



*Facilitating Education, Research,  
and Technical Assistance  
to the Food Industries*

# FOOD SCIENCE INSTITUTE

KANSAS STATE UNIVERSITY



# I. Background – Food Science Program

A. Food Science Graduate Program - 1965

B. Food Science and Industry Undergraduate Program – 1972

C. Food Science Institute – 2001

1. Teaching
2. Research
3. Extension

## II. Mission and Faculty

- A. Facilitating Teaching, Research and Technology Assistance to the Food Industries.
- B. Enhancing Capacity and Visibility.
- C. 5 Colleges, 11 Departments, 43 Faculty.

# III. Program Areas of Emphasis

A. Undergraduate Program.

B. Graduate Program.

C. Distance Learning.

1. Undergraduate Certificate
2. B.S. Degree
3. Minor
4. Graduate Certificate
5. M.S. Degree



\* Other Closely Related Degree/Option Programs Serving the Food Industry

Bakery Science    Hotel, Restaurant, Institution  
Management, and Dietetics

Milling Science    Human Nutrition/Sensory Analysis

Animal Products    Public Health  
Food Inspection

Master of Agribusiness

\* New Initiatives

Grain Food Products Processing and Development Option

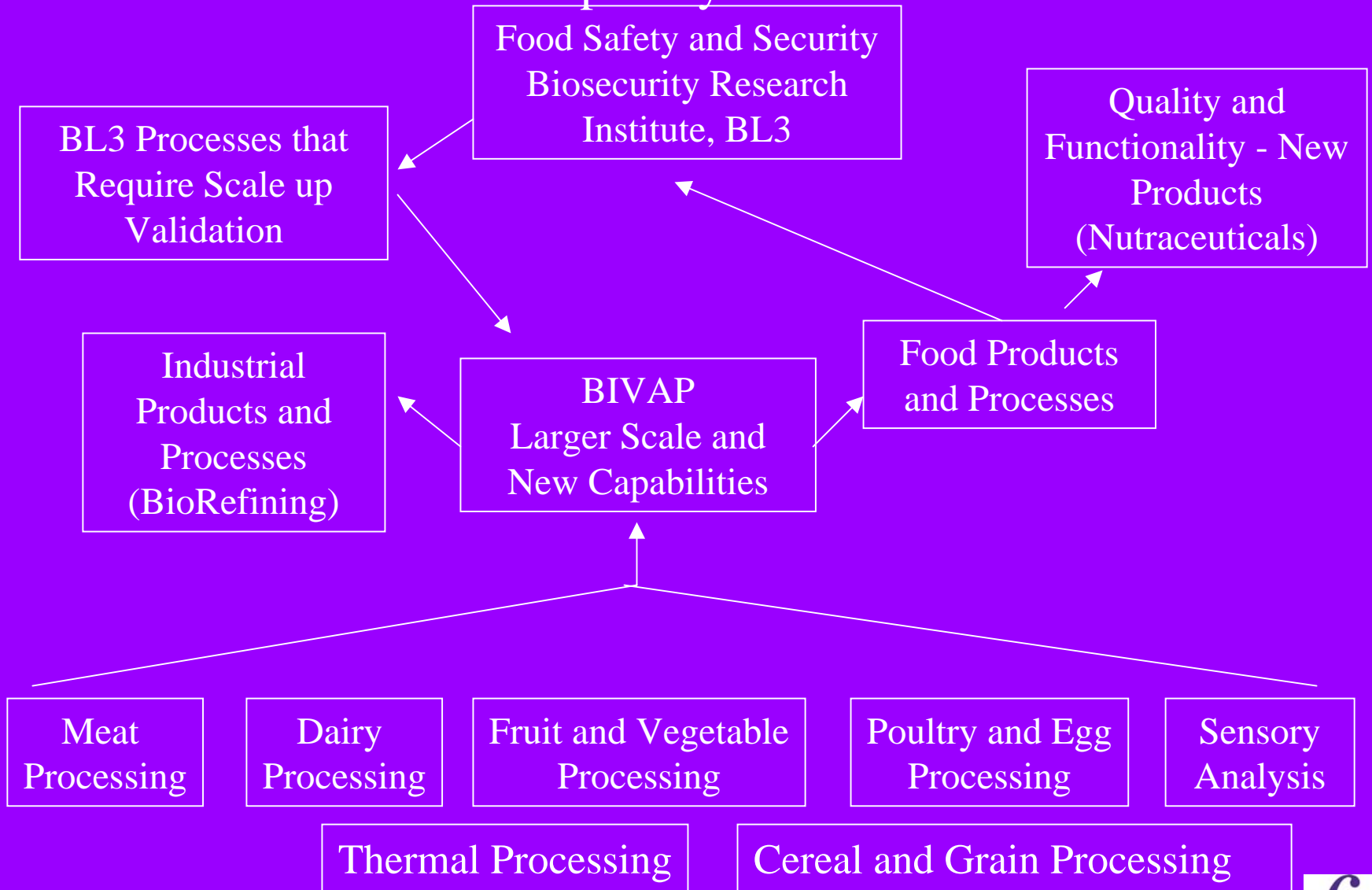
# III. Program Areas of Emphasis

## D. Value Added Program

1. Agricultural Product Utilization Forum.
2. Bioprocessing and Industrial Value Added Program, BIVAP



### 3. Value Added Interdisciplinary Network





# III. Program Areas of Emphasis

## E. Functional Foods and Nutraceuticals Program.

1. Team to Study Health Impacts from Grain-Based Diets.
2. Research Areas:
  - \*Anti-oxidant capacity of grain-based diets
  - \*Gluten sensitivity
  - \*Chronic disease prevention with whole grain diets:
    - Cancer
    - Diabetes
    - Cardiovascular disease
    - Obesity
  - \*Glycemic index
  - \*Value added product development
  - \*Information and technology transfer
  - \*Genetic engineering of products to enhance health.
3. Other Commodity Areas and Health Impacts.
  - \*Benefits of dairy, egg, fruit, meat, and vegetable food products



## F. Food Safety and Security Program.



# 1. Animal Science Food Safety Consortium (FSC)

- 1988  $\Rightarrow$  Present
- KSU – Beef, ISU – Pork, UARK – Poultry Crossover synergism across species
- Continued Focus

