National Outcomes and Indicators for the Formula Grants in the 5-Year State Plan of Work Update and Annual Report of Accomplishments and Results

Planned Program: Childhood Obesity *Report outcomes of programs funded by Hatch, Smith-Lever 3(b and c), Evans-Allen and 1890 Extension. Outcomes of these programs funded by multiple sources may be included, unless they are reported elsewhere (please do not include EFNEP data).*

Outcome #1: ***Children practice healthy eating***

KAs: 703, 704, 724, 806, 701, 702, 501,502

Define Outcome: Children and youth practice healthy eating as defined by the current U.S. Dietary Guidelines for Americans. Recommendations include: A) ***consuming more healthy foods*** such as: vegetables, fruits, whole grains, fat-free or low-fat milk and milk products, seafood, lean meats and poultry, eggs, beans and peas, and nuts and seeds; B) ***consuming less foods/food components that are commonly eaten in excess*** such as: sodium, solid fats, added sugars, and refined grains; and C) ***following healthy eating patterns*** such as: eating breakfast, eating as a family, making healthy snack choices, etc.

List & Define Indicators:

1. Of the _____ total number of children and youth reached,
   a. The number that gained knowledge about eating more of healthy foods _____
   b. The number that reported an intention to eat more of healthy foods _____
   c. The number that reported eating more of healthy foods _____

2. Of the _____ total number of children and youth reached,
   a. The number that gained knowledge about eating less of foods/food components which are commonly eaten in excess _____
   b. The number that reported an intention to eat less of foods/food components which are commonly eaten in excess _____
   c. The number that reported eating less of foods/food components which are commonly eaten in excess _____

3. Of the _____ total number of children and youth reached,
   a. The number that gained knowledge on healthy eating patterns_____
   b. The number that reported an intention to adopt healthy eating patterns _____
   c. The number that reported adopting healthy eating patterns _____

4. Of the _____ total number of families/caregivers reached,
   a. The number that gained knowledge about eating more of healthy foods _____
   b. The number that reported an intention to eat more of healthy foods_____
   c. The number that reported eating more of healthy foods _____

5. Of the _____ total number of families/caregivers reached,
   a. The number that gained knowledge about eating less of foods/food components which are commonly eaten in excess _____
   b. The number that reported an intention to eat less of foods/food components which are commonly eaten in excess_____
   c. The number that reported eating less of foods/food components which are commonly eaten in excess _____

6. Of the _____ total number of families/caregivers reached with programs about healthy eating patterns,
   a. The number that gained knowledge on healthy eating patterns_____

b. The number that reported an intention to adopt healthy eating patterns _____
c. The number that reported adopting healthy eating patterns_____

7. Number of new and improved technologies and processes to enhance the nutritional value and marketability of foods and food products (excluding patents) _____

8. Number of active research projects on the development or adoption of healthy eating guidelines and childhood obesity _____

9. Number of policy changes implemented to support healthy eating guidelines
a. _____community
b. _____state

Please provide one example:

10. Number of environmental changes implemented to support healthy eating guidelines
a. _____ community
b. _____state

Please provide one example:

Outcome #2: ***Children engage in healthy levels of physical activity***

KAs: 703, 724, 806, 804

Define Outcome: Children and youth engage in healthy levels of physical activity as defined by national physical activity guidelines.

List & Define Indicators

1. Of the _____ total number of children and youth reached,
a. The number that understand the benefits of physical activity
b. The number that reported an intention to increase physical activity and/or reduce sedentary time in their daily lives _____
c. The number that reported increasing their physical activity and/or reducing sedentary time_____
d. The number that reported engaging daily in 60 minutes or more of physical activity_____

2. Of the _____ total number of children and youth reached,
a. The number that understand the benefits of spending time together in physical activity_____
b. The number that reported an intention to spend time together in physical activity_____
c. The number that reported spending time together in physical activity_____

3. Of the _____ total number of children and youth reached,
a. The number that understand the importance of balancing food intake and physical activity_____

4. Of the _____ total number of families/caregivers reached
a. The number that understand the benefits of spending time together in physical activity_____
b. The number that reported an intention to spend time together in physical activity_____
c. The number that reported spending time together in physical activity_____

5. Of the _____ total number of families/caregivers reached,
a. The number that understand the importance of balancing food intake and physical activity_____

