeting with traditional Stakeholder individuals
- Survey of traditional Stakeholder individuals
- Meeting specifically with non-traditional individuals
- Survey specifically with non-traditional individuals
- Meeting with invited selected individuals from the general public

Brief explanation.

The IANR listening sessions are face-to-face meetings with traditional and nontraditional stakeholder individuals. Extension and the Agricultural Research Division representatives listen for input from the stakeholders. Our institution considers itself fortunate that faculty (specialists, educators, and researchers) engage in one-on-one relationships with many of the federal, state, and local agencies in the state, commodity organizations, related industries, educational organizations, and a variety of nonprofit organizations. This engagement provides significant stakeholder feedback.

Extension action teams use a variety of methods to obtain input, including face-to-face meetings, online surveys, and end-of-class surveys of participants during specific program activities. The action teams seek to answer the following questions: Are the action plan's educational goals the highest priorities? Does the action plan represent work that is complementary, but does not duplicate, work of other organizations? Are there potential collaborators for these action plans? Are there educational goals of the action plan that

should be eliminated or handed off to other entities? Meetings with leaders within minority population audiences are held to help identify needs and programs to serve audiences such as Latino and Native American populations.

Extension Board conversations are one-on-one interviews. Questions asked by Extension Board members are: When you think about UNL Extension what are some of the things you value most? When you think of the benefits that UNL Extension brings to the community what comes to mind? What are key programs that we deliver better than anyone else? What are current and/or emerging needs that UNL Extension can address? What new audiences should we be considering?

The Nebraska Rural Poll is sent to approximately 7,000 rural Nebraska residents, with between 2,500 and 3,000 responses received each year for the last 12 years. The poll asks for responses on a variety of rural issues. UNL requires that each administrative unit conduct a program review every five years. In most cases the units conduct some type of stakeholder input process such as surveys, one-on-one interviews, and focus group sessions to gather input for planning future research and education programs. Input from stakeholders for development of the 4-H strategic plan is obtained annually via an interactive website.

3. A statement of how the input will be considered

- In the Budget Process
- To Identify Emerging Issues
- Redirect Extension Programs
- Redirect Research Programs
- In the Staff Hiring Process
- In the Action Plans
- To Set Priorities

Brief explanation.

UNL Extension and the Agricultural Research Division believe that stakeholder input is essential to developing and delivering on-target research and educational programs.

The IANR listening sessions continue to help identify priority issues to consider as we develop research and extension education programs. The listening session engagement provides access to information about trends and issues that impact Nebraskans. Feedback from the listening sessions is provided to departments and extension action teams.

The engagement with minority audience stakeholders is used to help plan and deliver programs that promote cross cultural understanding and to involve teens in local decision making and career planning.

Input from the Nebraska 4-H information gathering process is continually used to refine the Nebraska 4-H strategic plan. Stakeholders identified five target areas for youth development that were used as the basis for the plan. The strategic plan focus is on science, engineering, and technology; citizenship; healthy lifestyles; careers; and ag literacy.

Through stakeholder involvement, research and education programs target the highest

priority needs. Research results are made available to a broad range of stakeholders. Extension education programs are better marketed across the state. Program co-sponsorships become more likely as others learn about programs. Collaborating entities become program participants. Collaborating entities become sources of matching funding for research and education programs.

In addition to the above methods, UNL Extension employees seek urban companies and organizations to partner with on programs of specific interest to Nebraskans. To date, five companies have been involved in discussions on joint sponsorship of educational programs.

V. Planned Program Table of Content

S. No.	PROGRAM NAME
1	Food Production/Security and Landscapes
2	People and their Well-being

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Food Production/Security and Landscapes

2. Brief summary about Planned Program

The **Food Production/Security and Landscapes** program focuses on using basic and applied research in the life/agricultural sciences to generate knowledge critical to maximizing productivity in animal and plant agriculture, engineering, natural resources, climate, and sustainable energy systems. Research efforts will span from the basic/fundamental to the applied, relating to crop and animal systems, bioenergy feedstocks, and the natural landscapes in which those systems exist. Extension programs will continue to transfer new knowledge to producers that will help them optimize productivity while ensuring financial and environmental sustainability of Nebraska's farms and ranches. Undergraduate and graduate education programs will support research and extension efforts, and ensure a highly educated workforce essential to modern agriculture.

