

TECHNOLOGY • NUTRITION • MARKETING

# FEED management

[www.feedindustrynetwork.com](http://www.feedindustrynetwork.com)

**JANUARY/FEBRUARY 2006**  
**A WATT FEED PUBLICATION**

---

*Horses: TMRs and fish oil*

---

*Detailing drag conveyors*

---

*Plant manager survey results*

---



*Training*  
for a competitive career

Learning  
by doing  
at Cal Poly

**PRODUCT SHOWCASE 2006**

Animal science students Alie Reilly (left) and Missy Porter, working Cal Poly cattle at the Equine Center. Photo compliments of Wendy Hall, Cal Poly.



# Cal Poly

## *Learning feed by doing feed*

---

**BY CLAYTON GILL**

Cal Poly—aka “California Polytechnic State University” in San Luis Obispo—boasts the fourth largest undergraduate agriculture program in the USA and the fifth largest animal science program. However, this 18,000-student university—small by Golden State standards—is not the state’s Land Grant university. The University of California at Davis holds that title and attracts the bulk of the state and federal ag research dollars. Cal Poly manages an extensive research program, too, but one that focuses on practical applica-

tions. At San Luis Obispo, hands get dirty in ag science. For animal science majors, Cal Poly’s “learn by doing” educational experience includes learning about feed manufacturing.

The university’s new feed plant—a modular design from T.E. Ibberson Company—will replace a 50-year-old mill in the middle of campus. The new training and research facility is scheduled to come online in 2006 as part of a \$14 million relocation of Cal Poly’s animal and meat science facilities. Cal Poly’s animal and meat science students may joke about “gentrification” of their old

neighborhood—the new student apartment complex will cost an estimated \$250 million, located only minutes from California’s Central Coast beaches.

Rezoning prime real estate from ‘ag’ to ‘residential’ is nothing new, especially in California. But, what does it take to get a new \$5 million feed plant in the bargain?

FEED MANAGEMENT asked Professor Andrew Thulin, head of Cal Poly’s animal science department and prime mover behind the new facility. Dr Thulin obtained his bachelor’s degree in animal science from Cal Poly and his master’s and doc-

torate degrees in nonruminant nutrition from Kansas State University. He went on to become a professor and the swine extension leader at Michigan State University. However, Dr Thulin's career then took a curve into industry as he became a manager in Cargill Inc's Animal Division, directing deployment of nutrition and production technologies and business management in the USA and 14 other countries. In 1998, that extraordinary global animal and feed industry experience gave him a unique perspective when he was recruited to join Cal Poly.

**FM:** *Consumer media portray California state finances as highly leveraged and often on the verge of collapse. Yet the current Cal Poly projects are 'big ticket' items. How can the state spend for a new feed mill?*

**Dr Andrew Thulin:** California has the sixth largest economy in the world, and it is rebounding as we speak. State government is committed to agriculture, as California agriculture continues to be the major supplier of food products for the entire USA. That is not just fruit, nuts, and wine. For example, California is the top dairy state, as well. In 2003, California gross producer income for milk was over \$4.0 billion.

At Cal Poly, we focus on applied research and have received strong state support through the Agricultural Research Initiative (ARI), which was set up by the California legislature to support applied research in agriculture (see <http://ari.calpoly.edu/>). While UC-Davis focuses on basic research, Cal Poly focuses on producing young ag leaders who are prepared to go immediately into industry following graduation, and add value to organizations without having to spend two years in training. The reason we will conduct feed manufacturing teaching and research is that there is a great need and few places to conduct research, and the industry is in great need of young people to fill their



**Planning for relocation and expansion of the new feed plant at Cal Poly, Buster Freeman (student in the Bioresource and Ag Engineering Department, left) and Casey Callaghan (student manager of the Animal Nutrition Center) 'learn by doing' alongside Dr Andrew Thulin (professor and head of the Animal Science Department). Photo compliments of Wendy Hall, Cal Poly.**

management teams.