6. Number of active research projects on the development or adoption of physical activity recommendations and childhood obesity _____

7. Number of policy changes implemented to support physical activity guidelines
   a. _____community
   b. _____state

   Please provide one example

8. Number of environmental changes implemented to support physical activity guidelines
   a. _____community
   b. _____state

   Please provide one example:

Outcome #3: ***Families, children, and youth have access to healthy foods***

Define Outcome: Healthy food is available and affordable in *personally and socially acceptable ways as defined by (cite reference - below)*

KAs: 607, 703, 704

List & Define Indicators:

1. Of the _____ total number of families with children reached,
   a. The number that gained knowledge of how to access/produce/preserve healthy foods_____
   b. The number that reported an intention to access/produce/preserve healthy foods_____
   c. The number that reported supplementing their diets with healthy foods that they produce/preserve/obtain utilizing community/backyard gardens, fishing hunting, etc. _____
   d. The number that reported utilizing delivery systems/access points that offer healthy foods_____

2. Of the _____ total number of stakeholders reached,
   a. The number that reported an intention to make healthy foods more accessible in their communities in personally and socially acceptable ways_____.

   Please include an example if not covered elsewhere in the report

3. Number of existing delivery systems/access points of those reached that expand and/or improve their offering of healthy foods
   a. _____farmers markets
   b. _____produce at corner stores
   c. _____school food programs and other food options (vending machines, school events, etc.)
   d. _____grocery stores
   e. _____other systems/access points, not noted
   f. _____total (if not reported above)

   Please provide one example

4. Number of new delivery systems/access points offering healthy foods
   a. _____farmers markets
   b. _____produce at corner stores
   c. _____school food programs and other food options (vending machines, school events, etc.)
   d. _____grocery stores
   e. _____other systems/access points, not noted

f. _____total (if not reported above)

Please provide one example

5. Number of active research projects on families' ability to access healthy and affordable foods in personal and socially acceptable ways_____

Definitions for direct /indirect contacts:

- Direct – People receiving educational experiences (i.e. a series of lessons or one-time contacts)
- Indirect – The distribution of information and resources including mass communication, public events, and material distribution

Planned Program: Climate Change

Outcome #1: Development of new knowledge and technologies

Define Outcome: Development of new knowledge and new technologies in agricultural and forestry science and the transfer of these to clientele to address the effects of climate variability and change.

List & Define Indicators:

Output Indicators:

1. Number of current year citations of climate related publications _____
2. Number of current year climate relevant educational and programs _____
3. Number of current year climate relevant research programs _____
4. Number of new crop varieties and genotypes with climate adaptive traits _____
5. Number of new animal breeds and genotypes with climate adaptive traits _____
6. Number of new assessment and management tools developed, including models and measurements of greenhouse gas emissions _____
7. Number of climate relevant social media products, web-based products and communication tools (smart phone apps, facebook, twitter) _____
8. Number of new climate relevant databases, monitoring systems, and inventories managed or under development_____

Outcome Indicators:

9. Of the _____ number of program participants, the number that increase knowledge of management practices under climate variability and change _____

Outcome #2: Enhance adaptive capacity to climate change

Define Outcome: Enhance adaptive capacity of production and natural systems to reduce exposure and vulnerability to climate variability and change

List & Define Indicators:

1. Of the _____ number of participants, the number that employ climate adaptation strategies in various production and natural ecosystems, including strategies for biodiversity _____
2. Number of acres under recommended adaptation strategies for production agriculture and natural resources management, including invasive species, pest management, pollutant loads, wetlands _____
3. Of the _____ number of participants, the number that adopted recommended adaptation strategies for production agriculture and natural resources management, including invasive species, pest management, pollutant loads, wetlands _____
4. Number of new genotypes and varieties for climate adaptation in production agriculture and forestry _____
5. Number of acres planted with new recommended genotypes or varieties with climate adaptive traits _____
6. Of the number of participants, the number who planted recommended genotypes or varieties with climate adaptive traits _____
7. Number of agencies/organizations/communities participating in the programs that incorporate climate-based management practices in community development _____
    - (for example: to address future rise in sea level, not building on the flood plain, etc.)