3. Program existence : Mature (More than five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	0%		9%	
111	Conservation and Efficient Use of Water	8%		9%	
112	Watershed Protection and Management	4%		5%	
132	Weather and Climate	5%		3%	
133	Pollution Prevention and Mitigation	4%		6%	
136	Conservation of Biological Diversity	0%		3%	
201	Plant Genome, Genetics, and Genetic Mechanisms	0%		8%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	3%		5%	
205	Plant Management Systems	23%		4%	
206	Basic Plant Biology	0%		4%	
211	Insects, Mites, and Other Arthropods Affecting Plants	4%		5%	
212	Diseases and Nematodes Affecting Plants	3%		8%	
213	Weeds Affecting Plants	4%		5%	
301	Reproductive Performance of Animals	1%		3%	
302	Nutrient Utilization in Animals	1%		6%	
305	Animal Physiological Processes	0%		5%	
307	Animal Management Systems	28%		3%	
311	Animal Diseases	2%		5%	
601	Economics of Agricultural Production and Farm Management	9%		1%	
605	Natural Resource and Environmental Economics	1%		3%	
	Total	100%		100%	

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

The **Food Production/Security and Landscapes** program focuses on using basic and applied research in the life/agricultural sciences to generate knowledge critical to maximizing productivity in animal and plant agriculture while simultaneously enhancing Nebraska's biological diversity; mitigating impacts of climate change; ensuring the availability of ecosystem services; and maintaining the sustainability of

Nebraska's natural resources (especially wildlife, grasslands, water, and soil). Extension programs will continue to transfer new knowledge to producers that helps optimize productivity while ensuring financial and environmental sustainability of Nebraska's farms and ranches. Undergraduate and graduate education programs will support research and extension efforts, and ensure a highly educated workforce essential to modern agriculture.

2. Scope of the Program

- Integrated Research and Extension
- Multistate Integrated Research and Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

- We will ensure alignment between research and extension efforts throughout this program of work.
- We will retain current faculty positions, although the focus of some will change.
- New faculty members will have been added in the areas of stress biology, computational sciences, beef systems, High Plains cropping systems, healthy systems for agriculture and natural resources, and drivers of economic vitality.
 - We will see the continued major role of agriculture in the state.
 - We will have financial support from the state, private sector, university, and federal programs that support base programs, although base funding levels will likely decrease.
 - We will be increasingly dependent on funding from donors as well as grants from the federal government, commodity groups, and the private sector to support education, research, and extension efforts.

2. Ultimate goal(s) of this Program

- To increase the productivity, profitability, and sustainability of Nebraska's agricultural enterprises in order to sustainably meet world food demands.
- To enhance our landscapes as a natural habitat and ecosystem resource.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2016	152.0	0.0	129.0	0.0
2017	152.0	0.0	129.0	0.0
2018	152.0	0.0	129.0	0.0
2019	152.0	0.0	129.0	0.0
2020	152.0	0.0	129.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

- Conduct foundational research in the basic sciences that underpins and will support future productivity and sustainability advances in agriculture and Nebraska's environmental resources.
- Conduct research and extension programs to develop and deliver new and improved crop and livestock integrated management programs that increase the potential for improved agricultural productivity.
- Conduct research and extension programs to develop and deliver new and improved information to help producers create sustainable crop and livestock production programs.
- Conduct research and extension programs that will help characterize and maintain the High-Plains ecosystem, and better understand the potential impacts of climate variability and change.
- Conduct research and extension programs that help citizens mitigate the impact of water stress (excess and insufficiency).

