



# AG INNOVATION NEWS

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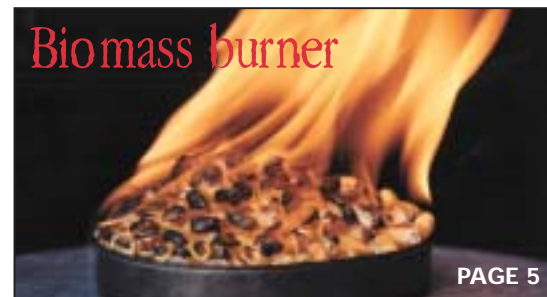
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PHOTOS BY ROLF HAGBERG

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# Fuels from farming

BY EDGAR OLSON

**Y**ou don't know what you've got until it's gone, right? That's especially true when it comes to energy.

We've grown accustomed to instant power; flip a switch and lights go on. We tend to notice our power, or lack of it, only when the car coasts to a stop on an empty tank or the electricity goes out on a stormy winter night.

But we're also aware of our energy supply when we pay the utility bill or fuel the car; the past twelve months have seen wide fluctuations in fuel costs. For most consumers, these changes appear to occur for little or no reason. Such is the case when we rely on foreign sources for our energy.

At AURI, we have taken the initiative to work towards greater awareness and acceptance of renewable ag-based fuels. Whether fuels such as ethanol and biodiesel or systems like digesters or biomass furnaces, alternative energy sources have moved from the domain of zealots to more mainstream acceptance.

In this issue of Ag Innovation News, you will find several stories related to energy derived from ag-based sources. These stories represent emerging opportunities to further ag-based energy and benefit the state's farmers.

Successfully marketing alternative fuels and systems will shore up prices for farm commodities while reducing dependence on outside energy sources. That's what I call power.



OLSON.

## HACCP workshop this month

*St. Cloud, Minn.* — AURI is offering Minnesota meat and poultry processors a workshop on January 15-16 for training and planning in Hazard Analysis Critical Control Point systems.

Participants will come away with a plan for their facility and basic information on implementing the safety system. Those who complete the course will receive a certificate and an accreditation seal from the International HACCP Alliance.

The registration fee of \$140 per person includes textbook, materials and refreshments. Pre-registration is required as space is limited.

*For more information or to register, contact Louise Eischens or Darrell Bartholomew at the AURI Southwest Field Office in Marshall, (507) 537-7440.*

## Homegrown energy seminars

*Lake Crystal, Minn.* — Homegrown energy is the focus of four sessions this month on the potential of ag-based power. The two-hour sessions will provide the latest updates and information on agricultural energy industries, focusing on such topics as biodiesel, ethanol, wind energy and digesters.

Scheduled for January 3, 10, 17 and 31 at the American Legion in Lake Crystal, the sessions will run from 1-3 p.m. each day. Topics are:

January 3: Biodiesel industry and opportunities

January 10: Ethanol industry and opportunities

January 17: Value-added resources and alternative energy opportunities

January 31: Evaluating value-added opportunities

Scheduled presenters include State Commerce Commissioner Jim Bernstein, Sen. Jim Vickerman, AURI Senior Scientist Max Norris, University of Minnesota Extension Educator Kent Thiesse, and Ralph Groschen of the Minnesota Department of Agriculture. Panel discussions will involve other Minnesota ag leaders.

Pre-paid registration is \$10 per session or \$35 for all four sessions. Cost at the door is \$15 per session.

*For more information contact Kathie Davis of Resource Connections at (507) 345-3029 or Jerry Rollings of JR Connections at (507) 546-3089.*

## Norris and Christopherson honored by soybean groups

*Mankato, Minn.* —AURI senior scientist Max Norris received the Domestic Marketing Award from the Minnesota Soybean Research and Promotion Council at its 40th anniversary celebration November 30.

Norris and AURI have collaborated with MSRPC on numerous projects, including the development and marketing of soy-based Preference and Destiny surfactants, Barrier livestock odor control products, SoySoft hand lotions, Renaissance fertilizers, DustLock road dust control and Eco-Line rust inhibiting products.

"It is an honor to be acknowledged," Norris says. "It's also an honor that (MSRPC) recognizes and appreciates their collaboration with AURI and the impact we've been able to have on growers. It's an affirmation that this liaison has been fruitful."

The Minnesota Farm Bureau Federation and its president, Al Christopherson, received the Ag Policy Award from the Minnesota Soybean Growers Association for supporting biodiesel. Christopherson chairs the AURI board of directors.



NORRIS.

A nonprofit corporation created to strengthen rural Minnesota's economy, AURI helps businesses respond to market opportunities with new and value-added uses for agricultural goods. The Institute builds working partnerships with business innovators, agricultural groups and researchers, and provides technical support to clients conducting new product research and development.



Following is a brief overview of AURI services. For more information, contact the office nearest you.

**An Initial Project Assessment** helps determine the technical and market feasibility of an ag-based product or technology. Applicants must demonstrate their projects will impact the use of traditional or alternative crops and livestock. The IPA program is designed to add value to agricultural commodities and foster long-term economic growth.

**The Market Assessment Program** identifies new or alternative market opportunities that add value to Minnesota farm commodities and benefit the state's producers. MAP is open to farm organizations, commodity groups, grower associations, agribusiness groups, public entities, nonprofit organizations and/or producer groups and is specifically designed for projects where a business or research partner is not yet involved in commercialization.

**The Technology Transfer program** identifies and develops value-added technologies and helps move technology from public and private entities to Minnesota businesses. Applicants must demonstrate the technology will impact commodity use.

**The Pesticide Reduction Options program** funds research and demonstration projects intended to reduce the use of petroleum-based products in farm production.

**AURI's Applied Research Services** complement technical and financial assistance. The Institute's research staff works with agribusinesses, university scientists, federal labs and commodity groups to access new technology and link it to commercial partners.

AURI also operates several **laboratories and pilot plants** that support innovative, ag-based product development. With staff expertise and commercial-grade equipment, the facilities offer a full range of services, from ingredient analysis to test production runs.

Facilities include:

- Pilot Plant and Product Development Kitchen, Crookston
- Waste Utilization Laboratory, Waseca
- Fats and Oils Laboratory, Marshall
- Meat Laboratory, Marshall

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# The E-power pair

Pursuing the next step in renewable fuels, Minnesota organizations test combinations of ethanol and soy diesel

BY DAN LEMKE

*Mankato, Minn.* — Oil and water don't mix, but soy biodiesel and ethanol are a powerful pair. They are being tested as a fuel additive known as ethanol diesel, or EB-diesel.

Research to determine optimal blends and EB-diesel's effect on engines is underway at both Minnesota State University, Mankato and North Dakota State University. Sponsoring partners include the Minnesota Corn Research and Promotion Council, the Minnesota Soybean Research and Promotion Council and AURI.

The NDSU Energy and Environmental Research Center is working to discover the optimal blend of ethanol and biodiesel. AURI oils scientist Max Norris says the resulting EB-diesel could constitute up to 24 percent of a petroleum diesel blend. Once EB-diesel is optimized, it will be tested along with two other commercial additives at MSU's Center for Automotive Research to determine emissions characteristics and effect on diesel engine wear and tear.

Testing to determine flammability point and to address safety factors must also be conducted before EB-diesel could become a certified fuel.

Although the research is in the early stage, and EB-diesel pumps at local gas stations are a ways off, proponents hope they have identified new opportunities for grain-based fuel.