The State of California is providing \$8 million toward the \$12-14 million Cal Poly animal and meat campus relocation, which includes the new feed mill. The state funding is coming from the California State University Housing Fund, which comes from bonds issued over the years to support student housing. This money is separate from the state's operating fund. The total Poly Canyon Village complex has been budgeted at \$239 million.

We project our costs at \$3.0 million for the Beef Center, \$1.0 million for the Beef Cattle Evaluation Center, \$4.5 million for the Meat Processing Center, and \$5.0 million for the Animal Nutrition Center, which includes the new feed mill. For the feed mill, we secured \$2.0 million from the state, plus a total of \$1.3 million from the recent California methionine price-fixing class action settlement. We're seeking additional funds through grants and industry donations, as we partner with members of the California Grain and Feed Association. Also, we're getting extraordinary support from feed industry suppliers, including donations of equipment and design and engineering services.

**FM:** *How did Cal Poly manage to*

*benefit from the methionine class-action suit?*

**Dr Thulin:** We were contacted by the law firm to discuss our animal nutrition program, as the plaintiffs wanted to provide \$500,000 to support an animal nutrition program in California. Only Cal Poly followed up and submitted a proposal. Our proposal outlined the Cal Poly Animal Science program and what we would do with the settlement money if we got it.

Our initial proposal was approved in June last year. Then we learned that many companies which were eligible to receive funds had failed to request them, so the remaining funds were allocated to Cal Poly.

**FM:** *How will the new feed plant fit in with Cal Poly's animal science program?*

**Dr Thulin:** The new feed mill will accommodate poultry, swine, and equine feed products at one end, and just outside the mill at the opposite end of the building, we'll make products for dairy and beef cattle separately. The ruminant feeds will be manufactured in a stationary mixing system, and the volume produced will be significantly greater than that produced for the nonruminants.

I want our students to understand how feed processing systems operate. For students who have never been in a feed mill before, our modular plant may be less intimidating versus teaching them in a very large, older commercial mill. We also take our students to large commercial mills as part of their training in our animal nutrition courses. But at the end of the day, I would like our students to be *exposed* to the feed industry, whether or not they go into the industry.

**FM:** *What design objectives did you have in mind for the new feed plant?*

**Dr Thulin:** At a minimum, the new mill has to replace and upgrade the existing feed mill. It has to provide hands-on student training for feed manufacturing.

In sequence, views showing modular feed plant fabrication and erection of the FilAm plant now operating in Capas in the Philippines: Fit-up assembly of the feed plant modules in Ibberson's fabrication shop; setting first module on the foundation; nearing completion of module setting after first week of erection; and, detail of pre-piping of the pellet mill steam harness.



It has to run industrial-grade equipment, just like larger commercial feed plants. However, besides manufacturing feed for university livestock, it also has to manufacture specialty diets for animal research. So, the new mill has to incorporate easy product change-over.

The new mill would also serve as a testing facility for companies involved in biotechnology research with enzymes, probiotics, and other ingredients, including studies of HACCP processes.

We envisioned Cal Poly's new feed mill as an 'introduction' to the feed industry of today and tomorrow for students and future feed industry employees. They would have experience in a modern processing facility at a high quality location, through class work and short courses. We also focused on Asia and want to provide a preferred site for international training and industry exposure, which we already provide through Cal Poly's dairy and food processing short courses.

## Cal Poly's 50-year-old feed mill is giving way to student housing, but will be reborn as a \$5 million modular feed plant.

**FM:** *Why choose a modular feed plant? What were the design considerations? For example, speed of construction? Ease of equipment upgrading? Ease of equipment access? Flexibility in equipment trade-outs?*

**Dr Thulin:** All of the above! The modular approach offers great speed and convenience of construction, which helps reduce the amount of on-site "prevailing wage" labor going into the project. Another reason we chose to go the modular route was my experience while at Cargill.

In Asia, we had two of these modular mills, which were quick to set up and allow entry into a new market. They are likely to be used throughout the world as the feed industry develops in more remote areas.

