



# Research Update

► Summaries of current beef cattle research

## Enzymes boost ethanol production efficiency

As ethanol production increases, so does the demand for suitable feedstocks.

Affordable, plentiful and easy to work with, corn is currently the feedstock of choice in the United States. So Agricultural Research Service (ARS) scientists at the Eastern Regional Research Center (ERRC) in Wyndmoor, Pa., are investigating ways to avoid overburdening the corn market as ethanol production expands.

Annual U.S. ethanol production is projected to increase from 5 billion gallons (gal.) in 2006 to as many as 13 billion gal. in 2009. So what options will ethanol producers have? One solution is to increase conversion efficiency.

David Johnston, a food technologist in the ERRC's Crop Conversion Science and Engineering Research Unit, is investigating new processes using protease enzymes from microbial and fungal sources to make ethanol more efficiently. He has found that the enzymes make more nutrients available for the yeast, expediting fermentation of sugars. Protease enzymes can also facilitate the process of dewatering the solids that remain after the ethanol has been extracted.

Working with Vijay Singh, an agricultural engineer at the University of Illinois, Johnston conducted a field trial at a small wet-milling facility in Panang, Malaysia. They soaked U.S. corn in water for several hours and then applied the enzymes (provided by biotechnology company Genencor International Inc., of Palo Alto, Calif.). The scientists found that adding enzymes during processing increased starch recovery, just as it had in laboratory trials.

The starches can be used in more than 1,000 different products, from paper and Sheetrock® to high fructose corn syrup and ethanol. Economic analysis will be the next step, and Johnston and Singh are planning to replicate the trial at several more commercial facilities.

This is one of many ERRC research projects related to improving understanding and production of biofuels. Read more about the research in the April 2007 issue of

*Agricultural Research* magazine, available online at [www.ars.usda.gov/is/AR/archive/apr07/pe0407.htm](http://www.ars.usda.gov/is/AR/archive/apr07/pe0407.htm).

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## Increases marbling

A considerable amount of time and effort is expended on improving carcass quality through genetics. Wouldn't it be nice if there was something that could simply be added to feed to do the same thing?

Previous research indicated marbling scores were higher in carcasses from grazed cattle with supplementation of Tasco,™ a feed additive produced from brown seaweed. Texas Tech University and Auburn University researchers used 100 steers of about 75% *Bos taurus*, 25% *Bos indicus* genetics to evaluate the effects of Tasco in a finishing program. Half of the steers were fed Tasco for 14 days starting after 45 days on feed and again for 14 days before harvest. Tasco feeding resulted in significantly higher marbling scores and higher percent grading Choice and tended to have more desirable yield grade. However, Tasco had no significant effect on machine tenderness or taste panel evaluation of strip loin or inside round steaks, except that initial tenderness (before aging) of inside round steaks was significantly better for Tasco. Tasco steaks generally showed better color and less discoloration during aging and presentation in the retail meatcase.

The authors concluded that Tasco supplementation "increases carcass quality and prolonged retail shelf life."

— (*J. Animal Sci.* 85:754) as summarized by Steve Hammack, professor and Extension beef cattle specialist emeritus at Texas A&M in the *Beef Cattle Browsing* newsletter

## Keeping mosquitoes out of foreign airspace

First, air curtains — those huge blowers at some commercial establishments' entrances and exits — were tested for use on airplanes to keep mosquitoes and other flying insects from getting on. Now, Agricultural Research Service (ARS)

scientists in Gainesville, Fla., are trying the same technology to keep insect pests from getting off planes after landing.

Pesky mosquitoes can really travel around, but not always under their own power. Sometimes they hitch rides in commercial aircraft, and that can pose problems internationally. Some countries, especially those with high levels of tourism, want assurances that any insects that may be on a plane when it arrives will not leave the aircraft.

Recently retired chemist Dave Carlson, entomologist Jerome Hogsette and colleagues in the Mosquito and Fly Research Unit at the ARS Center for Medical, Agricultural and Veterinary Entomology, in Gainesville, have investigated this alternative control approach.

Hogsette and colleagues tested the air curtains' ability to blow hitchhiking insects back into the cabin while passengers disembark. A minimum airflow of 6,000 cubic feet per minute is sufficient to prevent insects from passing through. Placing net curtains or screens impregnated with safe-to-handle pesticides across front and rear doors kills any insects that may attempt an escape. To control insects that may remain, aerosol sprays can be used after all crew and passengers have left the aircraft.

Health officials from several Caribbean countries have shown interest in using air curtains to prevent insect escapes from incoming flights. Currently, in-flight spraying of passengers, crew and crew quarters is done to prevent accidental introduction of invasive species into the country. It is hoped that air curtains can provide a viable alternative to chemical sprays that currently raise health concerns.

Read more about the research in the April 2007 issue of *Agricultural Research* magazine, available online at [www.ars.usda.gov/is/AR/archive/apr07/pe0407.htm](http://www.ars.usda.gov/is/AR/archive/apr07/pe0407.htm).

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