"The end goal is to be a piece of the puzzle in what's being done to get ethanol and diesel together as a fuel," says Yvonne Simon of the Minnesota Corn Growers. "Research is being done on ethanol diesel in other states, but we're the only ones including biodiesel in the mix."

"EB-diesel is a second generation product for both

commodities," Norris says. "Ethanol has carved out a niche, and biodiesel is carving theirs. This has the potential to aid growers of both plants by allowing them to be at a higher level of self-sufficiency."

Biodiesel has advantages over petroleum diesel in areas such as lubricity and emissions. The addition of ethanol to the mix could help even more.

"If there's a way that ethanol can help address our nitrogen oxide (emissions) issue, it would certainly help the biodiesel cause," says Mike Youngerberg of the Minnesota Soybean Research and Promotion Council. "That's one more thing we can add to our list."

The research partners will seek validation from the American Society of Testing Materials, which could help get EB-diesel certified as a fuel by the Environmental Protection Agency. John Deere will be testing the fuel in tractors and combines. ■



**"Research is being done on ethanol diesel in other states, but we're the only ones including biodiesel."**

— Yvonne Simon, Minnesota Corn Growers

PHOTO BY ROLF HAGBERG



# Pork pride

SEVEN YEARS OF LABOR ACHIEVES  
A \$6 MILLION PORK PROCESSING PLANT  
IN SOUTHWEST MINNESOTA

BY E. M. MORRISON

**Dawson, Minn.** — This month, a southwest Minnesota cooperative will begin processing its own pork in a \$6 million packing plant.

Prairie Farmers Cooperative will slaughter about 65,000 hogs a year at the USDA-inspected plant, making custom pork products that can be traced from the dining table back to the farm. The new venture locks in a market for its 81 members, all small-scale swine farmers in southern and western Minnesota who expect more stable producer prices and investor dividends from the deal.

## Small runs

With a slaughter capacity of just 290 hogs a day, Prairie Farmers hopes to make a virtue of being small, says manager Jack Hawk, former director of the Small Business Development Center in Marshall.

"Everybody says bigger is better. But we believe our size is a competitive advantage," Hawk says. State-of-the-art technology makes the plant efficient, so Prairie Farmers can process at competitive prices. At the same time, it can produce small runs of specialty items, a service that's not cost effective for larger packers, Hawk says. For example, "if a customer wants bacon a certain thickness or pork chops a certain way, we can do that."

The plant's sophisticated source tracking system preserves the identity of every animal throughout processing and distribution. This will let Prairie Farmers market the distinctive qualities of its meat, such as antibiotic-free production, humane animal treatment and on-farm food safety measures.

These features are important to a growing number of consumers here and abroad, says Prairie Farmers Marketing Manager Randy Wallerich, former director of meat operations for Fairway Foods and a 20-year veteran of the meat industry. "Today's consumers want to feel good about the food they buy."

## Fresh out of the chute

Prairie Farmers plans to roll out its products in phases, Wallerich says. "We're starting with a generic product — no brand, no claims, just fresh pork out of the chute." This will give the new company time to establish a reputation for top quality and service, he says.



Marketing manager Randy Wallerich is promoting the PFC pork family-farm origins.

Later this year, the cooperative will introduce a premium line of bacon, smoked ham and picnics under the Prairie Farmers label.

The cooperative is also pursuing contracts to process pork products for small food companies.

At the retail level, Prairie Farmers will work with meat merchandisers to promote the co-op's products. "We'll tell about how it's raised, how it's produced," says Wallerich, who plans to enlist co-op members as spokespeople. "They're fantastic. This is their livelihood and they can really sell it."

But as a new player in the meat industry, Prairie Farmers faces a tough challenge, warns

Wallerich, who handled marketing for Red Oak Farms, an Iowa meat company. "There's something like a 95 percent failure rate on new products. So it's not enough to tell your story; your products have to fill a void."

Nevertheless, telling the small producers' story is an essential part of the co-op's marketing plan. "Our logo says 'From our family to yours,' and we mean that," Hawk says.

## The seven-year pitch

The Prairie Farmers' story began in 1995 during a time of rapid consolidation in the hog industry. Independent farmers, without contracts or pricing power, feared losing markets to larger producers.

To secure a market and to have more control over processing, growers joined to build their own packing plant, investing \$2.6 million. More than a half-dozen public and private organizations contributed to the project, including USDA, the Minnesota Department



PHOTOS BY ROLF HAGBERG

Representatives of the 81-member Prairie Farmers Cooperative look forward to capturing more value from their corn-fed pork by managing processing and marketing. From left to right they are: Lyle Haroldson, Nolan Jungclaus and Dave Hesse.

of Agriculture, the Minnesota Department of Trade and Economic Development and AURI.

Co-op members will supply an average of 800 hogs a year to the plant. Payments on a cut-weight (rather than the common live-weight) basis will lend superior producers an advantage, Hawk says. "They're rewarded for raising a higher quality hog." Quarterly price averaging will even out commodity price swings, he adds, providing more stable farmgate revenue.

The new business brings other benefits, too. The plant, which employs 45, will pump an annual payroll of \$1.3 million into the Lac qui Parle County economy. And producers will share the profits.

That is the most important benefit, says AURI meat scientist Darrell Bartholomew, who has worked with Prairie Farmers from the beginning. "Farmers will be able to carry their product further along the marketing chain and reap greater reward from the products that are sold." ■

## AURI at work

### Services AURI provided Prairie Farmers Cooperative include:

- Market assessment study
- Business plan development (technical portion)
- Plant design review
- Market development
- HACCP training
- Recipe development and testing
- New product development



# Raising power at home

## A Minnesota company designs a furnace to burn corn or agricultural byproducts.

BY DAN LEMKE

*Elk River, Minn.* — Robert Walker has smelled the opportunity in biomass energy, and it has him wide awake after a comfortable sleep.

As founder of Select Comfort Corporation and designer of the "Sleep Number Bed" air sleep system, "the products I'm interested in are ones that I think are beneficial to mankind," Walker says. "I'm intrigued by a similar scenario — providing an effect on our energy system."

Last March, Walker founded Bixby Energy Systems with a vision of developing and marketing high-tech biomass energy. Bixby began producing a space heater in November. But its sights are set much higher.

### High burn rate

High fuel costs last heating season gave rise to renewed interest in alternative energy, including burning dry shelled corn. Several corn-burning furnaces have already been developed, but Walker says

Bixby's proprietary technology makes its systems operate more efficiently. Developed by Bixby's chief technical officer, Marion Mast, the "MaxYield" system incorporates high levels of oxygen for a good burn rate and constantly monitors and adjusts fuel flow to maximize heat output.

Bixby Energy is working to certify fuels for their systems. According to the U.S. Department of Energy, shelled corn is one of the lowest cost fuels per Btu. Bixby isn't limiting its efforts to corn, however; AURI is helping identify and test a wide range of ag products that could be pelleted as fuel.

"They're not just selling burners, they're integrating the fuels into their system," says Jack Johnson, who heads up AURI's coproducts utilization program. "It's a technology that burns efficiently and combines renewable fuels. That's what makes it attractive to us."

### Power as well as heat

Furnaces may be the first products available, but Bixby Energy's goal is to develop biomass systems capable of heating a home and its water and generating electricity. Walker hopes to have these distributed power systems available within three years.

"(America is) too dependent on foreign sources for our energy — too dependent on others' whims," Walker says. "By utilizing these 'super pellets' made from ag products, we can make a real impact. There's a double benefit, because the money for our energy isn't leaving the country, plus we're using up a low-value product that is really a valuable, renewable resource."

