

ISU Feed Mill and Grain Science Complex: Notes on the Beginnings

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Introduction

Several factors came together encouraging ISU to pursue a new centralized feed mill capital project including:

- In the late 1990s, as livestock operations in the U.S. Cornbelt became larger and more integrated, the livestock feed industry became more specialized and more focused on serving large volume segments of the livestock industry. In this scenario, it became more challenging for the ISU livestock research and teaching farms to competitively bid and acquire feed for the university's diverse livestock and poultry.
- At the same time, the decentralized feed milling operations on ISU farms were outdated and in need of replacement. The mills dated from the 1950s to 1980s.
- Feed milling technology and the complexity of rations increased, requiring higher precision technology.
- The Iowa feed industry grew not only more specialized, but into one of the nation's largest with a strong need for more highly trained feed mill managers and professionals.
- The array of new feed ingredients from the growing bioenergy sector was increasing rapidly.
- Interest by the feed industry as donors (both financial and in-kind milling and grain storage/handling equipment) was strong.
- Interest in feed biosecurity and feed as a vector of animal disease was on the rise,

encouraged by the world-wide avian flu outbreak and other livestock diseases globally.

- The initial boom in ethanol production had cooled, lessening the demand for corn.
- Grain exports contracted as world trade disruptions became more common.
- Grain industry leaders looked to the traditional markets for grain and soy meal—domestic livestock feeding—to support corn and soybean use and prices.
- The baby boom generation began retiring, taking decades of feed milling expertise out of the industry.

All of these factors converged and helped propel College of Agriculture and Life Sciences (CALs) to launch a new capital project – the ISU Feed Mill and Grain Science Complex. The purpose of this article is to record the authors' impressions of this project.

Beginnings

About 2015, leadership in the departments of animal science and agricultural and biosystems engineering began multiple conversations with the CALs Dean. This led to discussions with industry, commodity, and agribusiness groups. One of the key turning points came when the Dean mentioned the concept in a briefing to the Iowa Corn Growers Association leaders. The response was so positive, it helped move the feed mill project from conceptual to the funding and planning phase.

Funding the feed mill capital project was almost entirely from donations. ISU Foundation CALs development team recruited major donors including Kent Corporation, Sukup Manufacturing, Iowa Corn Growers Association, CPM, and others.

A comprehensive planning committee of CALs faculty, staff, and administrators was

assembled and was chaired by an associate dean plus representatives of ISU Facilities, Planning, and Management. The committee worked diligently with weekly meetings over a significant period. Program details such as mill capacity, major equipment capacities, pilot-scale plant needs, biosecurity considerations, material flows, specifications of the educational areas, equipment donations, and many other considerations were decided. Curry-Wille Associates, Ames, Iowa, assisted the committee. The process lasted several years and in that time departmental, college, and university leadership changed. The capital project continued thanks to the leadership of many.

Mission Statement

The planning committee developed a mission statement with specific priorities in 2018 as follows:

The ISU Feed Mill and Grain Science Complex, a state-of-the-art facility, will focus on furthering the university's mission of teaching, research, service, and extension while producing feeds for ISU livestock and poultry teaching and research farms.

The priorities for the complex will be:

- **To enhance ISU teaching programs related to feed technology, grain science, and animal nutrition.**
 - Facilities will be used in teaching programs including courses in the departments of agricultural and biosystems engineering and animal science, plus associated departments across CALS.
 - Students will benefit from hands-on experiences with a working feed mill and grain handling facility.
- **To provide programming opportunities for ISU Extension and Outreach, related to feed technology, grain science, and animal nutrition training and continuing education.**

- Facilities will be used in extension and outreach programs for domestic and international grain, feed, and animal industry professionals.
- **To support ISU animal, feed, and grain research programs.**
 - Facilities will be used for research purposes relevant to the U.S. feed and grains sector.
 - Facilities will be used for processing of specialized feed and ingredients for use in animal nutrition research.
- **To manufacture diets and feeds for CALS animal teaching and research facilities.**
 - In addition to meeting CALS' diets and feeds needs, facilities also may be used to make specialized contract feeds for private industry and other external partners that may be unavailable or hard to acquire.

It is the overarching goal that all of these priorities be met by the facilities and staff of the complex. **The feed mill and grain science complex will be managed by the college with purposeful engagement by a faculty user advisory committee from the college.**

Approved, April 2018.

Timeline

Table 1 shows the general timeline of the feed mill's beginnings from 2015 to early 2021. The construction contract was awarded to Todd & Sargent, Ames, Iowa, for a slip form concrete mill tower in 2020. The official name of the complex is the ISU Kent Corporation Feed Mill and Grain Science Complex. Construction began fall 2020 and is expected to be complete and operational summer 2022.

Location

The mill and bins were sited at the ISU Curtiss Farm at the corner of State Avenue and U.S. Highway 30 after several sites were

considered. Proximity to campus and visibility were key criteria.

Scope

The mill was designed to meet the needs of the ISU livestock classes: swine, beef cattle, dairy cattle, sheep, horses, and poultry (layers, broilers, and turkeys). The original construction budget was \$21.2 million and the revised budget was \$24.2 million.

Capabilities and capacities. The feed mill will have physical capacity of about 20,000 tons/year at about 10 tons/hour. Iowa State expects the mill’s feed output will be somewhat less when coupled with the critical functions of conducting classes, short courses or tours, developing research diets/small batches, and fulfilling rations for seven classes of livestock at teaching and research farms.

Feed Mill

- 21 ingredient bins, from 7.5 to 30 tons
- Separate truck dumps for grain and ingredients
- 12 three-ton loadout bins
- Tote system
- Micro-ingredient system
- Eight 12-ton dedicated loadout bins

- Pellet mills (1 and 5 TPH)
- Mixer (1 and 3 ton)
- 10 TPH hammer and roller mills
- Automated mixing and monitoring systems
- Automated sampling probe for incoming loads
- An estimated 2,700 batches annually

Grain Science

- Approximately 160,000 bushels whole grain storage
- Approximately 20,000 bushels drying/aeration bin
- Dryer 2,127 bushels/hour @ 5 points
- 4,000 bushels/hour grain handling

Warehouse and Educational Area

- Ingredient and complete feed storage
- Cold storage for long-term samples
- Pilot-scale research area
- Biosecurity entrance
- One 40-seat classroom
- Sampling and analysis area

Note: The exact specifications of the mill may change after this article was written.

Table 1. Feed mill timeline.

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| | 2015 | Conversations |
| | 2016 | CALS Dean briefing to Iowa Corn Growers |
| November | 2016 | Site selected |
| | 2017 | Major gifts secured: Iowa Corn, Kent, Sukup |
| August | 2017 | Neighborhood meeting |
| September | 2017 | Gift announcement event at ISU Memorial Union |
| November | 2017 | Design/planning committee formed |
| February | 2018 | Project Initiation Request filed |
| April | 2018 | Capital project approval |
| April | 2018 | Mission statement finalized |
| September | 2018 | CPM selected as a major equipment partner |
| | 2018 | Board of Regents approval |
| September | 2019 | Formal groundbreaking at ISU Curtiss Farm |
| September | 2020 | Board of Regents approves increase in budget |
| September | 2020 | Todd & Sargent and Opus granted contract |
| December | 2020 | Dirtwork started |
| March | 2021 | Tony Ewing starts as feed mill manager |
| April | 2021 | Dirk Maier named complex director |