Outcome #3: Improve climate mitigation strategies and their adoption

Define Outcome: Improve mitigation strategies for the reduction of greenhouse gas emissions and increase carbon sequestration in production and natural systems and communities

List & Define Indicators:

1. Of the _____ number of total program participants, the number who adopted recommended climate mitigation practices (in areas such as: water use efficiency, livestock production feeding practices, carbon sequestration, reducing carbon and energy footprint, etc.) _____
2. Number of acres under recommended climate mitigation practices (in areas such as: water use efficiency, livestock production feeding practices, carbon sequestration, reducing carbon and energy footprint, etc.) _____
3. Numbers of agencies/organizations/communities that adopted recommended climate mitigation practices and policies (for example: built bike paths, installed solar panels, applied water conservation policies, etc.)_____

Planned Program: Food Safety

Outcome #1: ***Increase number of viable technologies to improve food safety***

Define Outcome: On national and global scales, increase and improve the number of viable (validated, statistically relevant, economical, environmental and socially acceptable) technologies (to include communication and information technologies, and sampling strategies) for the detection and characterization of food supply foodborne threats. Foodborne threats include microbial pathogens, toxins, chemical contaminants, and biologics (vaccines, allergens, nanoparticles, etc). Develop or increase the number of improved viable prevention, intervention, and control strategies for foodborne threats along the food production continuum and for all food production scales (small, medium and large producers, processors and retail).

List & Define Indicators:

1. Number of viable technologies developed or modified for the detection and characterization of food supply contamination from foodborne threats. (404, 501, 711) _____

2. Number of viable prevention, control and intervention strategies for all food production scales for foodborne threats along the food production continuum. (404, 501, 502, 711, 712) _____

3. Number of individuals who learn about prevention, detection, control and intervention technologies. (400s, 500s, 700s) _____

4. Number of improved prevention, detection, control and intervention technologies adopted. (501, 502, 404, 711, 712) _____

5. Number of reported changes in prevention, detection, control, and intervention strategies. (501, 711, 712) _____

Optional Items: How to Measure Indicators:

1. The number of patents, peer-reviewed manuscripts, and peer-reviewed articles reported. Determine the number of new methods used by commercial and state labs and those reported by AODC, USDA (FSIS), and others such as KSU who keeps a log on rapid detection methods for foodborne pathogens.
2. Survey results collected by Extension and direct information from producers, processors, and retail. Information can also be gathered from local science, Extension, and other groups. Information from the National HAACP alliance, Seafood HAACP alliance, GAPs (Cornell program on Produce Safety), and others.
3. The number of students, producers, food industry employees, and state and commercial lab workers trained to use the technologies. The number of producers trained by Extension initiatives. The number reporting new knowledge in detection, prevention, control and intervention technologies. Information from the National HAACP alliance, Seafood HAACP alliance, GAPs (Cornell program on Produce Safety), and others.
4. Same as #3, above.
5. Same as #3, above.

Outcome #2: ***Reduce incidence of foodborne illness***

Define Outcome: Design strategies and tools to detect and eliminate pathogens and chemical and physical contaminants. Identify processes that enhance safety during production, transportation, preservation/processing, and preparation/handling of food.

List & Define Indicators:

1. Number of foodborne illness cases reported to medical professionals. (712) _____

2. Number of absences reported in schools or workplace. (712, 723) _____

3. Number of food safety regulatory actions including recalls. (711, 712) _____

4. Amount of potential economic losses from reduced productivity, increased medical expenses, and food industry losses. (603, 723) _____

Optional Items: How to measure indicators:

1. Foodnet website, state epidemiologist, secondary data, and CDC.
2. Department of Education, public health agencies, insurance companies.
3. Secondary data, public health agencies, FDA website, FSIS website, and industry food recalls.
4. Food safety news blogs (ex, Bill Marler).

Outcome #3: ***Increase adoption of recommended safe food handling practices at the individual, family, community, production, and supply system levels.***

Define Outcome: Foodborne illness incidence can be reduced when recommended food safety practices are adopted by users all along the food chain. These recommended practices need to be adopted by individuals, families, and communities, as well as producers, processors, and those at the retail levels (restaurants and other vendors). Safe food handling includes using proper time and temperature controls (keeping hot foods hot and cold foods cold including proper thawing).

