

The NEW K-State Feed Mill & Biorefinery Teaching & Research Facility



**A PARTNERSHIP BETWEEN K-STATE and
THE GLOBAL GRAIN, FEED & LIVESTOCK
INDUSTRY**

Presentation Outline

- Purpose of this facility, its importance, how it will function, and who it will serve
- Update on progress and an estimated timeline
- Areas where additional industry support is needed

Purpose of New Feed Mill

1. Serve as a teaching laboratory for FSM and ASI students and faculty
2. Serve research needs for the GSI and ASI departments and the feed and livestock industries
3. Serve as an outreach facility for domestic and international industry professionals
4. Serve as the production facility for precision diets for ASI, BRI and NBAF research





*“The Next Generation of Professionals
for the Global Grain & Feed Industry”*

KANSAS STATE UNIVERSITY



Courses Benefitting from New Feed Mill

- GRSC 210 - CAD Flow Sheets
 - GRSC 510 - Feed Technology I
 - GRSC 610 - Electricity in the Grain Processing Industry
 - GRSC 661 - Qualities of Feed & Food Ingredients
 - GRSC 690 - Feed Technology II
 - GRSC 651 - Food and Feed Product Protection
 - GRSC 655 - Cereal Food Plant Design
 - ASI 318 - Fundamentals of Nutrition
 - ASI 320 - Principles of Feeding
 - ASI 515 - Beef Science
 - ASI 524 - Sheep and Meat Goat Science
 - ASI 535 - Swine Science
 - ASI 621 - Dairy Cattle Management
- **Over 250 students** enrolled in these **13 courses** per year

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Historical Research Impact

- Grinding efficiency & particle size analysis
 - Mixing performance & mix uniformity
 - Pelleting efficiency & pellet quality
 - Adding value to co-products
 - Product testing & development
 - Basic & applied animal nutrition
 - Feed processing effects on animal performance
- ➔ A majority of current FDA-approved feed additives were tested at K-State prior to approval

Planned Research Efforts in New Feed Mill – Future Industry Impact

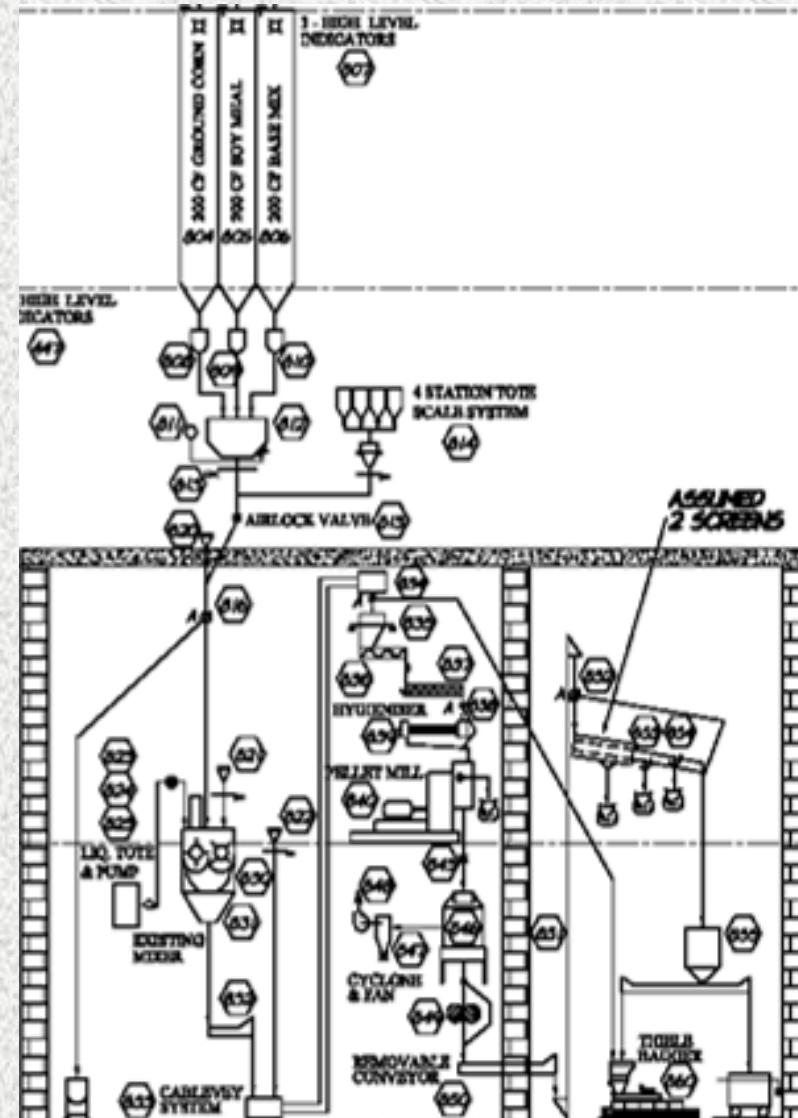
- Feed processing technologies to sterilize feed and lower bacterial/viral introduction to livestock operations and the food chain
- Application of nano-scale processing methods to yield products with superior nutritional characteristics or unique biological activities
- Energy efficient methods of agglomeration to produce pellets, blocks or extrudates
- Identification of manufacturing processes or dietary supplements that enhance meat quality, tenderness or chemical composition
- Fractionation of byproducts to isolate high-value components with nutriceutical applications
- Pretreatment of co-product streams through enzymatic hydrolysis or other biological treatments to improve digestibility