1. Rapid and Automated Isolation, Detection, and Quantification Methods for Microbial and Chemical Hazards

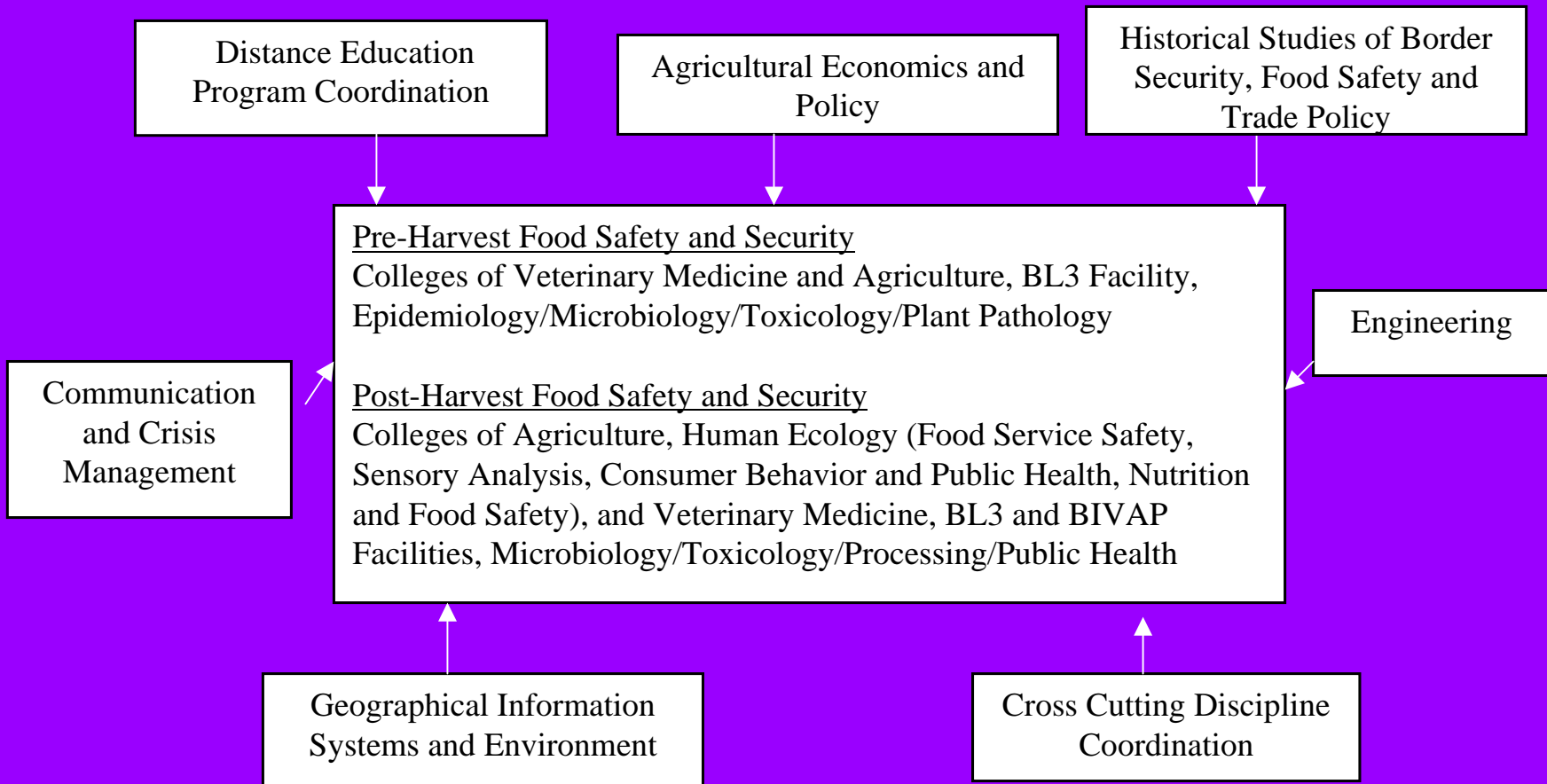
2. Hazard Elimination

Funding since 1988 has allowed KSU to build a comprehensive food safety focus.

## 2. Food Security Initiatives are Building on FSC Funding for Food Safety.

Targeted Excellence funding allows us to bring together an interdisciplinary team for a comprehensive approach to food safety and security with fulltime coordination.