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> • Education Class • Workshop • One-on-One Intervention • Demonstrations • Other 1 (On-Farm Research) 	<ul style="list-style-type: none"> • Newsletters • TV Media Programs • eXtension web sites • Web sites other than eXtension • Other 1 (UNL Extension "Umbrella" websites) • Other 2 (Mobile apps/interactive pubs)

3. Description of targeted audience

Nebraska farmers and ranchers, along with landowners, are the primary target audience for this work. In addition, target audiences will include land managers, bankers, agricultural consultants and agribusiness professionals who provide products and services to farmers and ranchers. The program's research and education efforts will provide valuable information for state and local policy makers (especially Natural Resource District boards of directors) as they make decisions regarding natural resources and climate issues. The program will provide agency staff with the knowledge they need to carry out agency responsibilities and mandates.

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
 - Direct Adult Contacts
 - Indirect Adult Contacts
 - Direct Youth Contacts
 - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Percentage of Agricultural Research Division HATCH projects in food production/security and landscapes.
- Number of workshops, continuing education programs, Web-based curricula and field days/tours related to food production/security and landscapes.
- Number of new extension publications and other education resources related to food production/security and landscapes.
- Number of new products and decision tools developed and made available to clientele related to food production/security and landscapes.

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	Nebraska farmers will increase productivity and profitability through adoption of research and extension information provided by IANR programs (measured by value placed on the information by clientele).
2	Nebraska farmers and ranchers will have sustainable food and biomass systems through adoption of best management practices (measured by percent of clientele adopting best management practices).
3	Nebraska farmers and ranchers will increase their knowledge and awareness of how integrated pest management and pesticide best management practices can help protect water quality and human health while providing acceptable crop pest protection (measured by the number of farmers and commercial applicators certified in pesticide safety).
4	Nebraska cattle producers will increase profitability and sustainability of range resources and other inputs through adoption of research and extension information provided by IANR programs (measured by value placed on the information by clientele).
5	Consumptive water use by irrigated crops will be reduced. The outcome measure will be the percent reduction of estimated consumptive water use when the current year is compared to the estimated consumptive water use in calendar year 2006. The consumptive water use will be estimated using the irrigation water pumped in Natural Resource Districts that require the use of water measurement devices.
6	Nebraska farmers, ranchers, businesses, and home owners will adopt new practices that will improve water management and protect water quality. This will be measured as the percentage of education program participants who indicate they have adopted or plan to adopt new practices.

Outcome # 1

1. Outcome Target

Nebraska farmers will increase productivity and profitability through adoption of research and extension information provided by IANR programs (measured by value placed on the information by clientele).

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 132 - Weather and Climate
- 133 - Pollution Prevention and Mitigation
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Diseases and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 307 - Animal Management Systems
- 311 - Animal Diseases
- 601 - Economics of Agricultural Production and Farm Management
- 605 - Natural Resource and Environmental Economics

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 2

1. Outcome Target

Nebraska farmers and ranchers will have sustainable food and biomass systems through adoption of best management practices (measured by percent of clientele adopting best management practices).

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships

- 111 - Conservation and Efficient Use of Water
- 132 - Weather and Climate
- 133 - Pollution Prevention and Mitigation
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Diseases and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 307 - Animal Management Systems
- 311 - Animal Diseases
- 601 - Economics of Agricultural Production and Farm Management
- 605 - Natural Resource and Environmental Economics

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 3

1. Outcome Target

Nebraska farmers and ranchers will increase their knowledge and awareness of how integrated pest management and pesticide best management practices can help protect water quality and human health while providing acceptable crop pest protection (measured by the number of farmers and commercial applicators certified in pesticide safety).

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 132 - Weather and Climate
- 133 - Pollution Prevention and Mitigation
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Diseases and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants
- 311 - Animal Diseases

- 601 - Economics of Agricultural Production and Farm Management

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 4

1. Outcome Target

Nebraska cattle producers will increase profitability and sustainability of range resources and other inputs through adoption of research and extension information provided by IANR programs (measured by value placed on the information by clientele).

