

**National Institute of Food and Agriculture (NIFA)-
Formerly Cooperative State Research, Education, and
Extension Service (CSREES)**

**Established in 2008 Farm Bill (Food,
Conservation, and Energy Act of 2008)**

- Work with the best and brightest scientists at universities and colleges and other institutions throughout the U.S. and the world to find innovative solutions to global problems
- Collaborates with other federal science agencies; NIFA will also serve as a vital contributor in science policy decision-making.



NIFA Budget (\$ x 1,000)

TYPE of Grant	FY 2010*	FY 2011**
Research and Education	692,510	843,379
Integrated	60,022	24,874
Extension	394,923	479,203
Mandatory and Endowment (mostly integrated)	140,880	152,880
TOTAL (non-overlapping)	1,188,335	1,200,336

* Appropriated; ** President's Request



AGRICULTURE and FOOD RESEARCH INITIATIVE (AFRI)

- AFRI is NIFA's flagship competitive grant program
- Established under section 7406 of the 2008 Farm Bill.
- FY 2010 budget of \$ 262 M +
- FY 2011 President's budget of \$ 429 M
- NIFA issued five AFRI RFAs to address the priorities (Global food security, Childhood obesity, Food safety, Climate change and bioenergy) plus a foundational RFA for basic and applied research. A pre and postdoctoral fellowships RFA will be issued soon

AGRICULTURE and FOOD RESEARCH INITIATIVE (AFRI)

Grants will be:

- Larger with funding up to \$25 million
- Longer in duration with up to five years
- In some cases, renewal upon achieving specific goals
- Up to \$5 million in funding opportunities for pre- and postdoctoral fellowship grants
- 10% Set aside for FASE awards
- Research (Basic, & Applied), stand alone Extension and Education, and Integrated

AGRICULTURE and FOOD RESEARCH INITIATIVE (AFRI)

- **Expectations:**

Greater collaborations

Stakeholder involvement

Tangible outcome and Impact

- Keep American agriculture competitive while ending world hunger
- Improve nutrition and end child obesity
- Improve food safety for all Americans
- Secure America's energy future through renewable biofuels
- Mitigate and adapt agriculture to variations in climate



Priority Science Areas

1. Global Food Security and Hunger

NIFA supports new science to:

- Boost U.S. agricultural production,
- Improve global capacity to meet the growing food demand, and
- Foster innovation in fighting hunger by addressing food security for vulnerable populations



Priority Science Areas

2. Climate Change .

NIFA-funded projects Help:

- Generate knowledge to develop an agriculture system that maintains high productivity in the face of climate changes.
- Producers to adapt to changing environments and sustain economic vitality while taking advantage of opportunities offered by climate change mitigation technologies.



Priority Science Areas

3. Sustainable Energy

- NIFA contributes to the President's goal of energy independence
- Provides grants to:
 - Develop biomass used for biofuels, design optimum forestry and crops for bioenergy production, and
 - Produce value-added bio-based industrial products



Priority Science Areas

4. Childhood Obesity

NIFA-supported programs ensure that:

- Nutritious foods are affordable and available, and
- Provide guidance so that individuals and families are able to make informed, science-based decisions about their health and well-being.



