

# Reuse Of Ethanol Enzymes Studied

**BY DIRK LAMMERS**  
Associated Press Writer

SIoux FALLS — A South Dakota State University researcher is looking into ways to reuse enzymes, a high-cost ingredient in the making of ethanol from such nonfood feedstocks as switch grass, bluestem and corn stover.

Enzymes are proteins that serve as catalysts in many natural and manmade processes, including the conversion of plants' cellulose into biofuels.

But the expensive enzymes typically float away after they do their job, said Basil Dalaly, a professor in SDSU's Nutrition, Food Science and Hospitality Department.

Dalaly and graduate student Pavani Mandali are experimenting with ways to reuse the enzymes by chemically attaching them to glass beads, then using the beads multiple times. It's an approach used in the food industry to produce such substances as high-fructose corn syrup.

Enzymes can account for as much as \$1 per gallon of the costs of producing cellulosic ethanol, which are running some companies around \$2 per gallon. Dalaly is hoping to cut that cost in half.

"Instead of using the enzyme once and throwing it away, we're immobilizing the

enzymes on beads and using the enzymes for three, four or five cycles," he said. "In doing so, we're reducing the cost of enzymes."

Mark Stowers, senior vice president of science and technology at ethanol producer Poet, said enzymes are one of the highest costs in cellulosic ethanol production. Enzyme producers are reducing costs, but new avenues should be explored, he said.

"The work at SDSU has the potential to shake up the current paradigm of enzyme technology, and we will be watching closely with the hope that their work reaches commercial fruition," Stowers said.

Dalaly's research, which began five years ago, is funded by the U.S. Energy, Transportation and Agriculture departments. Danish company Novozymes is providing the enzymes.

SDSU scientists are producing the ethanol from switch grass, bluestem, corn stover and distillers grains, with engineers in the university's Agricultural and Biosystems Engineering Department pretreating the biomass.

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MARK STOWERS

Once the enzymes are chemically attached to the beads, they're used to grab the cellulose out of the feedstocks.

Researchers then collect the enzyme-covered beads and add them to a new batch, though reuse has a point of diminishing returns.

The enzymes lose about 10 percent of their activity after the first cycle, and their effectiveness is cut in half by the fourth or fifth cycle.

Dalaly said researchers are trying to figure out how to preserve as much activity in the beads, and they also need to quantify how attaching the enzymes to the beads changes their properties.

"We have a lot of work ahead of us," he said.

# Nebraska City To Implement Immigration Measure

FREMONT, Neb. (AP) — The city of Fremont has moved ahead with the implementation of a new ordinance barring residents from hiring or renting homes to illegal immigrants, despite the threat of a legal challenge.

The city announced Friday that forms to obtain a renter's license, along with information for employers, would be available on its website.

The city also scheduled three orientation sessions for later this month to answer questions about the ordinance.

The Fremont City Council approved the ordinance Tuesday. Residents approved the ban last month in a vote certified by election officials, but it needed council approval before it could take effect.

The ban could take effect in about two weeks, but the American Civil Liberties Union has promised to challenge it in court.

The ordinance requires people seeking to rent property to apply for a \$5 permit at City Hall. Those who declare they are U.S. citizens would have their applications approved on the spot, without further questions or documents proving their legal status.

Those who said they weren't citizens also would immediately receive permits, but their legal status would be checked. If the checks don't show that they were in the country legally, they would have 60 days to resolve their status. If they couldn't do that, police would inform them they had 45 days to leave the property.

Only new renters — not current tenants — would be affected by the ordinance, and landlords who knowingly rent to illegal immigrants could be subject to \$100 fines.

The ordinance also requires employers to use a federal online system that checks whether a person is permitted to work in the U.S.

## MIDWEST DIGEST

### Education Given On Domestic Violence

PIERRE (AP) — South Dakota is embarking on a two-year program to educate school children about what to do if they or a friend is experiencing domestic violence, dating violence and bullying.

The outreach and education campaign is partnership between Verizon and the South Dakota Network Against Family Violence and Sexual Assault. Verizon, through its foundation, is donating \$13,750 toward the effort.

The program will inform youth on resources, symptoms and the role that technology plays to prevent and perpetrate abuse.

### Omaha Man Charged In Hit-And-Run Case

OMAHA, Neb. (AP) — An Omaha man faces a charge of motor vehicle homicide after a crash victim died of injuries suffered in an April hit-and-run.

Brandon Brewer was already charged with leaving the scene of an injury accident, driving under suspension and reckless driving. The new charge was added Friday.