Alternative energy sources have gained attention as fuels such as natural gas, liquid propane and fuel oil have undergone wild price fluctuations. Walker says that when biomass fuels reach their most cost competitive level, they'll be cheaper than fossil fuels, which adds to their attractiveness.

"The evolution is occurring," he says. "With knowledge and training we can become used to biomass as an energy source. This is a gold mine we just haven't tapped."

*Bixby Energy Systems stoves are available at selected fireplace and wood stove retailers. For more information, visit the Web site: [www.bixbyenergy.com](http://www.bixbyenergy.com)* ■



PHOTO BY ROLF HAGBERG



## AURI at work

### Services AURI provided Bixby Energy Systems:

- Fuel development
- Fuel testing and analysis



## An antidote in time

In the fight against an *E. coli* strain and other nasty microbes, Camas may be hitting at the right time with a high-tech cattle feed additive.

BY CINDY GREEN

*Le Center, Minn.* — Microbiologist Peter Nash has always been ahead of his time. During the Gulf War, he worked on anthrax tests, but when the war ended, so did the federal funds. In the late 1980s, he developed quick swab tests to detect *Listeria* in feedlots and *E. coli* in processing plants. But the livestock industry didn't have a sense of urgency or financial incentive to invest in testing.

Outbreaks and threats have changed all that. But by the time public policy and markets caught up to his research, Nash was on to something else.

Now, after nearly three decades of microbial study, the president of Camas Inc. has designed all-natural cattle feed additives to inhibit a dangerous *E. coli* 1057:H7 strain and improve feed efficiency with "impressive results."

What's kept him going? "The dream that eventually we would hit it right," Nash says.

### Forming an attachment

In its Le Center labs, Camas formulated two nutritional additives to mix with feed. Both are delivered as coatings on soy-based pellets produced by Honeyfeed in Mankato. The pellets are coated at Camas' pilot plant. In a cow's stomach, the additives swell up and release material that coats the lining "like pepto bismal," Nash says.

"This delivery mechanism is a breakthrough," says Brad Mitteness, Camas' marketing director. "No one has ever done it before."

One additive attaches to *E. coli* 0157:H7 and stops it from colonizing; the other targets "bad" bacteria that compete with good bacteria in a cow's digestive system. The net effect is it takes less feed to effect weight gain. Camas is coating pellets with one or both nutritional additives, although the *E. coli* treatment is only needed for 30 days before slaughter — an ounce or two per day.

Camas has not yet priced its digestive additive, but Nash says it will cost considerably less than its value. "Farmers can start feeding this to cattle at a young age and it will more than pay for itself."

### So early so often

Fighting bugs in livestock was not what Nash envisioned when, as a young man, he studied to be a medical doctor and expected to treat human patients. After obtaining his Ph.D. in microbiology, he taught for 20 years at the Indiana School of Medicine, University of Minnesota and Minnesota State University, Mankato — covering 13 areas of medicine, from parasitology to immunology to virology.

In 1984, Nash received a call from BSI, an emerging medical company (now called Surmodics) specializing in human diagnostics. Relocating to Eden Prairie, he went to work developing tests for strep,

whooping cough, salmonella, toxins and other diagnostics.

Along with BSI founders Don Robinson and John Rosevear, an M.D. and researcher, Nash spun off Camas Inc. in 1987. From the University Technical Center in Minneapolis, they expanded their work in rapid human diagnostics to agriculture — researching *Campylobacter*, *Pasteurella* and *E. coli* 0157:H7 with federal dollars. Camas has done work for the Department of Defense, U.S. Marines and USDA.

In 1989, with AURI's help, Camas designed a state-of-the-art field test for *Listeria*, a bacterium that causes serious illness or death in people with weak immune systems. Carried in contaminated soil or water, "it's a sanitation issue," says AURI meat scientist and food safety expert Darrell Bartholomew. "It can get on floors, ceilings, even in refrigeration. And once it's established, it can cause problems."

"The test kit was successful but, at that point, companies preferred not to test. They didn't want to know whether they had a problem or not." Now they do, Bartholomew says, because "a couple years ago we had some huge recalls with *Listeria* in ready-to-eat foods. There were some deaths and millions of pounds of product were recalled."

Camas also developed and patented a swab test for *E. coli* 0157:H7 that showed results in a few minutes. But Nash says USDA didn't want to test processors until it had a procedure to deal with contaminated meat. "They said, 'if you have it, what do you do with it? And if you have 600 carcasses coming down the line, you can't stop the line.' ... We couldn't get investors. Nobody seemed to be too excited about 0157:H7."

Then there was a major outbreak in 1993 and tests were mandated a few years later. But like the *Listeria* and anthrax tests, Camas had already abandoned the project. "They were ahead of their time," Bartholomew says. "They came out too early."

### Treatment vs. testing

After the government funds for anthrax tests dried up, Camas tried developing other diagnostics, but were discouraged. "Doctors don't want the tests on the market. They're afraid people would misuse and misrepresent the results. Was the sample taken right? Were the results read right? They can't be perfect."

Switching from diagnostics to treatment, Nash and Rosevear began exploring the potential of an isolated protein that clung only to *E. coli* 0157:H7. Not only did it detect the bacteria's presence, but they also discovered it would prevent the *E. coli* strain from adhering to the intestinal wall. "If it can't adhere, it can't reproduce and it's flushed out of the digestive tract," Mitteness says. None of the additive enters the bloodstream.

PHOTOS BY ROLF HAGBERG

There are hundreds of strains of *E. coli*; most are benign. However, the 0157:H7 strain has evolved into a potent, deadly toxin-producing bacterium that can shut down kidneys and cause death. Nash says the only treatment is support therapy — keeping a patient stricken with diarrhea hydrated, for example.

*E. coli* is a tough opponent, Nash says. "0157:H7 likes cold weather, it will thrive in the refrigerator, and is detrimental to young kids and the elderly."

The bacterium is primarily carried in the feces of cattle and can get into "meat, produce, water — anything that comes into contact with manure from affected cattle." Contamination usually occurs at the processing plant — typically in ground hamburger, although cooking meat well will kill the bacteria.

"*E. coli* (in processing plants) is at such low levels that finding it is like looking for a needle in a haystack," Bartholomew says. "You can test and test and test. What I like about what they're working on is it will eliminate *E. coli* at the farm level."

## Revolution at the right time?

In the early 1990s, when Nash and Rosevear discovered they could stop 0157:H7 without drugs or antibiotics, they knew the research had huge implications. But they were again skeptical that the industry would invest in it.

Nash left Camas in 1994 to do consulting work for a Madison, Wisc. company. After Rosevear died in 1998, Nash returned to pursue treatment-oriented feed additives. Around the same time, Steve Weiland, who holds a master's degree in microbiology and immunology, joined Camas. Mitteness had joined in 1997.

They experimented with several isolated proteins to target bugs competing with good bacteria in a bovine's first stomach chamber, or rumen. When cattle eat grass, the rumen breaks down cellulose into protein and carbohydrates. "But some bacteria in the rumen are not helpful; they break up protein into ammonia and waste protein," Mitteness says. The Camas additive "bathes the gastrointestinal tract so the targeted organisms can't attach to stomach lining and reproduce — they just float right on by. ... It's an all-natural product. You can't overdose"

Photo by Scott Bauer, courtesy ARS



Replicated trials have been conducted on hundreds of cattle in Minnesota and Idaho and the

results "have been startling," Mitteness says. "We are not sure why, but beside gaining weight faster, the cattle also grade and yield better." In one trial, treated cattle yielded 80 percent choice and prime meat, versus 67 percent in the control group. The USDA quality grade is based on intramuscular fat content, which gives meat tenderness and flavor, as well as the animal's age. "That's a huge economic boost for cattle farmers operating on thin margins," Mitteness says.