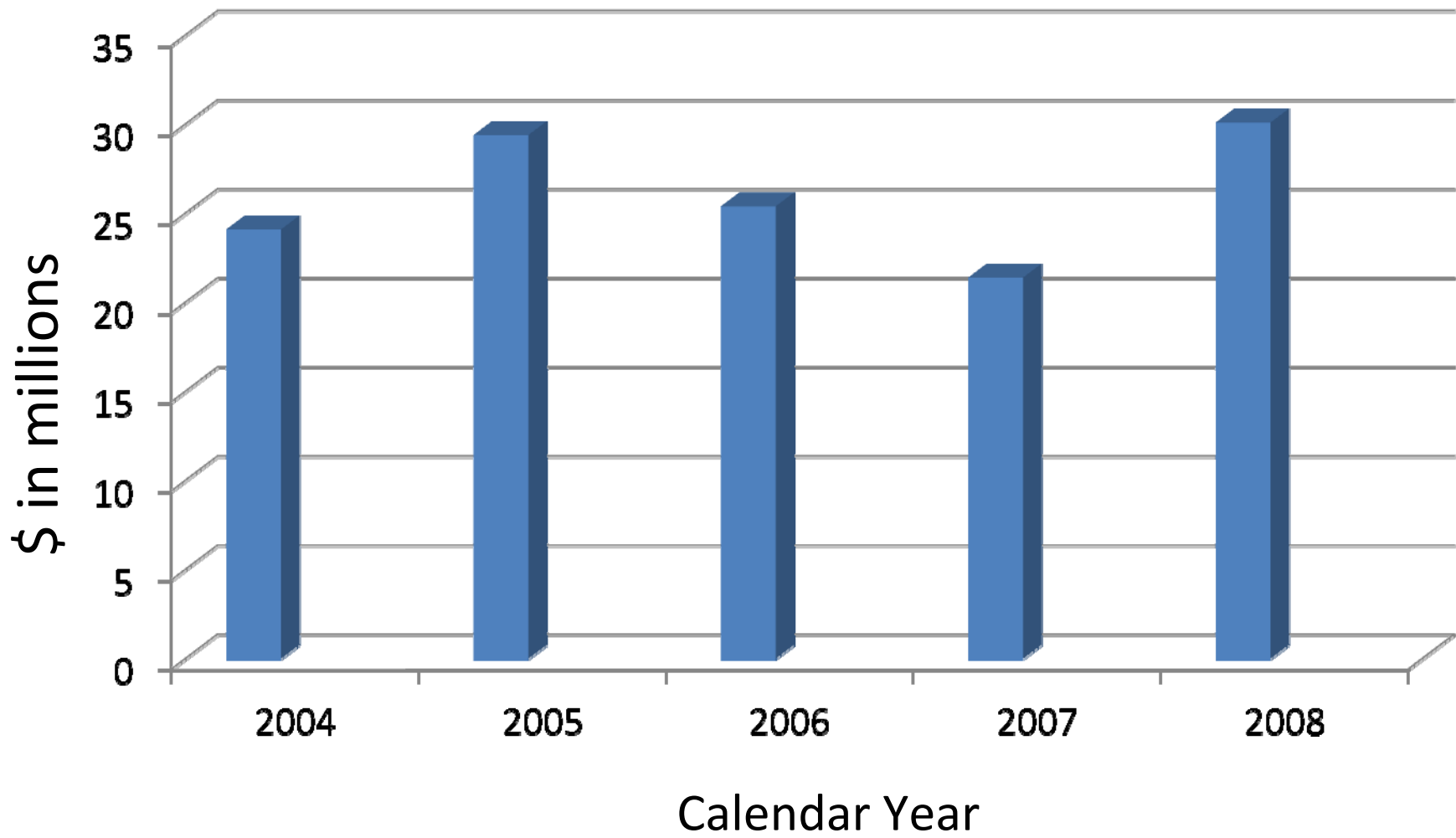
Priority Science Areas

5. Food Safety

NIFA food safety programs work to:

- Reduce the incidence of food-borne illness, and
- provide a safer food supply
by Addressing
- Causes of microbial contamination and antimicrobial resistance,
- educating consumer and food safety professionals, and
- developing food processing technologies.

NIFA FUNDING TRENDS IN AG. and FOOD CHEMISTRY



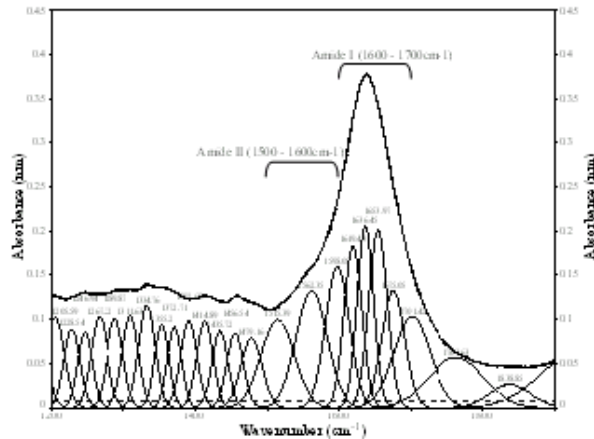


Thank you

Examples of funded projects in food chemistry



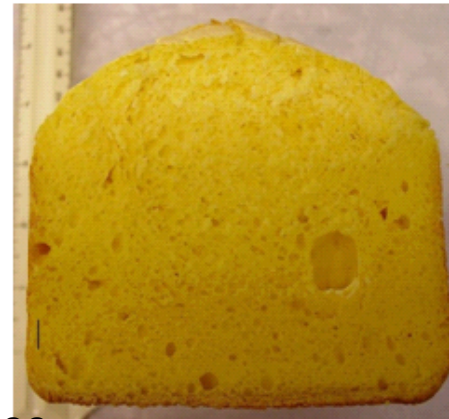
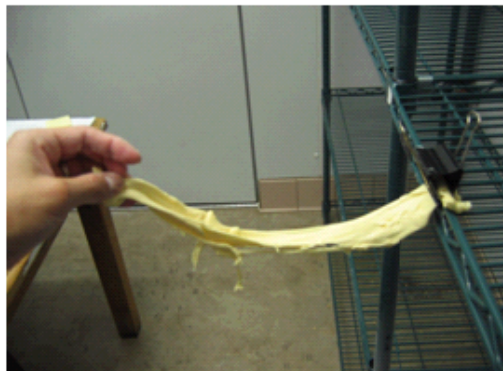
FT-IR to Measure 2° Structure



Wheat Gluten



Corn Zein



Hamaker et. al. 2009

Figure 1. Viscoelastic corn zein-starch dough and yeast-leavened bread loaves made with wheat flour (top) and a composite of 87% starch and 12% corn zein with addition of 1% casein co-protein (bottom).

