2006 - 2011 SAAESD PROGRAMMATIC PLAN

Science Roadmap for Agriculture Challenge Areas & Objectives

SAAESD Priority Area for Multistate Research Activities (in bold)

1. We can ensure food safety and health through agricultural and food systems.

- Eliminate food borne illnesses.
  - **Food safety**
  - **Prevent transmission of human disease agents**

- Develop technologies to improve the nutritional value of food and create health-promoting foods.
  - **Value-added plant and animal genes in conventional breeding and molecular biology**
  - **Nutritional quality of plant and animal food products**
  - **Functional foods for enhancing health**
  - **Bio-based products (other than fuels)**

- Understand the behavioral dimensions (personal, consumption, and policy) that influence personal and family dietary and health decision-making to reduce public health issues, such as obesity.
  - **Food choices for optimum nutrition and individual health**

- Develop policy and strategies to address agro-security, bioterrorism, and invasive species to protect producers and consumers.
  - **Food security**
  - **Foreign animal diseases, particularly avian influencia and BSE**
  - **Agriculture-related social and consumer concerns**

2. We can provide the information and knowledge needed to further improve environmental stewardship.

- Develop better methods to protect the environment both on and beyond the farm from any negative impacts of agriculture through optimum use of cropping systems including agroforestry, phytoremediation, and site-specific management.
  - **Multiple uses of agricultural lands**
  - **Precision agriculture**

- Find alternative uses for the wastes generated by agriculture.

- Develop more environmentally friendly crop and livestock production systems that utilize sustainable weed, insect, and pathogen management strategies, along with feeding strategies that promote environmental stewardship.
  - **Environmentally benign agricultural operations**
  - **Nutrient management in agricultural systems**
  - **Integrated pest management systems, including biologically-based tactics**

- Develop better strategies, ecological and socioeconomic systems models and policy analysis to address soil, water, air and energy conservation, biodiversity, ecological services, recycling, and land use policies.
  - **Air, soil, and water resources conservation and enhancement**
  - **Natural resource and ecosystem management**
  - **Environmental policy and regulations**

3. We can improve the economic return to agricultural producers.

Public policy & economics of agricultural production systems
Economic and policy analysis of agricultural industrialization

- Develop sustainable production systems that are profitable and protective of the environment, including finding ways to optimize the integration of crop and livestock production systems.

  Integrated and sustainable agricultural production systems

- Develop strategies for integration of local, regional, national, and global food systems to maximize the benefits to both U.S. agriculture producers and consumers throughout the world.

  Competitiveness in international markets

- Design improved decision support systems for risk-based management of farms, ranches, and forests/woodlots.

  Risk management and assessment in agricultural systems

- Find ways to improve on strategies for community-supported food and fiber production systems.

4. We can strengthen our communities and families.

- Stimulate entrepreneurship and business development in rural communities and new forms of economic activity built around regional trade associations, rural cooperatives, and local production networks.

  Rural community development and revitalizing rural economies

- Build coalitions among environmental, labor, and community development groups to facilitate democratic social change to ensure that families have access to food, health care, education, and welfare services

- Enhance the problem solving capacities of rural communities through leadership development

- Determine strategies to enhance the well-being of families and individuals.

  Prevention and treatment of diet-related diseases

5. We can develop new and more competitive crop production practices and products and new uses for diverse crops and novel plant species.

Value-added plant and animal genes in conventional breeding and molecular biology
New plant and animal species for agricultural production
Bio-based products (other than fuels)
Bioenergy and alternative fuels from agricultural products

- Conceive new markets for new plant products, and new uses for those crops.

- Develop technologies to improve processing efficiency of crop bioproducts.

  Plant and animal food and fiber processing systems

- Support the development of marketing infrastructure for crop bioproducts.

- Improve crop biomass quantities, qualities and agricultural production efficiencies.

6. We can lessen the risks of local and global climatic change on food, fiber, and fuel production.

- Diminish the rate of long-term global climatic change by increasing the storage of carbon and nitrogen in soil, plants, and plant products.

- Create broad-based, comprehensive models to assess the socioeconomic impacts, risks, and opportunities associated with global climate change and extreme climate events on agriculture and natural resources.

- Integrate long-term weather forecasting, market infrastructures, and cropping and livestock management systems to rapidly optimize domestic food, fiber, and fuel production in response to global climatic changes.

- Minimize the effects of long-term global climatic changes on production of crops, livestock, forests, and other natural resource systems.
  Climate change and its affect on agriculture, forestry, and environmental systems

7. We can develop new and more competitive animal production practices and products and new uses for animals.
  New plant and animal species for agricultural production
  Bio-based products (other than fuels)
  Plant and animal food and fiber processing systems

- Develop innovative technologies for reducing the impact of animal agriculture on the environment.

- Enhance the value of food and other animal products for both the producer and consumer by using conventional and newly developed technologies that are socially and ethically acceptable.
  Value-added plant and animal genes in conventional breeding and molecular biology
  Interrelationships of food animal health and human health
  Agriculture-related social and consumer concerns

- Develop new and enhanced technologies for the improved efficiency and welfare of animals that are processed for food.
  Health and well-being of food animals

- Improve conventional technologies as well as developing new technologies to improve the efficiency of animal production.