

Competitive Agricultural Systems in a Global Economy

SCIENCE & EDUCATION
Impact

Benefits from USDA/Land-Grant Partnership

New Uses for Corn

Bringing new dollars, solving old problems.

A rose is a rose is a rose, but corn can be a salt, a medicine and a meat sanitizer. U. S. Department of Agriculture (USDA) and Land-Grant university scientists are finding new uses for agricultural commodities and byproducts, helping the environment, benefiting human health and putting a dollars into the agricultural economy.

Payoff

- **Skin cancer protection from a cactus.** Arizona researchers went to the sunniest place on Earth to find a substance that can protect people against skin cancer. Working in collaboration with other universities and pharmaceutical companies, scientists found certain compounds in desert plants that help treat and prevent skin cancer. Two patents are pending and several other compounds are being tested for pharmaceutical uses.
- **Healthy salt.** A Michigan State scientist created an improved salt substitute from corn. HälsöSalt™ sprinkles, dissolves and cooks just like salt, but it lacks the bitter aftertaste of conventional salt substitutes. The product offers consumers a tasty way to reduce their sodium intake and gives corn farmers a new market. Michigan State has a U.S. patent pending on the product, and owners of Randall Health Foods in Lansing, Michigan, report that HälsöSalt™ (Swedish for healthy salt) is selling briskly.
- **Corn cures earaches and stops cavities.** Xylitol, made from corn fiber, is a sugar alcohol sweetener that helps prevent tooth decay and ear infections and is a safe sweetener for diabetics. Virginia Tech researchers are screening various bacteria to identify organisms that rapidly produce large quantities of xylitol. Corn fiber now is primarily used as a component in animal feed. Developing xylitol could boost corn fiber's value from as little as 5 cents per pound to as much as \$2 per pound. About 4 million tons of corn fiber is produced from the corn wet milling process alone each year.

Clean meat. Research at Missouri and Iowa State helped develop uses for Polylactic Acid (PLA), made from corn. Used as a meat sanitizer that prevents growth of bacteria such as *E. coli*, PLA reduces pathogens more than tenfold when applied to meat carcasses. A PLA plant built in Nebraska is expected to raise the value of corn by more than 10 cents a bushel.

- **Solving a hull of a problem.** Harvest an acre of rice and 20 percent of what you get is hulls. Arkansas researchers are finding new uses for rice hulls to add value to the crop and to solve a significant disposal problem. When rice millers burn hulls, they get a high-silica ash. Researchers found that rice hulls burned at lower temperatures can be used to make a powdered silica gel. This gel can be used as an adsorbent in chemical, food and pharmaceutical processing; in silicate blocks, used for drywall in buildings; and in silicate plastic sheets, similar in texture and flexibility to polypropylene.
- **Little Miss Muffett eats sausage.** Food processors can generate a lot of wastewater. One major dairy plant in Ohio was discharging 186,000 gallons of whey wastewater daily,

exceeding EPA limits. **Ohio State** researchers found tasty uses for whey, from chocolate milk to a low-fat sausage. They glean the whey protein concentrates from wastewater through ultra filtration and tailor these for specific foods. The plant now meets EPA limits.

- **Fill 'er up in the forest.** Bacteria may help solve fuel shortages. **Kentucky** scientists are studying the use of anaerobic bacteria to convert fibrous biomass — from crops, trees and municipal solid wastes — into ethanol and other value-added chemicals. These bacteria ferment fibrous materials into chemicals, eliminating the need for expensive pretreatment procedures. The scientists have characterized several genes involved in this bioconversion and plan to engineer organisms to better convert fibrous material into chemicals.

Ah, sugar. Ah, polysugar. Louisiana's \$300 million sugar crop is getting a boost from **Louisiana State** scientists. They found that a polysugar, made from sucrose, offers significant market potential as a replacement for antibiotics in animal feed. The product has a potential market value well into the billions. Animal testing is the next stage; research has begun with chicken feed. The result should be a safer, antibiotic-free bird.

- **Fish yogurt.** Finding uses for seafood waste would help the environment and the food industry. **Cornell** researchers are examining the uses for gelatin made from fish bones and skin in products such as yogurt, ice cream, candy and low-fat margarine. Fish gelatin, which neither tastes nor smells fishy and was preferred by a sensory panel over pork gelatin, is the only gelatin that melts at a temperature below that of the human mouth. Another benefit: fish gelatin can be made kosher or halal. Currently, gelatin for kosher and halal food production is hard to find. Consequently, as the need for more kosher and halal products for both domestic and international trade increases, fish gelatins will become more valuable.
- **Canola for your crankshaft.** A new canola motor oil developed by **Colorado State** Extension and a Colorado Springs-based company is good for the environment from the time it's produced until it's recycled into new uses. When the canola oil is made, 30 percent fewer hydrocarbons are produced when compared with petroleum-based oils. The oil can be recycled into greases and chain oils. It's easy to dispose of since it is not petroleum-based or hazardous. Now, Thumb Oilseed Producers Cooperative, a Michigan-based soybean producer-owned cooperative, is producing the oil for commercial use. The environmental benefits come with a slight cost: consumers who switch to the vegetable-based motor oil will pay about \$10 more a year per vehicle. If canola oil replaced just 5 percent of the petroleum motor oil used today, the United States market for the oil would be roughly 50 million gallons.

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Cooperative State Research, Education, and Extension Service in cooperation with the Extension Committee on Organization and Policy, the Experiment Station Committee on Organization and Policy, the Academic Programs Committee on Organization and Policy, the International Programs Committee on Organization and Policy, and the Louisiana State University Agricultural Center.

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• April 2000