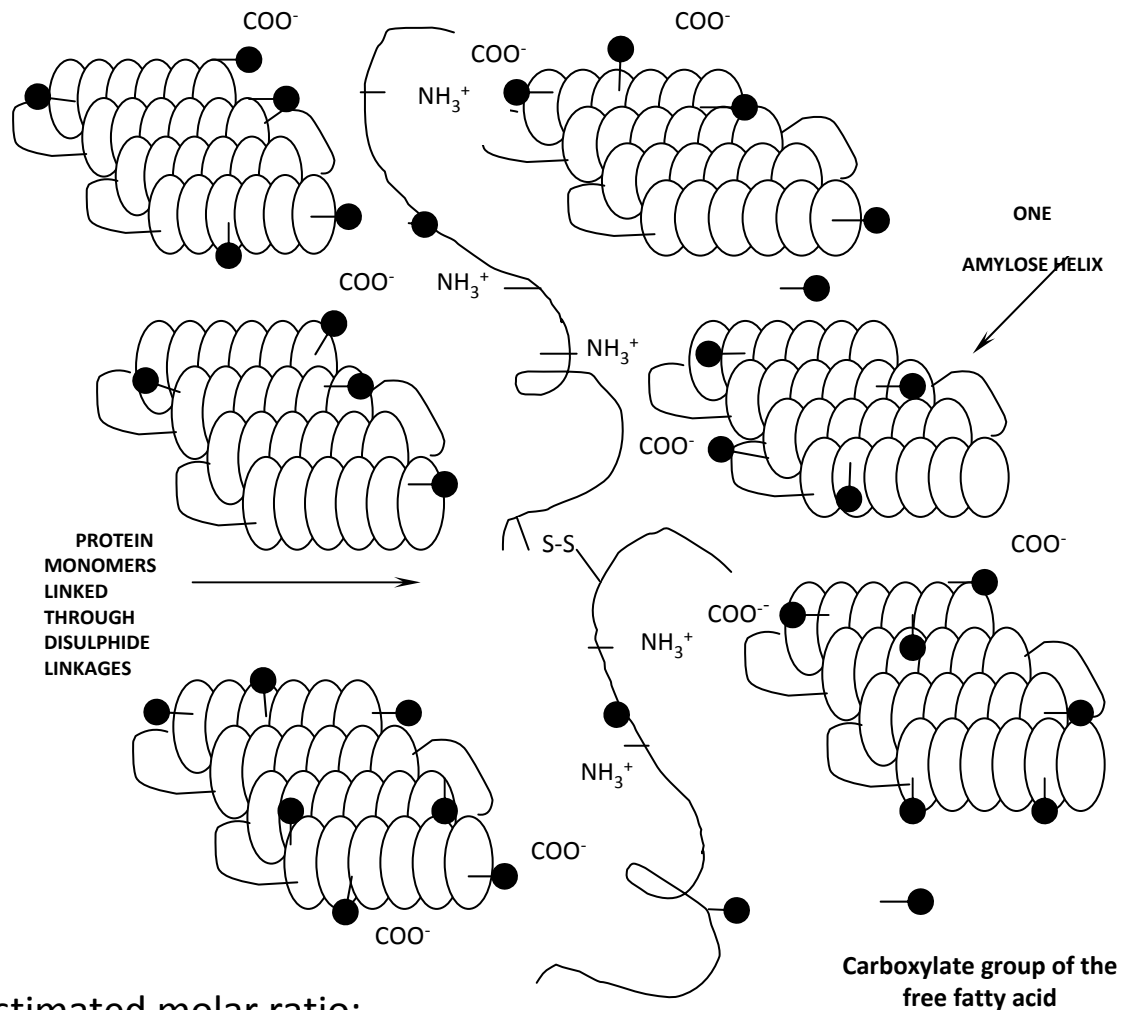


Interaction with lipids increases Enzyme resistance of Starch

Mechanisms of interaction of molecular food components affecting quality

- X-Ray diffraction study shows that partially gelatinized amylose starch complexes with select lipids shows a V pattern (helical) pattern in addition to intrinsic B-pattern
- Complex shows higher enzyme resistance to enzyme digestion
- Ingestion of bread with the complex reduces postprandial plasma-glucose and insulin responses by 55% and 43%, respectively