"All of the farmers who have helped in the trials have been positive," Nash says. "I've never experimented with new products before



The Camas management team, from left: Don Robinson, operations manager; Peter Nash, president; and Brad Mitteness, marketing manager, are launching all-natural feed additives that improve cattle weight gain and may stop a dangerous strain of *E. coli*.

where the people who tested it are so excited about it."

## If safety sells ...

Last spring, to get closer to their feedlot trials and their Mankato supplies, Camas moved to Le Center where there was an available building and "a lot of local support," Nash says. In November, the company started limited production runs and expects to be in the market within 12 to 18 months, selling to feed companies and producers, including natural beef farmers because "it doesn't impact natural or organic labels," Mitteness says.

In addition to the cattle additives, the company is designing products for hogs and poultry and plans to roll out 10 new products over the next few years. The staff of 13 should double within a year, Mitteness says.

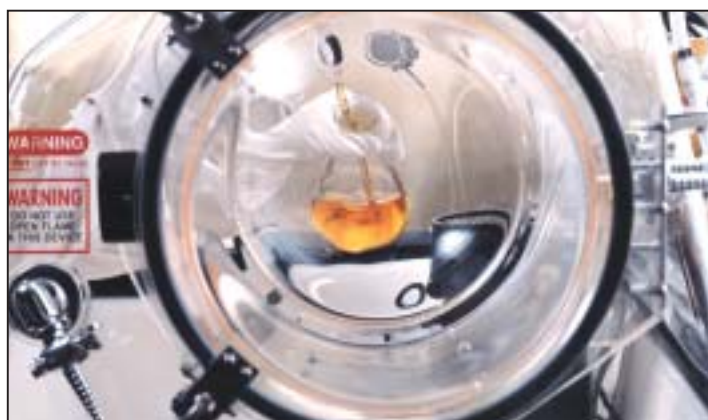
Nash says the time is right because "antibiotics are going out of favor. The European Union is banning many antibiotics. Also, we can feed treatment in cases where you can't give antibiotics (such as lactating dairy cattle)."

The technology has numerous other

applications. For example, "steers pushed to gain weight in a feedlot will suffer with low rumen pH. We can remove those acid-producing bacteria," Mitteness says. "We can find the bug we want to target, grow it in the lab, figure out its adherence mechanism, then engineer a product that blocks that specific strain."

Adding value to cattle by promoting weight gain is a direct economic benefit, but Bartholomew says a safe food supply has economic value too. "Food safety is difficult to put a dollar value on, but when people stop consuming (because of an outbreak) that has real impact. Processors can maintain separate identities for this meat and if it's staying raw, they have a safer source. I can see a demand building for animals that are treated by this process."

"It's something that can have national impact — and beyond. It has real potential and we hope it will be applied." ■



Camas' LeCenter laboratory includes an anaerobic chamber that emulates a cow's stomach, with controls on atmospheric gasses and temperature so scientists can grow, isolate and work on targeted organisms.

## AURI at work

### Services AURI provided Camas include:

- Research and development assistance
- Technical feasibility studies
- Field trial support



# want ELK?

Minnesota elk producers face tough competition at the meat market



BY E. M. MORRISON

*Brandon, Minn.* — Kaye Zearth is an "antler farmer."

She and her husband, a Douglas County veterinarian, raise domesticated North American elk. Last season their herd produced 1,300 pounds of velvet antler, a traditional Asian folk medicine. Just a few years ago, the crop would have fetched more than \$140,000. Today, it is worth a tenth of that.

Faced with plunging velvet antler prices,

Minnesota elk producers are turning their attention to selling meat. "If we don't, our industry is doomed," says Zearth, president of the Minnesota Elk Breeders Association.

AURI and the Minnesota Department of Agriculture are helping state producers explore markets for elk meat. The research will help Minnesota's newest livestock industry diversify, says Dennis Timmerman, AURI project director in Marshall. It could also lead to new processing or marketing ventures.

## Antler medicine sparks an industry

American elk, hardy deer native to North America, have been farmed in this country for a century. But it is only in the last decade that elk numbers have risen substantially, says Brenda Hartkopf, a Howard Lake producer and executive secretary of the Minnesota Elk Breeders Association.

Before 1985, Minnesota had about two dozen elk farms. "The

industry really took off in the early '90s," Hartkopf says. Driven by strong demand from Korea, velvet antler prices soared, topping \$100 a pound in 1993 and 1994. Prices for breeding animals "went through the roof." While the frenzy lasted, blue-ribbon cows brought as much as \$20,000; prize bulls brought up to \$100,000.

Between 1991 and 1999, more than 230 Minnesota farmers started raising elk. Hartkopf and her husband, for instance, got



PHOTOS BY ROLF HAGBERG

PHOTOS BY ROLF HAGBERG

Larry Winter, past president of the Minnesota Elk Breeders Association, began raising elk in 1993 primarily for breeding and velvet antler. But after velvet prices plunged in the late '90s, he started focusing on selling elk meat directly to consumers, from jerky to prime cuts.





into the business in 1992. They began with three heifer calves, which they built into a herd of 130. Like other growers, they were attracted to elk farming by the prospect of high returns, relatively simple management, and the intangible yet powerful allure of the beautiful half-wild creatures. Now, the state's 264 elk farmers have nearly 11,000 animals behind fences, according to the Agricultural Statistics Service. That makes Minnesota the country's leading elk producer.

## Velvet demand softens

Profitability in the expanding elk industry depended on velvet antler sales and breeding, says Zebarth, a former schoolteacher who got into the elk business in 1990 and now oversees a herd of 360.

But in 1997, the economic downturn in Asia dried up demand for velvet antler. Prices collapsed to about \$20 a pound. They slid even more when Korea banned American velvet imports because of an outbreak of chronic wasting disease in Colorado herds.

About the same time, the elk industry adopted artificial insemination, which sharply cut demand for bred females and calves. Artificial insemination did boost semen sales, however. Last year, the Zebarths sold \$150,000 of semen from their four-year-old bull, Oak Point Jesse — a world-champion antler producer named for Minnesota's governor.

Because the elk industry is still in the stock-up phase, Zebarth expects the market for elk genetics to remain strong. But in the long run, she says, "meat has to be the foundation of our industry. We can't just sell breeding stock to each other and survive. We've been slower to recognize that, maybe, than we should have been."

## Looking for customers

Currently, about 15 percent of state elk producers sell meat, Hartkopf says. Last year, 270 head were sold for slaughter in Minnesota, according to the Ag Statistics Service. However, Hartkopf estimates



Brenda Hartkopf, Minnesota Elk Breeders executive secretary, has seen the elk industry explode since she started raising elk in 1992. Today, Minnesota leads the nation with 264 farmers raising 11,000 elk.

Minnesota producers now have the capacity to supply about 100 head a month for slaughter — roughly 360,000 pounds of meat a year.

To develop markets, state producers formed the Minnesota Elk Cooperative last spring. The co-op is now surveying retailers, wholesalers, meat distributors, food service companies and restaurants to measure interest in elk products.