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 111 - Conservation and Efficient Use of Water
- 213 - Weeds Affecting Plants
- 302 - Nutrient Utilization in Animals
- 307 - Animal Management Systems
- 601 - Economics of Agricultural Production and Farm Management
- 605 - Natural Resource and Environmental Economics

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 5

1. Outcome Target

Consumptive water use by irrigated crops will be reduced. The outcome measure will be the percent reduction of estimated consumptive water use when the current year is compared to the estimated consumptive water use in calendar year 2006. The consumptive water use will be estimated using the irrigation water pumped in Natural Resource Districts that require the use of water measurement devices.

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water

- 132 - Weather and Climate
- 133 - Pollution Prevention and Mitigation
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 605 - Natural Resource and Environmental Economics

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 6

1. Outcome Target

Nebraska farmers, ranchers, businesses, and home owners will adopt new practices that will improve water management and protect water quality. This will be measured as the percentage of education program participants who indicate they have adopted or plan to adopt new practices.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 132 - Weather and Climate
- 133 - Pollution Prevention and Mitigation
- 205 - Plant Management Systems
- 605 - Natural Resource and Environmental Economics

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations

- Competing Public priorities

Description

- Downturn in the state economy could impact outcomes.
- Natural, disease, or human-driven catastrophes would impact outcomes.
- Complete refocus of University of Nebraska program priorities would affect outcomes.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

We will conduct evaluations for the life of this program of work through: multiple listening sessions each year; formal and informal evaluations completed in conjunction with workshops, field days, continuing education workshops, and peer reviews of planned research and extension programs; external peer panels during six-year reviews of unit and issue-based reviews of teaching, research, and extension programs.

Research productivity will be measured against nationwide norms using Academic Analytics.

V(A). Planned Program (Summary)

Program # 2

1. Name of the Planned Program

People and their Well-being

2. Brief summary about Planned Program

What does **People and Their Well-Being** mean? For Nebraskans it means a condition of existence characterized by health, happiness, prosperity, and welfare of people. The **People and Their Well-Being** program focuses on using basic and applied research in the life/agricultural sciences to generate knowledge critical to maximizing productivity in food sciences; biochemical; business/community vitality; entrepreneurship; healthy living; and development and success of young children, youth, and families. Research efforts will span from the basic/fundamental to the applied, relating to nutrition, food safety, families, and communities. Extension programs will continue to transfer to Nebraskans new knowledge that helps optimize productivity and human nutrition while ensuring financial and environmental sustainability of our families and communities. Undergraduate and graduate education programs will support research and extension efforts, and ensure a highly educated workforce essential to Nebraska and its economy.

3. Program existence : Mature (More than five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
201	Plant Genome, Genetics, and Genetic Mechanisms	0%		21%	
204	Plant Product Quality and Utility (Preharvest)	0%		6%	
303	Genetic Improvement of Animals	0%		1%	
308	Improved Animal Products (Before Harvest)	0%		1%	
403	Waste Disposal, Recycling, and Reuse	0%		5%	
501	New and Improved Food Processing Technologies	0%		4%	
502	New and Improved Food Products	0%		9%	
503	Quality Maintenance in Storing and Marketing Food Products	0%		4%	
607	Consumer Economics	0%		2%	
608	Community Resource Planning and Development	15%		1%	
610	Domestic Policy Analysis	0%		5%	
702	Requirements and Function of Nutrients and Other Food Components	0%		13%	
703	Nutrition Education and Behavior	20%		1%	
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources	0%		1%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	0%		4%	
724	Healthy Lifestyle	15%		5%	
802	Human Development and Family Well-Being	0%		12%	
806	Youth Development	50%		5%	
	Total	100%		100%	

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

As many Nebraska rural communities face dwindling population and number of businesses, many youth are compelled to leave rural areas to find employment. The cost of living has been harder to maintain, health care and healthy lifestyles have been affected, and educational resources are sometimes difficult to obtain. To address these concerns, the **People and Their Well-Being** program area will focus

on issues to help young people be successful; ensure children are ready to enter kindergarten; food, nutrition, and well-being; agriculture and related food processing; and will conduct basic and applied research that will improve characterization, reduction, and elimination of food safety hazards from farm to consumer.