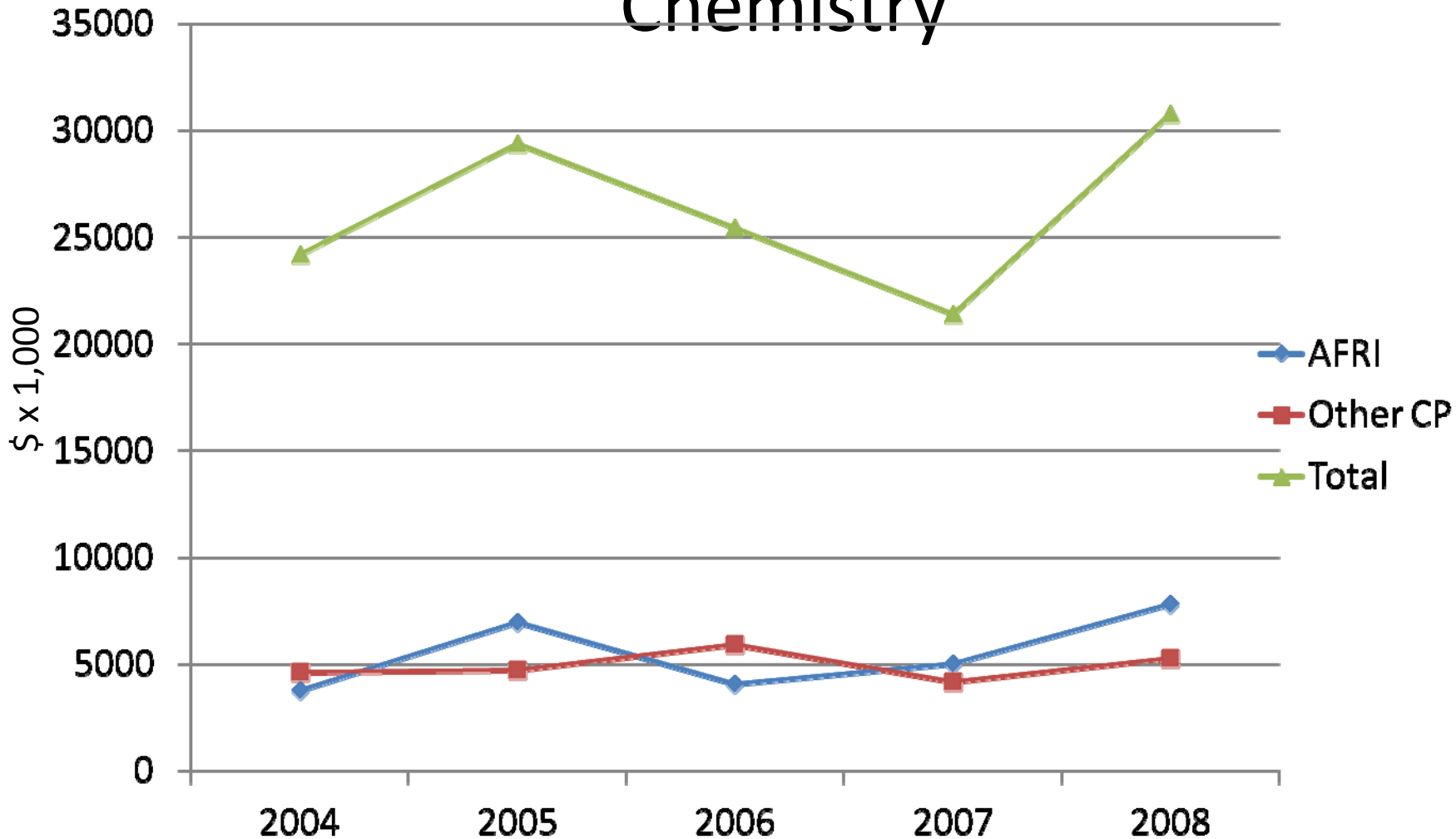
Jay-Lin Jane et. al, 2009



Estimated molar ratio:
 6 amylose (corn): 2 protein (monomer): < 300 FFA
 considering molecular weights of components
 30 amylose:10 protein: < 1500 linoleic acid.



Trends in NIFA Funding in Agricultural Chemistry



Trends in NIFA Funding in Agricultural Chemistry

FY/SOURCE:	NIFA	\$ Leveraged		
		SAES (\$ million)	Other	Total
2007	21.4	47.4	25.2	94.0
2008	30.8	47.9	26.1	104.8



NIFA Competitive Funding (Blue)

Comparison of 2010 and 2011 budgets

Total budget is about the same (slight increase of \$ 12 M)

A large Increase in competitive funds is due to an **increase in AFRI from \$ 262 M to \$ 429M.** (funds moved from special research and integrated grant line items)