As the Minnesota elk industry matures, "we have to make sure demand for meat grows along with the supply of animals," says Larry Winter, an elk producer from Princeton and a past president of the Minnesota Elk Breeders. Winter started raising elk in 1993 and now has a herd of 270. He sells velvet antler, hard-antler bulls for game farms, breeding stock and semen. Recently, he began slaughtering animals for meat.

Winter and other industry leaders are convinced elk meat could have broad appeal. Farm-raised elk is lean and tender, lower in fat and cholesterol than skinless chicken. Hartkopf says consumers find it less exotic than alternative red meats such as ostrich or emu. "It's not such a foreign thing to eat — a lot of people have tried elk. That's a big advantage."

Both Hartkopf and Winter direct-market meat and say demand is strong for prime cuts, which sell for up to \$20 a pound. "Everybody wants steaks, and that's the most expensive cut," Hartkopf says.

The bigger challenge is selling burger and trim, which account for about 60 percent of the carcass. This fall, Winter started marketing elk jerky and sticks made from his excess ground meat. "If we're going to be in the meat business," he says, "we need to sell the whole animal."

## Bullish on elk

Domestic elk faces tough competition from imported red deer, which is less expensive. "New Zealand exports a significant amount of venison to North America — about 1,100 tons a year," Hartkopf says. "The market is there, but it's being served by New Zealand."

Despite these challenges, producers are optimistic about the elk industry. Zebarth expects the velvet antler market to rebound, although "I don't think we'll ever again see the prices we saw in the early '90s." Meanwhile, the industry is developing benchmarks to assure high-quality, uniform meat products.

Most important, she says, state producers are committed to establishing markets for meat. Winter agrees: "That's the number one thing we need to grow the industry." ■

## AURI at work

Services AURI provided to the Minnesota Elk Cooperative include:

- Market assessments and business development
- Marketing video



# Lamb from the East

PHOTOS BY ROLF HAUGBERG

Minnesota lamb producers see convenience foods as a means to survival



BY E. M. MORRISON

Prairie Lamb Cooperative is bringing the taste of the East to a Minnesota grocery near you.

The subtle flavors of northern India and Morocco have inspired the co-op to produce three gourmet convenience foods being test-marketed in the Twin Cities. The ethnic dishes, made with Minnesota lamb and chicken, represent six years of market research and development.

## Prices in perpetual slide

Prairie Lamb Co-op, a group of 35 central and southern Minnesota growers, formed in 1995 in response to falling meat prices. "We met at what was then a low point in lamb prices," says Belview farmer John Essame, the co-op's president and a former instructor in the lamb and wool program at Ridgewater Technical College in Willmar, Minn.

Since then, lamb prices have slipped further, continuing a decline that has cut the sheep industry more than 80 percent since World War II. In 1942, there were 56 million sheep in the United States, according to the Minnesota Agricultural Statistics Service. Today, there are

fewer than seven million.

Lamb consumption in the United States has also declined, dropping from two pounds per person in 1970 to one pound in 1990. By comparison, annual turkey consumption over the same period doubled, rising from six pounds per person to 14.

While the poultry, beef and pork industries have all developed convenience products over the last 30 years, the lamb industry has failed to innovate, Essame says. At any supermarket, "there are feet and feet of value-added meat products — stuffed, seasoned, marinated, cooked." But lamb is still sold as a "chunk of meat." If available at all, it is likely to be traditional cuts such as leg of lamb or lamb chops.

## Blinded by the British

During sheep tours of the United Kingdom in the early '90s, co-op members saw some creative ways to cut and merchandise lamb and resolved to bring those ideas to Minnesota. They held a lamb-cutting workshop at the University of Minnesota, taught by experts from the British Meat and Livestock Commission, and organized a

marketing group to sell the new cuts.

But when they pitched the products to upscale supermarkets, they discovered they'd gone down "a blind alley," Essame says. Although retailers "were impressed with the products we brought in, the effort we had made, they regretfully told us we had wasted our time." The co-op's products could easily be copied by grocery store meat departments, bypassing the lamb cooperative.

## Teams to the Twin Cities

In 1998, Prairie Lamb changed direction, seeking to market lamb as an ingredient in processed foods.

Assisted by AURI and the Minnesota Department of Agriculture, the group surveyed more than 50 Twin Cities restaurants, looking for the most popular lamb dishes. Then they sent teams of four to 20 restaurants for taste tests. Teams completed a questionnaire about each dish, detailing ingredients, preparation, appearance, aroma, flavor, texture and presentation. The information helped Prairie Lamb identify dishes that could be successfully manufactured.



PHOTO BY DAN LEVKE

The winners? "Indian and Mediterranean cuisine," Essame says. Not a surprise, he adds, "because these are the regions where lamb is a predominant meat."

To develop authentic dishes in these food traditions, the co-op turned to AURI scientist Charan Wadhawan. She worked with the group for 18 months to create four lamb recipes with northern Indian and Moroccan flavors. Recognizing that lamb has a limited following in this country, the group also created two Indian chicken dishes.

## True-blue Indian

The co-op chose three recipes to test market: Lamb Rogan Josh, a traditional dish from northern India, with onions, garlic, tomatoes and sour cream; Lamb and Apricot Tagine, a traditional Moroccan dish with apricots, dates, orange juice, onions and garlic; and Chicken Lajawab, an Indian recipe using onions, tomatoes, garlic and yogurt.

Wadhawan, who grew up near New Delhi in northern India, says these recipes capture the genuine flavors of the east, incorporating spices such as ginger, cumin, turmeric, coriander, cilantro and garam masala, a blend of spices common in India. "I haven't seen any other Indian-style lamb dishes like these in stores," she says.



Wadhawan helped co-op members cook about 400 servings of each dish at a federally inspected processing plant in Cannon Falls. The entrees are packaged in 12-ounce freezer trays ready to heat and serve.

## Chaat-na means delicious

This winter, the new frozen foods are being marketed in Twin Cities grocery stores under the brand name "Chaat-na," a Hindi word for delicious. The customer for Chaat-na dishes, which sell for about \$4 per serving, is "affluent, well-traveled, drinks wine with meals, entertains and eats out a lot, and is interested in new foods," Essame says.

If Chaat-na wins a following, Prairie Lamb will hold an equity drive later this year and prepare for commercial production and distribution. It's taken the co-op six years and about \$125,000 to reach this point. Essame, who led the effort along with sheep producers Joel Hasslen of Kimball and Janet McNally of Hinckley, says ventures like this could help reverse the industry's long decline: "I think we are now in a position to come to producers with a product that could keep them in the lamb business." ■

## AURI at work

### Services AURI provided Prairie Lamb include:

- Meat-cutting workshop grant
- Market research and assessment
- Recipe development, testing and scale-up
- Nutrition information
- Product labeling and packaging
- Ingredient sourcing
- Co-packer assistance



# Co-op strikes oil

## Minnesota co-op to refine soy oil for pharmaceutical and biodiesel markets

BY DAN LEMKE

*Glennville, Minn.* — Some 500 southern Minnesota farmers are planning to pump an array of high-value products from soybean oil — from nutritional supplements to diesel fuel.

The members of SoyMor soybean cooperative have begun purchasing crude soy oil and refining it into products for personal care and nutraceutical markets. They are toll processing now but hope to start their own production and triple volumes by next summer.

"Eventually we hope to have a complete crushing plant," says SoyMor President Roger Peterson. "But we're going about it in a different way by starting off with higher value things first."