List & Define Indicators:

1. Number of growers, producers, and food workers completing GAPs, GMPs, HACCP, food safety certification (like ServSafe), and on farm BMP programs to increase food safety. (711, 712, 723) _____

2. Number of food handlers receiving food safety training and education in safe food handling practices. (711, 712, 723) _____

3. Number of food handlers adopting recommended hand washing practices. (703, 711, 723) _____

4. Number of food handlers reporting taking steps to reduce cross contamination. (703, 711, 723) _____

5. Number of food preparers reporting using proper time and temperature controls. (703, 723) _____

Optional Items: How to measure indicators:

1. FDA evaluation tools, pressure gauge testing clinics, FDA audits, HAACP plans inspected and certified, certificates of completion, certified food handlers, pre and post test, and standard survey (ServSafe).
2. Pre and post test observations, pressure gauge testing, and other clinics, training, and certification numbers.
3. Reported change, clinics, observations, and use of hand sanitizers.
4. Self reporting of hand washing and use of sanitizers on counter tops and cutting boards.
5. Pre and post test observations on the use of thermometers, numbers of students who complete cooking school, inspection records, and eXtension virtual food safety "House of Germs" scores.

NOTE: There is a need to improve validation of self reporting processes on indicators

Outcome #4: ***Increase understanding of the ecology of threats to food safety from microbial and chemical sources.***

Define Outcome: To increase our understanding of the ecological impacts on the fate and occurrence of pathogens and fecal indicators in/on water, air, and land. Increase our understanding of the social, cultural, and economic impacts on the ecology of pathogens and fecal indicators in environments associated with food. Understand the interface of food with people, plants, soil, domestic animals and wildlife.

List & Define Indicators:

1. Number of projects focused on increased understanding of the ecology of fecal indicators and pathogens. (712, 723, 501, 503, +) _____

2. Number of projects focused on increased safety of all inputs into the food chain. (102, 104, 711, 712, +) _____

3. Number of projects focused on increased understanding of the roles of humans, plants and animals as vectors. (311, 721, 722, 723, +) _____

4. Number of projects focused on increased understanding of preharvest and postharvest process impacts on microbial and chemical threats. (314, 501, 503, +) _____

5. Number of projects characterizing social, economic, and/or cultural practices attributed to foodborne illness. (503, 504, 712, 723, 803) _____

Optional Items: How to measure indicators:

1. Integrated research and CRIS reports, grants, and publications.
2. State department of agriculture, FDA, EPA, and import alerts.
3. Grants, publications, and policy changes.
4. Trace-back information, USDA, FDA, FSIS, CDC, industry self-reporting, and state departments of health.
5. Culturally appropriate surveys, case studies, secondary data (regulatory information), published literature, and interviews.

+ = add new KA to 711 and 712: “Protect food through plant and animal pre and post harvest processes”

Planned Program: Global Food Security & Hunger

Outcome #1: ***Enhanced capacity of a sustainable global food system including new/improved plans, animals, technologies and management systems***

List & Define Indicators:

1. Numbers of plant releases _____
2. Number of improved animal genetics _____
3. Numbers of patents and licensing agreements _____ **(patents already captured currently in AR)**
4. Number of increased efficiencies _____ (i.e. (% pregnant) or increases in yield/unit - (bushels/acre; lbs product (meat, protein, milk) per animal; lbs feed per gain) – (**How do we measure this??? Either need to refine or remove))**
5. Adoption of best practices and technologies resulting in increased yields, reduced inputs, increased efficiency, increased economic return, and conservation of resources
    a. Number of producers indicating adoption of recommended practices _____
    b. Number of producers reporting reduction in fertilizer used/acre _____
    c. Number of producers reporting increased dollar returns per acre or reduced costs per acre _____
    d. Number acres in conservation tillage or other BMP _____

OUTCOME #2: ***More sustainable, diverse, and resilient food systems across scales.***

Define Outcome: Because there is no accepted definition of "sustainable" as an end-point, "sustainable" is typically viewed as a journey toward more sustainable endeavors. We do know what it means to be "more sustainable," and clearly recognize certain practices, behaviors, policies, and institutions as more sustainable than others. The term "scales" can apply to many dimensions of food systems. For example, it can refer to the size of farms/processors/retailers (as defined by annual revenue), the size of crop markets (e.g., wheat vs. kumquats), or land productivity levels (e.g., central Illinois farmland vs. high-plains rangeland).