Planned Research Efforts in New Feed Mill – Future Industry Impact

- Altering physical form of feeds to facilitate ease of handling and labor reduction for end users
- Development of cost-effective encapsulation strategies that target site-specific delivery of nutrients or pharmaceutical compounds within the gastrointestinal tract
- Cold gelatinization (low energy input) of starch to enhance digestion
- Identification and isolation of novel plant extracts with desirable biological activities
- Development of new strategies to enhance nutrient bypass in ruminant feeds
- Development of new strategies to control/reduce shrink in feed processing and ingredient utilization

Feed Safety Research Center

- BSL-2 is “Bio-Safety Level 2”
- Designed to conduct specific studies with low virulence pathogens (i.e., *Salmonella*) to address current food/feed safety issues the feed industry is facing
- Utilized also for normal teaching and research activities
- “With the new mill just across the street from NBAF, K-State can provide specialty livestock diets to support infectious disease experiments, oral vaccine studies and other trials under high level bio-safety controlled conditions. ***This work cannot be done anywhere else in the U.S.***” – Dr. Kirk Schulz, K-State President



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Industry Impact through Outreach

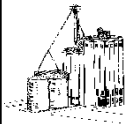
Feed Short Courses:

- Implementing HACCP in Feed Manufacturing
- Improving Feed Manufacturing Efficiency
- Fundamentals of Feed Manufacturing
- Advanced Pelleting Concepts
- Grain Quality Preservation
- Feed Mill Management
- Feed Mill Maintenance
- Risk Management

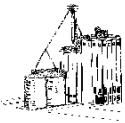
Research is the foundation for domestic & international outreach!!!




Principles of Feed Manufacturing Short Course
June 10-13, 2008
Presented by Kansas State University, the American Feed Industry Association and the National Grain and Feed Association



Advanced Pelleting Concepts
July 10-13, 2007
Presented by Kansas State University, the American Feed Industry Association and the National Grain and Feed Association



ADVANCED FEED MILL MANAGEMENT
April 8-11, 2008
Kansas State University Feed Manufacturing Short Course
Presented in cooperation with the American Feed Industry Association, the National Grain and Feed Association, and the International Grains Program



FEED MILL MAINTENANCE
June 2-5, 2009
Kansas State University Feed Manufacturing Short Course
Presented in cooperation with the American Feed Industry Association, the National Grain and Feed Association, and the International Grains Program

Background
The Department of Grain Science and Industry at Kansas State University, in partnership with industry associations, has held Feed Manufacturing Short Courses since 1976. These courses are taught by a unique blend of individuals from Kansas State University and within the feed and allied industries and provide in-depth training on all aspects associated with feed manufacturing.

Who Should Attend
This course is designed for feed mill maintenance managers, shift supervisors, and feed mill managers.

Location and Registration Information
The course will be held at Kansas State University in Manhattan, Kansas. The registration fee for this course is \$800. This includes short course handout materials, all lunches, refreshments, and one dinner. Feed Manufacturing Technology V will be available for purchase at a reduced rate.

