Innovation in the rendering industry

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Fats and Proteins Research Foundation

• Founded in 1962
• Direct and manage a research process that results in an enhanced current usage and the development of new uses for rendered animal products
  – Nutrition, biosecurity, food safety, non-feed uses, biofuel
• Completed over 600 projects
FPRF Research Funding

• Robust research program
• Two funding streams
  – At-large
  – ACREC
“At-Large” Research

- Annual funding about $400,000 in 10 projects
- Currently focused on animal nutrition, food safety
- RFPs due twice a year, in March and September
- Current projects…
Effect of different fat sources and vitamin E status on antioxidant status, carcass characteristics, and meat quality of pigs grown to heavy slaughter

- Merlin Lindemann, University of Kentucky
- Joint project with National Pork Board
- Look at the effect of different fat sources and vitamin E status on antioxidant status, carcass characteristics, and meat quality of pigs grown to a heavy slaughter weight
Pet Food

• Greg Aldrich, KSU
• Flow behavior and spray coating efficiency during production of rendered protein meals
Assessing Factors Affecting *Salmonella* in Poultry Fat

- Dr. Valentina Trinetta, Dr. Cassandra Jones, and Dr. Aldrich, KSU
- Objective = identify the roles of moisture, storage temperature, contamination type, and contamination level on *Salmonella* spp. concentration over time
ACREC Mission Statement

• To advance the science and technology of animal co-products and the rendering process.
• To ensure microbial safety of rendered products for animal feeds and consumer protection.
• Promote environmentally sound practices.
• Develops new market opportunities for the worldwide rendering industry.
• Provides educational opportunities in animal co-product utilization.
ACREC

- Approximately 50 total since 2004.
- More than 40 researchers from a variety of fields
- Interdisciplinary, innovative projects

- Chemical engineering
- Microbiology
- Materials science and engineering
- Bioengineering
- Mechanical engineering
- Animal science
- Food science
- Packaging science
- Biological science
- Experimental statistics

- Chemistry
- Architecture
- Environmental engineering
- Automotive engineering
- Agricultural engineering
- Soils
- Turfgrass
- Environmental toxicology
- Horticulture
- Computer science.
Optimization and Initial Bioprocess Scaleup of Omega-3 Production From Rendered Fat

• Mark Blenner
• New line of work for fats, being done with glucose already
Self-healing rendered protein based thermosets for high value automotive applications

- Srikanth Pilla
- New line of work with ICAR
- Value added
Odor Elimination

- Daniel Whitehead and Frank Alexis
- Destroying malodorants with biodegradable nanoparticles
- Using nanoparticles to target and eliminate odors
- Proved the ability to capture short chain FA pollutants
- Proved the nanoparticles are non-toxic, biodegradable
- Working on proving selectivity for specific functional groups
  - carboxylic acids
  - sulfides
- Hexanal headspace analysis
- Could lead to effective odor control
Wastewater Treatment

- Development of a field deployable membrane bioreactor/seperator for rendering facility wastewater treatment
- David Ladner
Antioxidant Production

• Vladimir Reukov and Alexey Vertegal
• Producing a novel antioxidant that is both natural, effective, and cost-effective.
• Potent antioxidant from animal by-products
• As effective or better than available antioxidants
• Byproducts not wasted!
Solvent Extraction of Oils from DAF Sludge and Reuse of Recovered Flocculant

• Dr. Chris Kitchens
Other Recent Research

- Carbon footprint
- Lifecycle analysis for GHG emissions
- Aquaculture
- Thermal death time
Conclusions

- Active research program
- Innovation!
- Currently focused on pet food, plant operations, microbiology
- Exploring better lab-to-market paths for inventions
Questions?