Turning ideas into action, 4-H youth are becoming everyday heroes who persevere through challenges to leave lasting, positive impacts on their communities. Through the work of caring mentors, 4-H is cultivating a growing number of America's youth to lead in a Revolution of Responsibility. Their commitment challenges us all to join the movement toward meaningful change. By taking part in the Nebraska 4-H Revolution of Responsibility, youth are preparing for a successful future by focusing on 4-H science, agricultural literacy, career development and college readiness, citizenship and leadership, and healthy living.

Investing in young children benefits us all and The Learning Child (TLC) team enhances the capacity of communities to support the healthy growth, development, and success of young children. When you invest in the quality of care and education young children receive, you are investing in the healthy growth, sustainability, and future of the community.

In Nebraska, over \$498 million dollars are spent annually on obesity-related health care. Obesity and physical inactivity are risk factors for heart disease and stroke, diabetes, and some cancers. In Nebraska, overweight and obesity affect 65 percent of adults and 33 percent of youth. Foodborne illness (including food allergies) creates an enormous social and economic burden on communities and health systems. In the United States, foodborne illnesses pose an estimated \$77 billion economic burden in total annual health-related costs. Creating healthier eating patterns, increasing physical activity levels, improving financial health, and reducing foodborne illness are top priorities to reach the ultimate goal of improving health and reducing social and economic costs for Nebraskans.

Vitality of Nebraska communities was identified as a critical need in 2013, resulting in UNL Extension establishing a new faculty team and focus called Community Vitality Initiative. This team has initiated planning around three primary initiatives: development and growth of rural Nebraska businesses; engagement of youth and young adults in rural communities; and creation of 21st century communities that attract and retain young people.

2. Scope of the Program

- Integrated Research and Extension
- Multistate Integrated Research and Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

- University of Nebraska-Lincoln has faculty resources to address research and extension program needs related to people and their well-being.
- Knowledge change leads to behavior change which leads to condition change.
- Land grant universities can develop and deliver educational programs to help individuals and families make informed decisions.
- We will ensure alignment between research and extension efforts throughout this program of work.
- We will retain current faculty positions, although the focus of some will change.
- New faculty members will be added in the areas of behavioral-based epidemiology, behavioral economics and health disparities, childhood health behaviors, food safety risk assessment, food lipid chemistry and functionality, lipid metabolism and health, and science literacy.
- We will have financial support from the state, private sector, university and federal programs that support

base programs, although base funding levels will likely decrease.

- We will be increasingly dependent on funding from donors as well as grants from the federal government, commodity groups, and the private sector to support education, research and extension efforts.
- Producers, processors, and consumers will need improved knowledge regarding food safety concepts in order to maintain a safe food supply and reduce health risks.
- Producers, processors, and consumers will adopt new practices, if those practices demonstrate effectiveness and economic impact.

2. Ultimate goal(s) of this Program

The overall goal of **People and Their Well-Being**: increase the quality of learning experiences for young children and support their school readiness; increase leadership capacity of youth and adults making positive changes as a result of leadership programs; decrease childhood obesity and the related economic costs by increasing those consuming foods that match MyPyramid food recommendations and physical activity; provide a safe food supply that results in decreased foodborne illness; and promote community vitality.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2016	76.0	0.0	11.0	0.0
2017	76.0	0.0	11.0	0.0
2018	76.0	0.0	11.0	0.0
2019	76.0	0.0	11.0	0.0
2020	76.0	0.0	11.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Basic and applied research will focus on rural and urban family life and lifestyles; human nutrition, with particular emphasis on how foods, our molecular and macro-environments, and food systems interact to impact our well-being; food sciences, including food processing safety, food production waste reduction, and processing technologies to ensure human well-being and nutritious food choices.