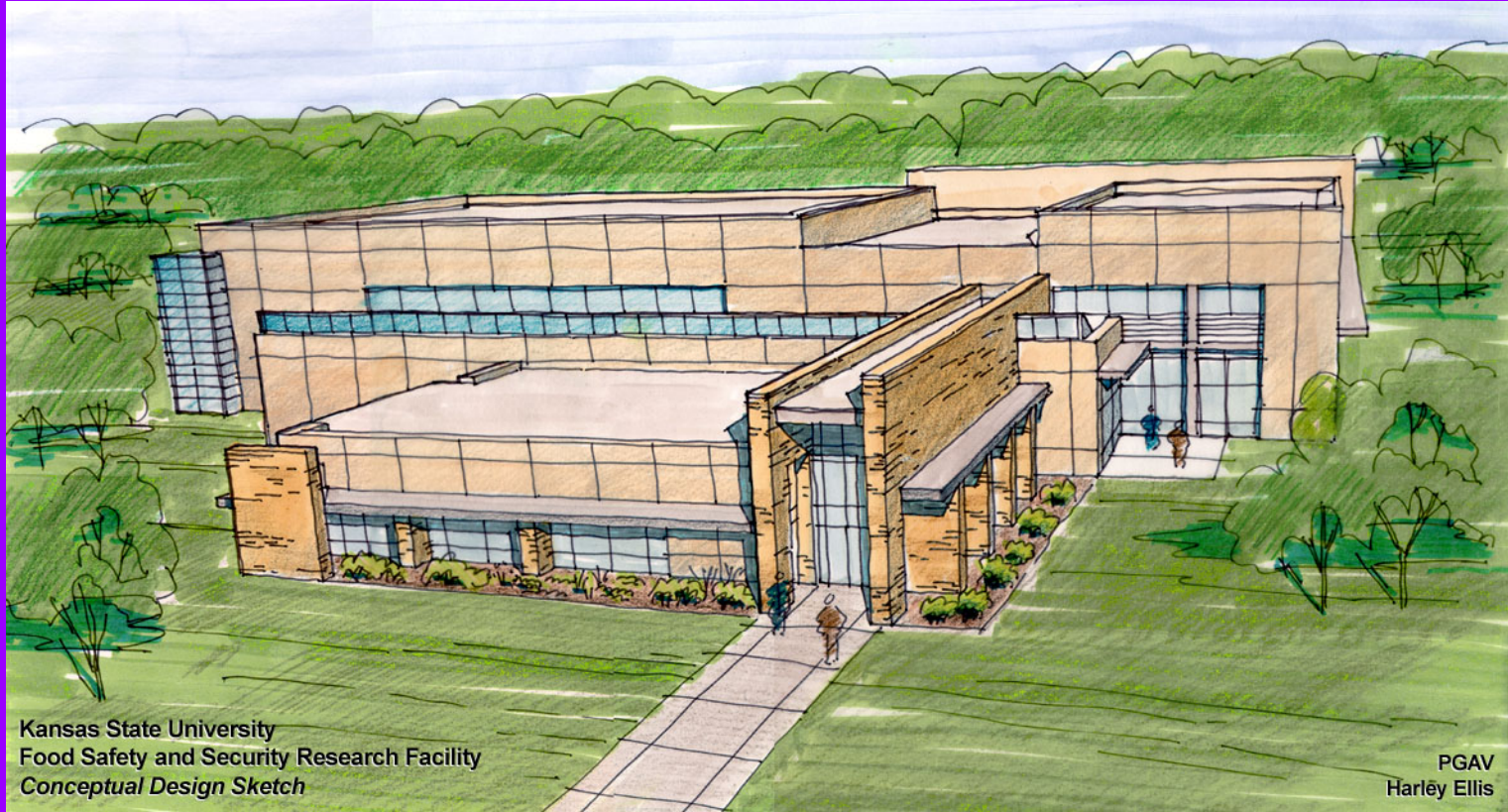
Agricultural and Food Security Forum



### 3. Biosecurity Research Institute

- Biosafety Level 3 Research Facility
- Animal and Plant Production
- Food Processing, BL2/3
- Actual Hazard Evaluation

# Biosecurity Research Institute



Kansas State University  
Food Safety and Security Research Facility  
Conceptual Design Sketch

PGAV  
Harley Ellis

# BRI Food Safety and Security Research

- Same types of research as currently performed-
  - Expanded, larger scale (to full size) equipment, systems-focused
  - Linking pre-and post-harvest elements
- Expand to include more biological agents
  - Viruses, *C. Botulinum*, *B. anthracis*, toxins
  - Larger inoculation volumes with potential for aerosolization
  - Effect of processing methods and survival characteristics of threat agents
  - Validate disinfection technologies and detection systems used against threat agents

# BRI Food Safety & Security Research

- Prion research
- Validation of carcass disposal technologies against various biological agents
- Decontamination strategies for numerous environmental situations
  - Hotel rooms
  - Offices
  - Cruise ships
  - Livestock production facilities
- Emergency response exercises



# Teaching and Extension Efforts

## Background Courses/Modules

- Basic Chemistry
- Basic Food Microbiology
- Statistics for the Sciences
- Basic Epidemiology
- Basic Toxicology

# Teaching and Extension Efforts

## **Communication and Risk Assessment**

Basic Risk Assessment, Management, and Communication

- Individual and Societal Considerations and Crisis Management Related to Bioterrorism Threats