For registration information, contact:
Anita McDiffett
Dept. of Grain Science & Industry
Kansas State University
201 Shellenberger Hall
Manhattan KS 66506-2201
Phone: 785-532-4080
E-mail: ajmc@ksu.edu

Hotel Accommodations and Short Course Location
Room block reserved until May 2, 2009, at:
Holiday Inn at the Campus
1641 Anderson Avenue
Manhattan KS 66502
Phone: 785-539-7531
Fax: 785-539-3909
Mention that you are with the KSU Feed Mill Maintenance Short Course to receive a reduced room rate.

Additional Information
Class size is limited so register early. The course is subject to cancellation if there are less than 15 enrollments. Kansas State University is dedicated to making short courses accessible to all persons. To increase our ability to assist you in finding necessary services or if you have a dietary preference, please indicate this when registering.

Tentative Schedule

June 2

- Registration
- Dinner

June 3

- The Importance of Having an Effective Maintenance Program
- Establishing a Preventative Maintenance Program
- Maintenance Safety
- Parts Purchasing and Inventory Management
- Magnets – Design, Testing, and Installation
- Motor Bearing Maintenance

June 4

- Electrical Maintenance
- Dust Filter Maintenance
- Conveyor Maintenance
- Liquid Pump Maintenance
- Maintenance of Compressed Air Systems
- Maintenance of Hammer Mills and Roller Mills
- Batching Systems and Mixer Maintenance

June 5

- Boiler and Steam System Maintenance
- Pellet Mill Maintenance
- Pellet Cooler Maintenance

Feed Manufacturing Short Courses

- 37 international & domestic short courses
 - with over 850 participants
 - from more than **20 countries** in last 5 years



**ASA-IM Turkish
Feed Manufacturing
Short Course
Participants (S10)**

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NBAF will be built in Manhattan, KS

Kansas State, Manhattan Campus



Biosecurity Research Institute

School of Veterinary Medicine and Sciences



Department of Animal Science and Industry



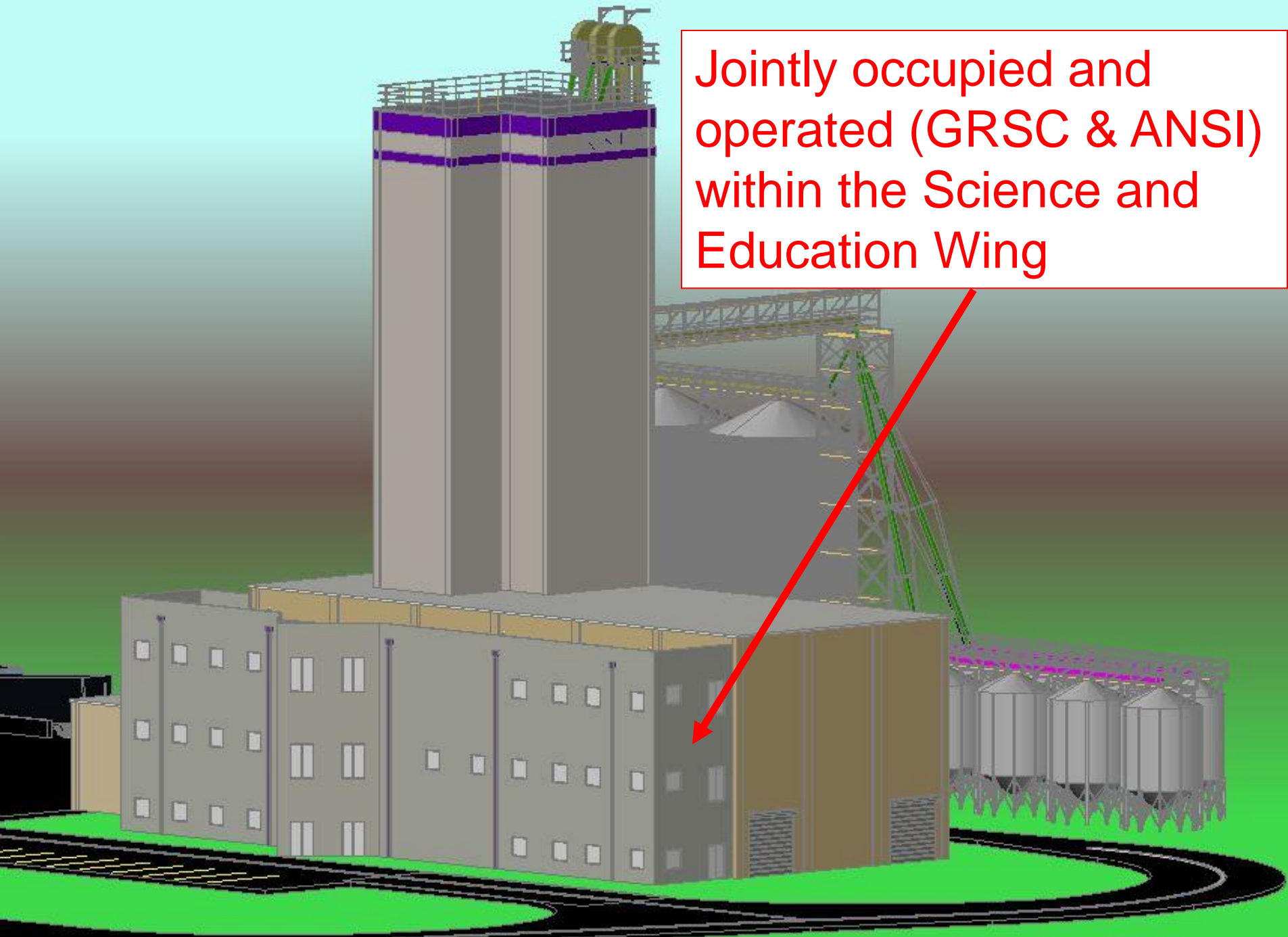
- Manhattan, Kansas selected as site for NBAF after an extensive 3-year site selection process that included a thorough risk assessment, environmental impact assessment and security assessment
- Located in proximity to research of NBAF-related missions in veterinary, agriculture, and bio-security research expertise and resources
- Located in proximity to a major hub of the veterinary pharmaceutical industry
- Located in proximity to the Biosecurity Research Institute, School of Veterinary Medicine and Sciences, College of Agriculture, and the Department of Animal Science & Industry , **and the new Feed Mill & Biorefinery Facility**
- Strong community support from key stakeholders



