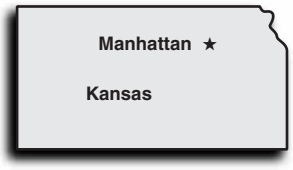
New Possibilities

O.H. KRUSE FEED TECHNOLOGY INNOVATION CENTER UP AND RUNNING

K-State's new O.H. Kruse Feed Technology Innovation Center in Manhattan, KS began operations in July and was dedicated Oct. 11, 2013. Photos by Alex Lord.

Kansas State University's (K-State) feed mill in Shellenberger Hall has served as the main facility for teaching and test feed runs for over 40 years. On Oct. 11, its replacement, the O.H. Kruse Feed Technology Innovation Center, was dedicated, after the old mill had long outlived its useful life, according to Keith Behnke, professor emeritus of grain science and industry at K-State.



"At the old mill, students maybe made 500 tons of feed in a year," Behnke says. "With the new mill, we expect to be able to produce 5,000 tons of feed per year."

A lead gift of $2 million was made in October 2007 by the Kruse family, Goshen, CA, in honor of company founder Otto H. Kruse, for whom the facility is named.

The university made the decision to combine feed-related activities of the Departments of Grain Science and Industry (800-355-5531) and Animal Sciences with the construction of the new mill that will serve the teaching, research, and outreach needs of both departments. According to Charles Stark, professor of feed technology and director of the mill, this will allow stu-

Keith Behnke, emeritus professor, and Charles Stark, feed technology professor, both of the K-State Department of Grain Science and Industry.

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RMS roller mill.

dents from both departments to become future leaders in the feed industry. The new mill currently is making feed for the swine, dairy, and poultry farms at K-State.

Stark, a graduate of animal science (B.S.), and grain science (M.S. and Ph.D.) departments at K-State, says that the new mill is far more advanced than what he worked with as a student.

"Students will get the opportunity to work in a commercial-size mill with equipment and technology that is in mills they will be placed in after graduation," Stark says.

Back to K-State

Upon graduating from K-State with a Ph.D. in grain science, Stark worked in the feed industry for 12 years, with responsibilities in feed manufacturing, quality assurance, and plant operations. He then found his way back into academia, when he joined North Carolina State University at its startup mill in 2006.

At K-State, Stark has a dual appointment in education and research and with the International Grains Program. He will work 75% of the time with the grain science department and 25% of the time with the animal science department.

Stark's experience with the North Carolina State startup mill is one of the reasons he was asked to come to K-State, Behnke says. "Because Stark had experience with a new mill at another university, he was our top candidate," he says.

Student Shifts

Feed manufacturing at the O.H. Kruse Feed Technology Innovation Center will be split between student labs, research, campus farm feed manufacturing, and running test feeds for outside companies. One to 1-1/2 days a week will be spent working with three student labs.

CPM pellet mill with conditioner.

When student labs are not in session, the mill will be run by three shifts of students, Stark says.

"The mill will be run by a manager and student employees," he says. "We will have three student shift leaders responsible for maintenance, quality assurance, and housekeeping."

Feed Safety

One unique feature of the mill is the Cargill Center for Feed Safety Research. The center, partially funded by a $500,000 grant from Cargill, is attached to the main mill but can be sealed and has a separate air system from the main mill tower.

"The center is designed so researchers can work with food-borne pathogens," Behnke says. "The center's planned research efforts include feed processing technologies to reduce bacterial/viral introduction to animal food livestock operations and the food chain."

For decontamination purposes, the center can be heated to 140 degrees and held at that temperature for 24 hours.

Mill Features

The general contractor on the project was McCownGordon Construction, LLC (816-960-1111), Kansas City, MO and ASI Industrial, Billings, MT (406-245-6231), was the feed mill contractor.

The main mill tower is a slipform concrete structure standing 142 feet tall on a 36-foot-x-43-foot footprint. The tower holds 18 ingredient bins with a total capacity of 500 tons, two mash feed pre-pelleting bins holding 33 tons, and eight finished feed bins holding 80 tons. An attached pelleting annex is 16 feet wide by 43 feet long.