## **History, Policy and Regulations**

- History, Public Policy and Regulations and Diplomacy Related to Bioterrorism Threats
- Economic Principles of Agriculture and Food Security
- Food Laws and Regulations

# Teaching and Extension Efforts

## **Security**

- Border Security
- National Security
- Physical Site Security
- Contemporary International Security Issues
- Terrorism
- Bioterrorism Threat Response for Agricultural Community
- Site Clean-up and Disposal

## **Public Health**

- Public Health Strategies Related to Food Safety and Security

# Teaching and Extension Efforts

## **Laws and Criminal Justice**

- Forensics in Agriculture and Food Bioterrorism
- Report/Notification of Agencies, Bioterror Threat and Event
- The Craft of Intelligence Against Bioterrorism

## **Food Production**

- Plant and Animal Production Strategies Related to Food Safety and Security

## **Food Processing**

- Food Processing Strategies Related to Food Safety and Security

# III. Program Areas of Emphasis



## G. Food and Agricultural Issues Program

### 1. Interdisciplinary Team for Response to Food and Agricultural Issues



## G. Food and Agricultural Issues Program

Interdisciplinary Teams - Justification, Formation,  
Continuation, and Future Potential

Food Science Institute Examples and Model that  
Works

\*Distance Education Programs

\*USDA, APHIS Grant

\*Targeted Excellence

# 1. Introduction/Justification

- \*Today's issues are complex with many facets. For example, requests for proposals generally require an interdisciplinary approach.
- \*Clientele expect to contact university and get a comprehensive answer from one source.
- \*All universities have similar capabilities, but it's the ones that continuously coordinate interdisciplinary teams that will lead into the future.
- \*Interdisciplinary teams and their coordination require administrative support and recognition.



## 2. How to Form Teams

- \*Communicate overview vision of the approach to generate interest. Faculty and staff with interdisciplinary interest and vision are needed to catalyze this.
- \*Communicate with potential team members as well as their department heads to determine interest and buy-in. Communicate the vision clearly at every opportunity.
- \*Identify what is in it for each team member and their administrative unit.
  - ✓ Administrative goals
  - ✓ Departmental resources
  - ✓ Faculty resources

### 3. How to Continue Team Efforts

- \*Provide resources for each team activity. Team members as well as departments need to receive support. Support goes to departments and is not held centrally.
- \*Communicate on a regular basis with department heads, deans and their faculty.
- \*Provide continuous coordination by academically qualified interdisciplinary trained faculty/experienced facilitators for team activities.
- \*The reason interdisciplinary efforts frequently fail is that discipline specific faculty team members are busy with other responsibilities and cannot also devote consistent effort to this coordination.
- \*Therefore, success of interdisciplinary efforts is dependent on integration of discipline specific efforts by interdisciplinary facilitators who can finish the task.

## 4. How to Continue Team Efforts

\*University faculty facilitators with interdisciplinary focus and training could be tasked to blend discipline specific input to:

- ✓ Respond to opportunities
- ✓ Provide new resources and
- ✓ Integrate output from the collective effort, i.e. finish the effort.

\*Interdisciplinary coordination efforts recognized as a scholarly activity for promotion and tenure purposes.

\*Interdisciplinary coordinators/facilitators should also contribute their research input into the interdisciplinary effort.

Same model could be expanded for other interdisciplinary initiatives?  
Facilitators need to be “close enough” to initiatives to be able to “finish”.

# IV. FSI- Organization and Integration

- A. Undergraduate and Graduate Program Coordinating Committees - Autonomy
- B. Program Area Coordinators  
Communicate Programs - Autonomy
- C. Advisory Committees – Informal versus Formal Structure?
  1. Department Heads and Deans
  2. Industry Partners Council
    - a. Internships
    - b. Scholarships and Assistantships
    - c. Training Programs for Industry
    - d. Research

Devote time to know how initiatives are received and respond accordingly.

- D. Coordination of Interdisciplinary Teams by Academically Qualified, Interdisciplinary Trained/Experienced Faculty.