List & Define Indicators:
These first four indicators deal with innovation development, adoption, and economic benefits.

1. Number of new or improved innovations developed for food enterprises. _____
   [Innovations could be any of: models (biological, economic, business, management, …), technologies, networks, products, processes, etc. that provide expanded opportunities for food system enterprises. Enterprises include all entities along the food supply chain: producers, processors, distributors, retailers, allied services, etc.]

2. Number of new or improved value-added products that can be sold by producers (and other members of the food supply chain). _____
   [While the broad category of "innovations," above, includes "value-added products, we explicitly list it here as a particularly valuable innovation leading to greater food system diversity.]

3. Number of innovations adopted in food enterprises including production, allied services, processing, and distribution. _____

4. Number of producers (and other members of the food supply chain) that have increased revenue. _____

This set of six indicators deals with acute disruptions of food systems.

5. Number of new diagnostic systems analyzing plant and animal pests and diseases. _____
   [Diagnostic systems refer to, among other things: labs, networks, procedures, access points. We have used the term "available" because maintaining capacity is just as important as developing and deploying new capacity. So, this indicator and the next one refer to both existing and recently deployed diagnostics.]

6. Number of new diagnostic technologies available for plant and animal pests and diseases. _____
   [The intent here is not to count individual pieces of equipment or devices, but to enumerate technologies that add to the diagnostic capacity.]

7. Number of first detectors trained in early detection and rapid response of plant pests, animal pests and diseases. _____

8. Number of communities trained in agricultural disaster preparedness. _____

9. Number of communities that have written agriculture and food considerations into disaster preparedness plans or procedures. _____

10. Number of networks prepared to mitigate biological and abiotic disruptions. _____

<u>These last two indicators address viable and healthy land resources that contribute to diverse and sustainable food systems.</u>

11. Number of acres that incorporate ecosystem services and/or biodiversity considerations. _____

12. Percent of privately owned agricultural acreage retained during landowner succession due to educational interventions. _____
    ["Agricultural acreage" refers to working lands, nonworking lands, and other landscape components. This includes: rangeland, forestland, cropland, conservation lands, and other, spatially included land resources that contribute non-food benefits (e.g., wetlands, water bodies, riparian areas, etc.).]

OUTCOME #3: ***Improved national and global capacity to meet growing food demands.***

<u>List & Define Indicators</u>:

Outcome: Promoting food literacy and understanding of food systems which includes the development of an inclusive, diverse and culturally sensitive workforce.

<u>Obtaining, processing and understanding basic information about food to shape decision-making</u>

1. Of the _____ number of youth participating in food system educational programs (e.g., 4-H programs and K-16 programs) _____
   a. _____ improved knowledge of food systems
      [e.g., career development educational opportunities in food systems for young adults]
2. Of the _____ number of adults participating in food system knowledge and skill enhancement programs
   a. _____ improved knowledge of food systems

<u>Development of research-based, educational materials dedicated to food systems</u>

3. Number of extension publications and presentations (fact sheets, white paper, web-based learning modules, etc.) _____
4. Number of extension learning opportunities _____

Outcome: Engaging the public in the development of sound, favorable polices for food access and distribution.

Public engagement

Indicators:

11. Number of food councils and institutes created to promote practical food systems policies _____
12. Number of research and extension advisory councils and boards _____
13. Number food policy decisions informed by university research and extension _____
14. Number of constraints removed in food production, processing, and distribution by policy makers _____
15. Number of incentives implemented for food production, processing, and distribution by policy makers _____

OUTCOME #4: ***Reduction in hunger: Larger quantities of healthy food eaten by the hungry***

Outcome: Improved access, availability, affordability to vulnerable populations

Indicators:

1. Number of pounds of fresh produce donated for consumption by vulnerable populations _____
2. Number of pounds of shelf stable items donated for consumption by vulnerable populations _____
3. Number of individuals/families eligible for government food assistance using non-public food distribution resources _____

Outcome: Increased research to identify culturally relevant and sensitive solutions to hunger.