### Prime the soy pump

SoyMor focuses on soy components such as sterols, glycerin and lecithin. "They've been able to identify a technology and process to separate, concentrate and purify several lecithin components to pharmaceutical grade," says AURI scientist Max Norris. "When they look at a bushel of soybeans, 95 percent of what's in there isn't where their interest lies."

By purchasing readily available crude oil and sharing resources and facilities with Agra Resources Cooperative's Exol ethanol plant in Albert Lea, SoyMor will be able to build markets before expending funds on a crushing plant.



PHOTOS BY ROLF HAGBERG

Peterson explains that businesses often "fail because you can't market your product. We're building our markets first."

### Let biodiesel flow

Refining soy oil components is not all SoyMor has in the works. The co-op is also making plans for a biodiesel plant.

Peterson says the co-op is watching what happens as the Minnesota Legislature once again debates whether a percentage of biodiesel will be required for diesel fuel sold in the state. Such a mandate would be a boon to soybean growers and processors.

Federal funds from the Commodity Credit Corporation also gave SoyMor a boost this fall. The co-op was one of 12 recipients of a biodiesel feedstock buy-down for renewable energy initiatives. SoyMor is using its funds to purchase soybeans for processing.

Once a plant is built, it will be relatively small, capable of processing seven million bushels per year. Nevertheless, Norris says this could be a shining example of value-added agriculture: "This could be a mega-resource for the state. They'll be utilizing those bushels to the point where there's nothing left of the raw commodity when they're through with it." ■

PART ONE OF A SERIES

# How AURI works

**Editor's note:** This is the first installment in a series that explores AURI — who it helps and the services it provides Minnesota. This first segment surveys AURI's mission and projects. Future installments will cover AURI client services, regional offices, pilot plants, laboratories, research and development focus areas, and how the institute is managing emerging agricultural opportunities.

BY CINDY GREEN

As a bushel of corn travels from harvester to elevator to processor to packager to retailer — with a transporter at every step — the price climbs. “Each step, from processing to marketing, doubles its cost,” says Edgar Olson, AURI executive director. “That’s how five cents worth of wheat turns into two-dollar bread.” The trick for Minnesota, he says, is to capture as much value as possible before the corn, or any other commodity, leaves the state.

That is AURI's mission.

For the past 12 years, the state-funded nonprofit institute has been helping businesses and agricultural groups develop new uses and markets for traditional and alternative commodities. Every project gets Minnesota closer to realizing the potential of the state's abundant ag resources.

“We can't eat everything we grow, Olson says. “So do we, for example, grow corn only for food or should we also grow it for energy? We can ship it out, but once it hits the barge or the train or the truck, we've lost an opportunity. ... If we can turn it into ethanol or biodiesel or any other use, we have that freight advantage because we can market it right here — it doesn't have to be shipped to the East Coast, West Coast or Gulf.”

## Higher prices, more profits

Adding value in-state reaps benefits for farmers in two ways, Olson explains. “If you create additional demand and value, eventually that will come back as increased commodity prices.” Also, by involvement in value-added ventures such as ethanol or food processing, the producer “gains more control farther down the processing chain.”

“However, an individual producer needs capitalization,” Olson says, “not only for his production enterprise but also his processing enterprise. There are other players we can

bring in so the producer can share ownership (such as in farmer-owned cooperatives).

“The closer to the production you can do the processing, the better off you will be financially. It's better to finish, manufacture and ship a processed product than a raw commodity.”

## Is size an issue?

To boost commodity utilization and in-state processing, AURI has supported a wide range of projects — from a family-owned cheese-making shop to a 500-member soy oil refining cooperative. “We like to think that we don't say no to anybody — but we do have focus,” Olson says. “The important thing is, how much commodity does it consume?”

“We have projects all the way from roadside stands and a guy doing his own manufacturing and direct marketing to those selling in Sam's Clubs and Targets. Sometimes we help individuals who love their work, love their project, but don't have an interest in huge volumes.”

Small food entrepreneurs frequently ask for AURI's assistance. Typically, they make specialty foods from natural, homegrown ingredients — flavored honey, ethnic sausages, rhubarb jam, soy snacks, lefse mix.

While AURI may not provide major assistance to a small food entrepreneur, the Institute's food lab and pilot plant in Crookston and meat lab in Marshall can help with ingredient analysis, scaling-up recipes for commercialization, initial processing, packaging, labeling, food safety training and other services. “These services may make the difference over whether a business gets going,” says Kai Bjerkness, AURI planning and development director.

At times, the help may come in exposing the harsh realities of marketing. “If someone



comes to us with a salsa recipe they love and all their family and friends say 'It's great; you should sell it,' we ask, 'Do you want to eat, drink and sleep salsa for the next 10 years? Because that's what it will take.' If someone really wants to build a product and a company, they have to be prepared.”

## Beyond food

Innovative nonfood projects, such as starch-based packing peanuts, wheat-based cat litter and soy-based lotions and candles, can eventually increase commodity demand. Some emerging industrial projects with even higher potential impact include soybean crushing in southeast Minnesota and small-grain ethanol processing in northern Minnesota.

Energy and coproduct utilization are major focus areas, not only in AURI client assistance, but the Institute's internal research and development. “The ethanol industry has come of age,” Olson says, and is not only producing energy but distiller's grains, an ethanol byproduct that can be used in livestock feed.

“Now we're looking at biodiesel blended with ethanol (see story, page 3). If we can use the energies we produce in our fields to fuel our tractors and trucks and trains — it's just that much less we have to import,” Olson says. AURI, through its coproduct utilization program and pilot plant in Waseca, has assisted in such projects as turning livestock waste into energy via anaerobic digesters, a poultry litter power plant and furnaces that burn agricultural waste.

## A world of alternatives

Alternative crops and livestock also play a role in adding value to farm production. When farmers switch from supplying mainstream commodities to the market for raising alternatives, their more traditional colleagues may see higher commodity prices as a result.

Alternative livestock operations may generate good income for those farmers willing to take the risk. Livestock that AURI recently investigated include lamb, elk, goats and bison. Crop alternatives also can be profitable, such as cranberries, organic dairy



Edgar Olson, AURI executive director, at a northern Minnesota cranberry bog.

PHOTOS BY ROLF HAGBERG & KAY MITHAUGEN

## AURI's mission statement

AURI was created to foster long-term economic benefit through increased business and employment opportunities to rural Minnesota through:

- the identification and expansion of existing markets for new or existing commodities, ingredients and products;
- the development of new uses or value improvements for Minnesota agricultural commodities; and
- the development of more energy-efficient, natural resource-saving production practices.

products, hazelnuts, herbs, shiitake mushrooms — especially when entrepreneurs process specialty crops into gourmet or ready-to-eat foods.

### Feasibility first

Most of AURI's work is in technical assistance and feasibility analysis. "You can do almost anything, but is it feasible and practical? Where can you be competitive?" Olson says. Services are provided at AURI's regional offices in Morris, Marshall, Waseca and Crookston, where AURI is also headquartered.

"We have staff who have an immense amount of experience in product development and technical assistance," Bjerkness says. Though marketing help is not AURI's role, it may be

the piece that has to be addressed before a project is deemed feasible. "We focus on due diligence and some of that involves marketing. There are three legs of the stool — product, finance and marketing. If you don't have all three, you're going to have problems."

If a business is missing a leg, it "has to have some advisors, a board, something that can help steer the ship. That may mean bringing in financing or marketing help."