Defending America Against Foreign Animal Diseases

Vaccines • Diagnostics • Countermeasures

Jointly occupied and operated (GRSC & ANSI) within the Science and Education Wing



Progress and Estimated Timeline

- Estimated \$13 million project
 - \$2 million lead gift by Mr. Ron Kruse
 - \$0.3 million cash from grain, feed and biofuels industry so far
 - plus >\$2 million in equipment commitments
 - University has committed \$5.2 million in NBAF relocation funds from State of Kansas
 - Seeking additional \$3-3.5 million cash and equipment



Project Timeline:

Fall 2010 – break ground & complete fund raising

Jan 2012 – dedication & commissioning of new facility

Needed Industry Support

- A tremendous amount of effort has been put into designing flexibility & functionality into the facility, for teaching, research, outreach, and to better serve the needs of the feed/livestock/poultry industries
- Today's goal: What modifications/additions can be made to the facility in order to better serve the Liquid Feeds Industry?

Needed Industry Support

- Currently the facility is designed with:
 - Liquid tanks - molasses, fat, CSL, etc...
 - 1000 lb/batch capacity blending unit
- Where can this industry help
 - Design/Capabilities suggestions
 - Equipment donations
 - Cash donations (naming opportunities)

Contact Information

Leland McKinney

Tel: 785-532-4082

Email: lelandm@ksu.edu

Keith Behnke

Tel: 785-532-4083

Email: kbfeed@ksu.edu

The NEW K-State Feed Mill & Biorefinery Teaching & Research Facility will provide the industry:



- State-of-the-art facilities to educate & train next generation students and industry professionals
- Expanded capabilities to...
 - conduct practical & beneficial feed processing / animal nutrition research
 - evaluate novel products and processes
- One-of-a-kind capabilities to conduct industry-critical food/feed safety research
- Greatly expanded access to impactful outreach programs

New Feed Mill – A K-State Priority

“The new feed mill and biorefinery complex is one of K-State’s top priorities. With close to half of the necessary funding already raised or committed, we are enthusiastic about the new facilities which will **benefit industry as well as our students.”**

**- Dr. Kirk Schulz, President,
Kansas State University**