Indicators:

1. Number of hunger reducing solutions created _____
2. Number of hunger reducing solutions adopted by communities/organizations _____

Outcome: Increased partnering across parochial boundaries to reduce hunger

Indicators:

1. Number initiatives accessing new multisector, multidisciplinary, and intergenerational resources from partnerships _____

Outcome: Community action to reduce food disparity

Indicators

2. Number of individuals increasing understanding the causes and implications of hunger _____
3. Number of community action plans implemented as a result of science and community based assessment _____

Outcome: Communities solve their own hunger problems

Indicators:

4. Percentage of individuals eligible for public food assistance utilizing local non- state/federal government resources _____

Planned Program: Sustainable Energy

OUTCOME #1: ***Energy Security: U.S. replaces a portion of fossil fuel consumption with biofuels.***

List & Define Indicators:

1. Number of gallons of fossil fuels displaced, _____
2. Number of gallons of biofuels consumed, _____
3. Number of gallons of biofuel produced; _____
4. BTUs utilized from biomass/biofuels; _____
5. Amount of on-farm biofuels consumed. _____

OUTCOME #2: ***Economic Development: An enhanced or improved economy as a result of bioenergy development.***

List & Define Indicators:

1. Number of new rural careers created; _____
2. Number of new urban careers created; _____
3. Number of jobs maintained/created; _____
4. Number of small businesses; _____
5. Increased revenue/increased savings/one-time capital purchases (In dollars); _____
6. Increased private income (In Dollars) _____

Optional Items: DESCRIPTION: Difference between "jobs" and "careers"; jobs are net gain; new businesses created; DOD Office of Procurement formula for "jobs created or maintained"; community health measured (?)

OUTCOME #3: ***Improved environmental conditions through sustainable biofuel production and utilization***

List & Define Indicators: **(No specific indicators developed. So this outcome will not be in the POW.)**

OUTCOME #4: ***Implementation of sustainable biofuels systems***

List & Define Indicators:

1. Acres of dedicated bioenergy crops produced; _____
2. Number of farmers who adopted a dedicated bioenergy crop; _____
3. Number of dedicated energy crops; _____
4. Tons of feedstocks delivered; _____
5. Creation of new business systems to provide new industry growth; _____
6. Measure of biofuels (gallon/acre); _____
7. Measure of BTUs/acre produced in energy production _____

Optional Items: DESCRIPTION: New systems complement existing systems; qualitative information regarding new cropping systems; implement new practices and technologies (e.g. cropping systems, biomass technologies; biofuel feedstock). Technical definitions needed for rreporting BTUs/acre. Use of decision making models (LCA) by researchers and policy/decision makers; qualitative report where information is used for policy-building/support

OUTCOME #5: ***Increased knowledge and understanding of the biofuels supply chain***

List & Define Indicators:

1. Number of new technologies developed; _____
2. Number of new varieties or other new feedstock sources (residues/urban wood waste) developed; _____
3. Of the _____ number of stakeholders participating in programs on production/harvesting/storage systems
    a. _____ Increased knowledge;
    b. _____ Actually adopted BMPs for production/harvesting/storage systems.
4. Number of new production/logistic practices developed _____

Optional Items: DESCRIPTION: New species/varieties identified; issues regarding sustainable production practices/transportation/harvesting/storage practices developed and diseminated; new technologies are measured by the number of patents, licensing agreements, etc.

OUTCOME #6: Integration and evaluation of sustainable biofuels and bioproducts systems

List & Define Indicators:

1. Number of decision tools available; _____
2. Number of LCA datasets available; _____
3. Number of life cycle datasets validated; _____
4. Number of alternative uses of feedstock identified; _____
5. Of the _____ of Producers participating in programs on decisions models, the number that increased knowledge of decision models _____
6. Of the _____ of Policy Makers participating in programs on decisions models, the number that increased knowledge of decision models _____

Optional Items: DESCRIPTION: Conversion technologies; co-product opportunities; holistic assessment of individual supply chain components

OUTCOME #7: ***Develop a diverse and educated workforce for a biofuels industry***

List & Define Indicators:

1. Number of undergraduates working in biofuels labs _____
2. Number of graduate students working in biofuels labs _____
3. Number of biofuels workers trained _____
4. Number of youth who gain science process skills in biofuels_____
5. Number of persons in biofuels internships _____
6. Percentage of under-represented persons entering the biofuels industry workforce _____

Optional Items: DESCRIPTION: continuing education, STEM, diversity, report on demographics of trainees (gender, race, socio-economic status, age, ethnicity, current employment status, rural status)