From pasture to profit

By Ashley Carroll, Marlow, Okla.

From a backyard necessity to a convenience-store luxury, beef jerky has been a mainstay in Oklahoma for more than 100 years. Through it all, technology and research have played a role in developing a product Americans have come to love.

Now, Oklahoma State University is developing a way for small-business owners to produce their own beef jerky efficiently and economically.

"The Food and Agricultural Products Research and Technology Center is committed to helping Oklahoma's food processors solve their problems while achieving competitive results," said Tim Bowser, associate professor of biosystems engineering and FAPC food processing engineer.

In January 2006, FAPC received a U.S. Department of Agriculture Cooperative Agreement Grant for $28,500 to assist small meat processors. Since then, they have conducted research and tests to develop an inexpensive, reliable and simple dehydrator and a drying process that will help small meat processors produce safer and higher-quality jerky products.

"Our goal with this grant is to meet the needs of small meat processors in the state and provide the science to back it up," Bowser said.

Bowser said the beef jerky business is a growing industry in Oklahoma and around the country, but it can be difficult for small meat processors to get their foot in the door. All processors must purchase, build or obtain a meat dehydrator or dryer, and the options for small processors are limited due to budget constraints.

"Most dehydrators can cost anywhere from $80,000 to $100,000, making it hard for a business to get started," Bowser said. "Many commercially available dehydrators are either too small or too large to meet the needs of the very small meat processor."

In recent years, some small processors have attempted to build their own dryers to help meet their financial constraints, Bowser said.

"The only problem with homemade dehydrators is they tend to be difficult to clean and maintain and are more likely to produce unsafe food products," Bowser said.

Observers tour FAPC and see the new beef jerky dehydrator. (Photo by Todd Johnson)

For this reason, FAPC is committed to constructing a safer, more efficient dehydrator, he said.

The construction of the dehydrator will require no special skills from the processor, except a familiarity with common construction materials and techniques. Processors must read a simple blueprint and follow written instructions, Bowser said.

"The building materials for the dehydrator are off-the-shelf items from local hardware stores and mail-order industrial and restaurant suppliers," Bowser said. "The beef jerky dehydrator is highly beneficial to small meat processors because it is a low-cost unit the processors can assemble. It is a clever use of existing materials and equipment that meets the needs of the processor and USDA requirements."

To help small processors find something more efficient, students have played a major role in developing, researching and implementing the new dehydrator, Bowser said.

Brady Stewart, biosystems engineering senior with a food processing option, began working on the project as a research assistant in April 2006. Stewart said he always was interested in the food industry and said the project is a great way to gain experience on campus while going to school.

"The grant is a great way to help small jerky processors get a technological advantage over their competitors," Stewart said. "It is a cost-effective way to help them get to the top of their game within the industry."

Using probes, Stewart performs temperature and relative humidity tests throughout the oven chamber during the jerky processing. He also tests the internal temperature of the jerky to ensure the oven is cooking at an even rate.

"All areas in the dehydrator must have the same rate of drying and the same temperature to dehydrate the meat evenly," Stewart said.

"If the temperature and humidity are not correct, it causes the meat to dehydrate unevenly," he said.

Bowser said not only must the

dehydrator cook the jerky evenly, but also the product must meet USDA food safety standards. Researchers performed studies in triplicate replications and collected data to ensure the dehydrator met USDA requirements.

Stewart is involved in preparing a set of blueprints, a parts list and a construction guide for the dryer. He also is writing an operator manual for the dryer that includes cleanup, sanitation and maintenance instructions.

"The goal is to have an instruction manual available to processors so they can assemble the dehydrator for around $7,500," Stewart said. "In the next couple of months, printed material will be available so processors can download it from the Internet or receive it in the mail."

With all the researching, testing, implementing and re-testing, Bowser and Stewart both said it is rewarding to know they are helping someone succeed within his or her industry.

"It is a great experience to help small-business owners with research and development of products while getting experience," Stewart said.

The new dehydrator allows small businesses to produce beef jerky at a reasonable price. (Photo by Todd Johnson)