**Beef Cattle Efficiency**  
Animal Sciences and Industry and Grain Science and Industry, College of Agriculture

### Overview

Kansas State University researchers **build and protect global food systems** by helping livestock producers solve problems and boost gains and nutrition of beef cattle while keeping costs low.

Researchers from the Animal Sciences and Industry and Grain Science and Industry departments in the College of Agriculture recently **collaborated to develop and patent a candy-like coating that protects vitamins and other micronutrients** given to cattle from premature digestion by bacteria in the animal's system. The coating provides an easy, inexpensive way to deliver vitamins, amino acids, and other nutrients to livestock.

A project with beef stocker cattle evaluated ways to **optimize cattle performance and maintain pasture health in drought conditions**. Cattle grazing native grass were fed supplemental dried distillers grains with solubles, a by-product of ethanol production that provides a good source of protein and energy, with different salt levels to limit intake.

### Impact

**Providing nutrients to ruminant animals such as cattle, sheep, and goats is necessary to maximize their health and efficiency,** but bacteria in their digestive systems can break nutrients down before the animal can utilize them. Collaboration across disciplines helped offer a solution to this problem with a corn or wheat protein-based film coating that acts as a barrier. The material bypasses the rumen and is broken down in the animal’s stomach, where strong acids dissolve the coating and release nutrients for absorption. The coating is easily created as a liquid, then dries into **peanut-brittle-like sheets** that can be broken and sprinkled into feed or made into a powder. The patent was licensed by an animal feed manufacturer.

**Producers often turn to supplemental feeds such as dried distillers grains when nutritional quality of pastures suffers because of drought,** but delivering feed adds costs such as fuel expenses and labor. Researchers found that **providing dried distillers grains to cattle on native grass at about 0.3 percent of body weight significantly improved performance. Adding salt controlled consumption,** thus eliminating the need for daily delivery of supplements.

### About Kansas State University

Kansas State University was established in 1863 as the nation’s first operational land-grant university. We've held firmly to the land-grant philosophy of serving our world through discovery and innovation. Today, the university is on its way to becoming a Top 50 public research university by 2025 through supporting, encouraging, and growing our research efforts.

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**RECENT SUCCESSES:**

- **$184.9 million** in FY2014 research expenditures
- **4 USAID** Feed the Future Innovation Labs
- **$473.9 million** in FY2014 endowment
- **1,000** research grants in FY2014
- **more than 4,300** graduate students

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**Important points in time for K-State Research**

- **1863** Kansas State University founded
- **1887** Agricultural Experiment Station built to analyze horticultural and entomological subjects
- **1944** First U.S. patent application filed for a plastic container for frozen foods
- **1957** Alf Landon Lecture Series on Public Issues established
- **1997** Hale Library expansion completed
- **2015** National Bio and Agro-Defense Facility groundbreaking

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**Kansas State University**  
Office of the  
Vice President for Research