**FM:** *Modular plants may tend to be less energy efficient on a per-ton basis because more material must be transported horizontally and less can be moved vertically by gravity. What was the thinking in terms of cost-efficiency to build versus to operate?*

**Dr Thulin:** Keep in mind that while the mill will serve the University's feed production requirements for poultry, swine, cattle, and horses, Cal Poly also conducts contract research, which tends to require many small batches. There will be considerable product change-over, so we never will be as efficient as a regular

commercial mill. The design and size of the modular mill are consistent with our needs.

I believe the stationary mixing system for the ruminant feeds will be something special. Several consulting nutritionists have encouraged us to conduct mixing efficiency tests on mixing systems for ruminant feeds, especially for the dairy industry. Also, we hope to position our program to move next into support for the pet-food industry.

We are not a Land Grant school, so our contract research is not required to be published. A company can test various technologies and not be concerned about release of proprietary data.

**FM:** *Californians often provide impetus for food safety issues. Will feed-food safety education and training be a major goal of the new facility?*

**Dr Thulin:** I believe it must be. The organic and natural brands are the fastest growing markets, and consumers will drive these markets to be accountable for the products they sell. Very soon, your HACCP program will begin at the birth of the animal and continue throughout the value chain to the final product that delivers a pleasurable dining experience. Consumers will pay a lot of money

to have the perceived comfort that their meat products are safe. Of course, RFID (radio frequency identification) technology will be included as part of the entire process, just as it is beginning to be driven by the Walmarts and Costcos in the vegetable industry.

The new mill offers an opportunity to showcase equipment, systems, and processes to the California feed industry. Besides showing students how modern feeds

are made, as we evolve we will begin to host training programs with our industry partners, including programs for international participants. I believe there can be real synergies with our program and industry stakeholders. **FM**

*For more information: Dr Andrew Thulin, Animal Science Department, Cal Poly State University, San Luis Obispo, CA 93407, tel +1 805 756 2619, fax +1 805 756 7403, athulin@calpoly.edu, <http://cagr.calpoly.edu/>.*

### CalPoly feed equipment

Major equipment	Supplier
Roller mill	CPM/Roskamp Champion
Hammer mill	CPM/Roskamp Champion
Mixer	Scott Equipment Company
Pellet mill with two-pass conditioner	California Pellet Mill Company
Counterflow pellet cooler	California Pellet Mill Company
Pellet crumbler	CPM/Roskamp Champion
Pellet screener	Rotex
Bagging line	Thiele Technologies
Liquid blender	APEC
Impact scale	Eastern Instruments
Steam generator	Clayton Industries
Truck scale	Cardinal
Controls	Interstates Control Systems
Conveyors, bucket elevators	Essmueller
Screw feeders	Screw Conveyor Corporation
Magnets	Magnetic Products



**Global turnkey plant builder T.E. Ibberson designed the new Cal Poly feed mill and is currently fabricating modules and will begin erection later this year. The Cal Poly plant will resemble a modular mill built by Ibberson for FilAm Foods at Capas in the Philippines, shown in this photo, although the Cal Poly plant will be smaller. The FilAm plant was designed for 20 metric tons per hour and expanded to 40 mtpH, whereas the Cal Poly design calls for 10 tons per hour mash production and 5 tPH pelleted production. Ibberson's Gerry Leukam says the project will take less than 12 months from "unconditional notice to proceed to completion of start-up."**



***[www.animalscience.calpoly.edu](http://www.animalscience.calpoly.edu)***

*Visit the Animal Science Department's Web site!  
You can find the latest information on the facilities relocation project as well as copies of previous newsletters and other published works.*

*For more information:  
Dr. Andrew Thulin  
Animal Science Department  
Cal Poly State University  
San Luis Obispo, CA 93407  
tel +1-805-756-2619,  
fax +1-805-756-7403, [athulin@calpoly.edu](mailto:athulin@calpoly.edu),  
<http://cagr.calpoly.edu/>.*