AURI also helps innovators hook up with organizations that have resources in specific research, business development or agricultural production needs, such as the University of Minnesota, State Universities, Minnesota Department of Agriculture, Department of Trade and Economic Development, local development specialists

or private consultants. At times, AURI may help fund those outside services.

Though there are many methods to AURI's mission, the desired outcome is the same: use commodities, increase value, and generate more income for rural Minnesota. To that end, AURI still has plenty of work to do. ■

BY JENNIFER PENA

Want to be “chock fuel” of information on alternative ag-based energy? Speed to these selected Web sites — information ranges from do-it-yourself biodiesel to political resources to fun games. AURI’s site has a biodiesel section as well, so take a few minutes to drop by [www.auri.org](http://www.auri.org).

### Not a couch potato

[www.veggievan.org](http://www.veggievan.org)

The veggie van’s a vehicle fueled with used oil from fast food restaurants, and this is a site dedicated to vegetable and used oil-based fuels. Attend a workshop on how to convert a diesel engine to run on 100 percent vegetable oil. Or order “From the Fryer to the Fuel Tank,” a basic how-to on making your very own biodiesel. Or just sign up for a free e-newsletter and join the discussion forum.

### Facts on biodiesel

[www.greenfuels.org](http://www.greenfuels.org)

If you’re looking for to-the-point information on biodiesel and ethanol, the Canadian Renewable Fuels Association contains a Biodiesel Information Centre site. It’s small, but includes fact sheets on ethanol manufacturing, quality and retailing, and biodiesel marketing and producers. “What’s New” contains a selection of articles about the alternative fuels industry and information on ag fuel development in Canada.



### Where’s the E-85?

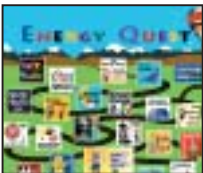
[www.afdc.nrel.gov/altfuel/bio\\_general.html](http://www.afdc.nrel.gov/altfuel/bio_general.html)

The Alternative Fuels Data Center covers the bases. Find where fleet managers can purchase alternative fuel vehicles, regulations on alternative fuel use, a list of locations to purchase fuels such as E-85 and M-85, or surf newsletters and magazine articles for more information. Can’t find what you need online? Call the National Alternative Fuels Hotline, or fill out their request form and get a response in a day or two.

### Kids on a quest

[www.energy.ca.gov/education/index.html](http://www.energy.ca.gov/education/index.html)

Energy Quest is a kaleidoscopic page with stories and science projects for kids of all ages. Young and young-at-heart alike can find coloring pictures, write to an advice



column about energy saving or do crosswords and other puzzles. Each science project contains a list of supplies and directions. Kids can build a battery with “lemon power” or make their own lightning, for instance.



MONITOR PHOTO COURTESY APPLE.COM, PIGLET PHOTO COURTESY ARC

### Save on the light bill

[www.consumerenergycenter.org/index.html](http://www.consumerenergycenter.org/index.html)

Whether you’re trying to cut the light bill or choosing the right windows for energy performance, the California Energy Commission has answers on its Consumer Energy Center site. The site not only offers help on conserving energy, but also lists programs for rebates, grants and loans, and contains a glossary of terms and an energy bookstore. A well-rounded resource for consumer energy issues.

### Biomass info clearinghouse

[rredc.nrel.gov/biomass](http://rredc.nrel.gov/biomass)

The Biomass Resource Information Clearinghouse provides high-quality biomass resource data for the United States to the

energy community. The goal is to create an atlas of resources — developing a national database on how much biomass is available, county by county. BRIC offers documentation and meeting notes from the Biomass Resource Assessment Task Review, a search engine, resource maps and — soon — classified ads.

### DOE biofuels resource

[www.ott.doe.gov/biofuels](http://www.ott.doe.gov/biofuels)

The U.S. Department of Energy has created a site covering a range of biofuel-related topics, including history, legislation, resources and market issues. The Biofuels Information Center portion accesses information about the R & D efforts of the National Renewable Energy Laboratory, including photos, publications and recent news.

### Trees and plants

[bioenergy.ornl.gov](http://bioenergy.ornl.gov)

The Bioenergy Information Network is the place for information about fast-growing trees, grasses and ag residues for fuels and power. They’ve sponsored research, development, demonstration and commercialization activities to encourage biofuels in transportation. Browsers can search through BIN’s publications, visit the forum discussions, read info on their programs and research, or peek at their image gallery.

# Elsewhere in ag utilization

BY JOAN OLSON

*Editor's note: As a service to our readers, we provide news about the work of others in the ag utilization arena. Often, research done elsewhere complements AURI's work.*

## Bioplastic harvest

John Deere 2002 combines will feature new soy-based polymer and soy- and corn-based resin panels. The new materials were developed in part by soybean checkoff funding and the United Soybean Board.

Source: Doane's Agricultural Report, August 10, 2001

## Pulp reality

An Iowa company is making paper from cornstalk fiber. Mells Industries in Des Moines combines 50 percent cornstalk pulp with a mixture of recycled wood pulp, softwood pulp and cotton to make paper. Mells plans to build a plant to process 300,000 tons of cornstalks a year and put an estimated \$10 million in the pockets of nearly 200 local corn producers.

Source: The Furrow magazine, September/October 2001

## Farmers milk Wisconsin tourism

Dennis and Roxanne Schopf, owners of Hilltop Dairy in Door County, Wis., recently doubled their herd and made ag tourism an integral part of their expansion.

In addition to a high-tech milking parlor, their operation now features a visitor center/classroom fitted with TV monitors, a 28-foot window-wall to the milking parlor, a country store and a dairy bar where the Schopfs sell fresh ice cream. There is also a life-size cow replica to "milk," videos about milk production and a corn maze.

Source: Ag Partners, October/November 2001

## A soybean in your tank

United Energy Distributors has opened a service station offering soy biodiesel in Aiken, S.C. Consumers can fill their tanks with soy-based biodiesel, E-85 or other alternative fuels.

Some fueling stations in San Francisco, Calif. and Sparks, Nev. are offering pure biodiesel. According to the National Biodiesel Board, 13 biodiesel suppliers are now registered with the Environmental Protection Agency, up from just two in 1996.

Source: www.biodiesel.org

## Chewing the film

A University of Illinois researcher has designed a biodegradable corn zein film that is water resistant. For use in hay coverings, the film is safe for the environment and is edible for livestock.

Source: Progressive Farmer, August 2001

## Ethanol on the march

The ethanol industry is on track to produce a record 1.8 billion gallons in 2001. The industry will also set a new capacity expansion record this year. There are 13 ethanol plants under construction and 57 plants in operation. According to a California Energy Commission final report, U.S. ethanol production capacity is projected to reach over four billion gallons per year by the end of 2003.

Source: www.ethanolrfa.org

## Cash for value-added research

A \$5 million multi-state grant to establish an Agricultural Marketing Resource Center will be administered by Iowa State University Extension. The center will link university scientists with outreach specialists to analyze markets and design research for value-added agriculture.

The center is a consortium of Iowa State University, Kansas State University, the University of California and Oklahoma State University. Its mission is to provide ag producers and processors with knowledge-based resources to better compete in the global marketplace.

Source: Mary Holz-Clause, Extension Value-Added Agriculture Program, (515) 294-0648, mclause@iastate.edu



## Taste buds can read

In a study conducted in three Midwest urban retail groceries, labels were shown to influence taste. Consumers were asked their preference of a tender versus tough steak. The first group relied on their own taste without labels; the second group was served labeled steaks. The study found 69 percent preferred the tender selection when relying on their own taste. But 84 percent preferred the "tender" steak when choices were labeled. "Providing consumer information affected shoppers' choices," says Ted Schroeder, Kansas State University agricultural economist.