Incoming grain trucks are weighed on an 80-foot Cardinal dump-through pit-type ARMOR® scale that can unload a 25-ton truck in 30 minutes. The scale pit feeds a SCAFCO 5,000-bph leg equipped with 9x6 Maxi-Lift CC-MAX buckets, customized in K-State's purple school color. The leg deposits grain into a SCAFCO 20,000-bushel corrugated hopper tank. Future plans call for installing four 2,500-bushel and four 1,000-bushel SCAFCO hopper tanks.

Corn that needs cleaning is run through a Carter Day in-line screener, before continuing on to an 8-tph Bliss hammermill or 8-tph RMS roller mill.

Batch ingredients are assembled in an ASI Industrial 1-ton batching scale equipped with Venture Measurement load cells. Microingredients can be added from a 12-bin Intersystems microingredient system, with a total capacity of 4,000 lbs. From there, feed is mixed either in a 1-ton Hayes & Stolz twin-rotor mixer or a 1,000-lb. Scott twin-rotor mixer. Both mixers are equipped with manifolds for adding fat or molasses.

Mash feed destined for pelleting is sent to a 5-tph CPM Model 3016-4 pellet mill. From there, pellets run through an APEC pellet-coating system, a 5-tph Bliss counterflow pellet cooler, and either a CPM feed cleaner or a 20-tph EBM Gentle Roll cleaner.

Bulk feed is loaded through a telescoping spout onto a university-owned feed truck that makes deliveries to K-State animal units. Alternatively, feed can be bagged on a JEM bagging system.

Alex Lord, associate editor

A complete list of all of the equipment that was donated for the mill is available on page 168. ►

Maxi-Lift CC-MAX buckets, customized in K-State purple. Photo by Briana Jacobus, IGP.

Equipment Donors and Suppliers

The following companies either donated or provided the listed equipment below at a reduced cost for the O.H. Kruse Feed Technology Innovation Center.

Companies	Equipment
APEC USA	Pellet coating system
ASI Industrial	Feed mill contractor, batching scale
BS&B Pressure Safety Management, LLC	Explosion suppressant systems
Bliss Industries, LLC	Hammermill, air assist system, pellet coolers
Bunting Magnetics Co.	Magnetic separation equipment
Cardinal Scale Mfg. Co.	Truck scale
CMC Industrial Electronics	Safety monitoring devices
California Pellet Mill Corp.	Pellet mill w/ conditioner, dies, VFD, feed cleaner, and crumbler
EBM Manufacturing, Inc.	Gentle Roll screener with Sidewinder conveyor
Evonik Industries	NIR instrument
Feed Energy Company	Liquid storage tanks
Foss North America	NIR analyzer
Hayes & Stolz Ind. Mfg. Co., LLC.	Mixer, surge bin, drag conveyors, and spouting distributors
Hutchinson-Mayrath / A Division of Global Industries, Inc.	Screw and drag conveyors
Interstates Control Systems, Inc.	Automation system software and installation
Intersystems	Microingredient system and drag conveyors
JEM International/ Express Scale Parts	Bagging systems
KC Supply Co., Inc.	Inspection doors
Kice Industries, Inc.	Cyclone collectors, filters, airlocks, and fans
Law-Marot-Milpro	Double distributor
The Lakeland Companies, Control Assemblies Co.	FSRC automation system
Maljohn Company Ltd.	Telescoping truck spout
Maxi-Lift, Inc./Southwest AgriPlastics	Elevator buckets
OPIsystems Inc.	Grain bin temperature monitoring and fan controls
Pepper Maintenance Systems, Inc.	Equipment alignment/balancing
Power Flame, Inc.	Burner for boiler
RCI Safety	Safety training & monitoring software
RMS Roller Mill Co.	Roller mill
Scott Equipment Corp.	Mixer, surge, and drag
SCAFCO Grain Systems Co.	Grain bins, bucket elevator, conveyors, tower, and catwalks
Screw Conveyor Corporation	Screw conveyors and feeders
Seedburo Equipment Co.	Laboratory equipment
Sentry Equipment Corp.	Sampling equipment
Superior Boiler Works	Boiler
Tramco, Inc.	Drag conveyors
Union Special, LLC	Bag closing systems
Vortex Valves	Gates, valves, and diverters
Venture Measurement	Level controls, load cells
Vibco, Inc.	Vibrators
Wenger Manufacturing	HIP conditioning system
Younglove Construction, L.L.C.	Support in designing facility