Police say the 24-year-old Brewer ran a red light and crashed into another car, then fled the scene. Sixty-seven-year-old Annie Stennis died in June from injuries she suffered in the crash.

No number was listed for Brewer. He's being held in the Douglas County jail on \$200,000 bond.

### Grant Given To Makeover Martin

MARTIN, S.D. (AP) — The small South Dakota city of Martin is getting a \$977,500 federal grant to revamp its central business district.

The U.S. Department of Housing and Urban Development funding aims to expand the production of affordable housing in Martin's Main Street area.

The southwest South Dakota town of about 1,100 residents is the economic hub for Bennett County and the largest town in the region.

The project will renovate the town's Gambles Building, which has been vacant for the past 15 years.

The city will build four affordable rental units on the second floor of the building and reconfigure the first floor into 12 rooms of inexpensive commercial space.

Communities in Colorado, Georgia, Iowa, Alaska and Puerto Rico also received HUD funds.

### McGovern To Skydive On Birthday

SIoux FALLS (AP) — Former U.S. Sen. George McGovern plans to celebrate his 88th birthday by skydiving.

McGovern says Monday's parachute jump at the Skydive Space Center in Titusville, Fla., was inspired in part by his friend and former president George H.W. Bush. Bush skydived on his 75th, 80th and 85th birthdays.

McGovern also says he's wondered what it was like to jump from an airplane since his days as an Army combat pilot in World War II. He says there were several times that he lost engines or parts of his plane while flying over Germany and was close to bailing.

**Jill Cataldo saves hundreds on groceries by making the most of the common coupon. You can, too. Here's how.**



## Coupon Tips for Shoppers in Small Markets

Last week, we reviewed reasons why shoppers enjoy lower prices and more frequent deals shopping at a supermarket rather than at an "everyday low price" supercenter. But what if your shopping options are limited? What if you don't have a large supermarket nearby and you're limited to a small grocery, a family-owned store or a supercenter?

The best grocery discounts are found at big, regional or national supermarket chains. Think of big supermarkets as "high/low" stores, based on the way they cycle prices. On any given day, about half the items in a big supermarket will be priced higher than a midline level. The other half of the products will be priced lower than that midline.

Coupon shoppers wait for lower prices, then use coupons to reduce prices even more. Many of the best coupon shoppers rely on grocery list "matchup" websites that track sale prices for supermarkets around the country, providing a list of the best buys each week and matching up the coupons needed to purchase sale products. (For a list of popular matchup sites go to the Getting Started section of my website, [www.SuperCouponing.com](http://www.SuperCouponing.com).)

Back in the day, people would simply cut all of the coupons out of the newspaper each week then spend time organizing and sorting hundreds of little, loose pieces of paper. Now, it's easier. With the system I teach, we keep each week's entire coupon insert intact and only cut the coupons we need. Coupon matchup sites refer to coupons by the dates they were distributed in the newspaper and by the names of the insert. So, a reference to "5/2 SS" tells me that the coupon I need is in the May 2 edition of the SmartSource insert. Since I write the date on the front of each coupon insert before I file it, it's easy to locate the insert and clip the coupon.

If your only local shopping option is a small grocery store, you may not be able to use an online matchup list that spells out exactly the best coupons to use. You'll need to match coupons to sales on your own. But that's not as difficult as it sounds and I've got a tool that will help. Grab the sales flyer for your store of choice and sit down at your computer.

Visit [SuperCouponing.com](http://SuperCouponing.com) and click on the "coupon lookup." This free tool helps shoppers match coupons to sales. Look at your store's flyer and circle the items that interest you. Then, use the online coupon lookup to find coupons for those products. Enter general categories like soup or cereal, or brand names like Progresso or Kellogg. The lookup will tell you the dates and names of the inserts where you will find coupons for the desired products. Note that location info next to each item you circled in the store flyer. When you're done making matchups, refer to the flyer and pull the corresponding coupon inserts from your files. Cut out just the coupons you need today, refile the inserts for future use and head to the store.

If your only shopping option is an everyday low price supercenter, you may not enjoy many deals where you take products home free after using coupons. Prices at everyday low price stores typically do not dip low enough to match the dollar amounts of high-value coupons. But, you can still use the online coupon lookup tool. You'll certainly save much more than you would if you didn't use coupons at all.

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Jill Cataldo, a coupon workshop instructor, writer and mother of three, never passes up a good deal. Learn more about couponing at her website, [www.supercouponing.com](http://www.supercouponing.com). E-mail your own couponing victories and questions to [jill@ctwfeatures.com](mailto:jill@ctwfeatures.com).

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