Planned program activities include a cascaded approach to creating long-term behavior change. Each program area will include mass-media educational efforts (websites, news articles, general contacts) to reach the general public; 1-2 hour workshops that focus on increasing knowledge; longer-term (4-6 hour) learning experiences that begin to change attitudes and practices; and in-depth training designed to create behavior change that involves multiple contact opportunities over an extended period. By using this approach, a variety of learners are engaged in programming that best fits their needs.

Examples of program activities include:

- Workshops for child care providers to increase their skills in developing social-emotional strengths in young children.
- Web-based learning modules designed to give divorced or separated parents the skills to better interact with their families.
- Campus-based career camps which enable high school students to interact with faculty while exploring post-secondary options.
- Nutrition education workshops to help high risk families make healthy choices on limited budgets.
- Technology-based experiences (using apps, social media, etc.) to help engage users in learning around core topics.
- Workshops for food service providers and post-harvest producers on cutting-edge resources to enhance food safety and quality.

All of these program activities will be purposefully designed to reach targeted outcomes and achieve long-term impact.

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> • Education Class • Workshop • Demonstrations • Other 1 (On-line Programs) 	<ul style="list-style-type: none"> • Newsletters • eXtension web sites • Web sites other than eXtension • Other 1 (Social Media Apps) • Other 2 (UNL Extension "Umbrella" websites)

3. Description of targeted audience

The target audience includes:

- High-risk families
- Children and youth
- Families of young children (young children defined as those 0-8)
- Producers
- Good processing and retail establishment owners/workers
- Consumers,
- Business and community leaders

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
 - Direct Adult Contacts
 - Indirect Adult Contacts
 - Direct Youth Contacts
 - Indirect Youth Contact
 - Number of patents submitted
 - Number of peer reviewed publications
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Number of extension in-depth workshops.
 - Percentage of Agricultural Research Division HATCH projects in nutrition, family health and well-being, food safety, and career development.
 - Number of scholarly publications and curricula related to nutritional sciences and family well-being.
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	Increase adoption of preharvest methods for food quality and safety.
2	Nebraska will have access to higher educated workforce to meet the needs of the 21st century workplace.
3	Youth will increase behaviors that result in healthier lifestyles.

Outcome # 1

1. Outcome Target

Increase adoption of preharvest methods for food quality and safety.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 204 - Plant Product Quality and Utility (Preharvest)
- 308 - Improved Animal Products (Before Harvest)
- 608 - Community Resource Planning and Development
- 703 - Nutrition Education and Behavior
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 2

1. Outcome Target

Nebraska will have access to higher educated workforce to meet the needs of the 21st century workplace.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 608 - Community Resource Planning and Development
- 724 - Healthy Lifestyle
- 802 - Human Development and Family Well-Being
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 3

1. Outcome Target

Youth will increase behaviors that result in healthier lifestyles.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 608 - Community Resource Planning and Development
- 703 - Nutrition Education and Behavior
- 711 - Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
- 724 - Healthy Lifestyle
- 802 - Human Development and Family Well-Being
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities

Description

• A downturn in the state's economy will impact families' access to high-quality, nutritious foods. Budget restrictions that limit the creation of new knowledge or the curtailment of extension education programs would impact outcomes. Public policy changes regarding the support of healthy food choices and the commodities that can help sustain those choices may affect program outcomes.

- Natural, disease, or human-driven catastrophes will affect outcomes.
- Economic constraints may threaten potential new technologies that would increase food safety.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Research and extension faculty will use a range of evaluation strategies written into the programs developed to assess program impact. Indicators of success have been identified for each goal and will be evaluated using the methods indicated above. Research productivity will be measured against nationwide norms using Academic Analytics.