Source: Kansas State University news service

## Breeding edamame

Ohio State University researchers are crossbreeding to develop new edamame varieties. Edamame is an edible soybean, originally from Asia. Researchers want to produce a tasty variety with higher oil and protein content. They are field-testing 10 varieties and breeding 136 more in the greenhouse. OSU's Ron Fioritto says Ohio has a potential edamame market with the state's large Asian population.

Source: Ron Fioritto, (330) 263-3851, fioritto.1@osu.edu

## Can ethanol roll a lucky seven?

The ground has been broken for a corn ethanol pilot plant at Southern Illinois University-Edwardsville. Ten projects have been identified with the potential to reduce production costs. If just seven of these technologies are sped to commercialization through the pilot plant, the cost of converting corn to ethanol could be reduced by up to 10 cents a gallon.

Source: www.siu.edu and www.ethanolrfa.org

## U.S. soy greets Asia

This fall, consumers in India were introduced to Nutri Besan, a 20-percent soy flour. The flour was developed and marketed by Taiwanese and Indian soy food processors, with a nudge from the American Soybean Association.

Another project has had customers of Taiwan's 2,800 7-Eleven stores snapping up hot tofu snacks called "Lucky Sacks," for nearly a year. Since some customers might simmer them in water too long, the hot-pocket-style snack must hold together for seven hours — only U.S. food grade soybeans give the tofu that functionality.

Source: Theresa Miller, Illinois Soybean Association, (309) 663-7692.

## Please, sir, may I have some milk?

Results of a five-month study conducted in middle and high schools in five major U.S. markets demonstrate strong interest in vended milk.

Conducted by the national "Got milk?" campaign, the study revealed that many students would choose milk over other beverages if it were convenient and available. With widespread school milk vending, the estimated increase in milk consumption would be 16.3 million gallons, or four percent per year. The key is to have milk available in branded, single-serve packaging with a variety of flavors and fat levels.

Source: www.dairyinfo.com; an executive summary is available at www.idfa.org/mktg/gotmilk.htm



ILLUSTRATIONS © UNCLE HYGGLY

"I feel good about helping small to medium-size plants. (They) need help in distinguishing and differentiating their product." — Warner Ide

## A tender treatment

### Rinse and chill technology continues to prove its claims on beef

BY GREG BOOTH

When ensuring the safety of beef, why not try a little tenderness?

Both are promised by Meat Processing Services Corporation of St. Paul, a company pioneering a beef process called rinse and chill. Recent trials in AURI's Marshall meat lab and at the University of Minnesota back up processors' and chefs' claims of improved tenderness, appearance and safety for beef treated with the patented technology.

Known also by the less appealing term "vascular flushing," the process cleans beef carcasses with a water-based solution to lower pH in the muscle tissue. AURI tests have shown the technology also reduces bacterial contamination and cholesterol while extending the meat's shelf life, says AURI meat scientist Darrell Bartholomew.

Rinse and chill is already in place at G&C Packing, a large packing plant in Colorado Springs, Colo.; Booker Packing in Booker, Texas; and the M.C. Herd packing plant in Geelong, Australia. Major packing plants in Minnesota and California are currently considering the technology for their lines.

"We've passed through commercial trials successfully and we've made a favorable impression on USDA," says Warner Ide, MPSC's vice president and COO. "There's less blood contamination throughout the plant as a result of rinse and chill. The tissues are cleaner, making pathology easier to see. There will be new science and new data coming out that will add to that excitement and enthusiasm."

### Give 'em the chilled shoulder

Much of that enthusiasm comes from chefs in Green Mountain Falls, Colo., and Larchmont, N.Y., who are serving G&C's Manitou Beef brand steaks. Bonnie Briar Country Club executive chef Marcus Guiliano calls the meat "tender and juicy." Black Bear Restaurant owner Victor Matthew features "Cold-Rinsed Manitou Beef" and touts the technology as "the first major breakthrough in meat production and processing in perhaps a hundred years."

Brand-name steaks are marketed to Colorado consumers as "flatirons" and "Frankie filets," tender shoulder and chuck cuts that would have sold as ground beef before rinse and chill was introduced. The Western Livestock Journal recently reported that Manitou Beef shoulder cuts were selling at \$6 per pound as flatiron steaks, and chuck cuts were selling at \$4.50 per pound, marketed as "Colorado Strip" steaks similar to New York strips.

In Minnesota, customers at Lunds and Byerly's stores can purchase Rocky Mountain Natural Meats Great Range bison meat, processed using rinse and chill. The bison meat's shelf life is extended five days with the technology, according to Ide.

### A good hard look

Summer 2001 trials included processing 20 head of Angus beef at G&C Packing, Bartholomew said. One result was "decreased cholesterol levels in the muscles, and we had a bigger effect in the muscles of the chuck than expected," he says. Also, a reduction in *E. coli* 0157:H7 was found in inoculated ground beef samples in the rinsed and chilled beef, compared to inoculated control samples. That contaminant is "the big issue in ground beef," Bartholomew says.

University of Minnesota sensory tests show that rinse and chilled shoulder clod steaks rated better on tenderness, flavor, juiciness and "overall liking" than control steaks. Also, chuck and round steaks rated well on texture and juiciness. "Chuck roll steaks appeared to



ART BY UNCLE HYGGLY

be less tough," than the control group, Bartholomew says.

Bartholomew and researcher Brian Rueter are working with researchers at PM Beef Group in Windom, Minn., J&B Wholesale in St. Michael, Minn., the Minnesota Beef Council and the University of Minnesota. Rueter is completing studies on color in rinsed and chilled beef. AURI lab assistant Karen Fennern is also assisting the research.

PM Beef's Rick Carlson, vice president of operations in Kansas City, says the company is "taking a good hard look" at rinse and chill because of the "claims to tenderness, lower microbials and food safety. ... We want to take the high-quality Minnesota product we have now and enhance it."

As processors such as G&C already claim, the technology helps both producers and packing plants, Bartholomew says. "The rinse and chill process can be used on older cattle like cull cows to improve the meat quality." Rinse and chill will also make "more meat available for

whole muscle cuts, so it would be an economic benefit to the processor."

### Rescue the little guys

Ide champions the technology as a savior for economically troubled small to mid-size packing plants and as a logical choice for safety-conscious consumers who might otherwise shy from beef. The rinsing adds about three minutes per carcass to the processing line, a time factor that large packing plants may not find economically acceptable.

"We will flow like water and go where opportunity leads us," Ide says. "I feel good about helping small- to medium-size plants. These little guys need help in distinguishing and differentiating their product."

Ide thinks "dozens of plants will be adopting (rinse and chill) in the next few years." And of course he has no opposition to outfitting larger plants: "They're all in a position to benefit from this technology." ■

## How rinse and chill works

Immediately after the animal is stunned, a cooled solution of water, sugar and salt is injected into the arterial system. The solution replaces arterial blood as it circulates throughout the carcass. By lowering muscle tissue pH, the solution keeps the meat a desirable red color. The acidity that develops in the carcass also helps to tenderize the meat.

By removing blood so quickly, the process also reduces the risk of contamination, especially in the hide removal process. Research has shown a 99 percent reduction in Coliform bacteria on the carcass surface when using the rinse and chill technique. ■