

SCIENCE & EDUCATION Impact

Benefits from USDA/Land-Grant Partnership

Disease Fighters

Tackling health threats to animals, people, and the food supply.

Human and animal diseases threaten to rob Americans of their health, economic well-being, and quality of life. The USDA and land-grant partnership helps protect human and animal health through comprehensive efforts that range from educational programs that teach food safety principles to applied and basic research. Studies have shown that every public dollar invested in these research programs returns \$10 or more in benefits.

Payoff

- **Nipping at West Nile virus.** Researchers at **Iowa State** are finding that a perennial herb in the mint family just may be the cat's meow as part of a growing national response to the West Nile virus' spread. Their laboratory tests show that catnip oil keeps mosquitoes off people significantly better than DEET, the compound used in most commercial bug repellents. Researchers are investigating other natural repellents to prolong catnip oil's effectiveness. In **Washington**, no horse, bird, or human cases were reported in 2003, thanks in part to Cooperative Extension's awareness efforts. Heightened surveillance and improved responses aimed at protecting human and animal health continue at **Colorado State, Delaware, Florida, Georgia, Kansas State, New York, Louisiana State, Ohio State, Penn State, South Dakota State, Tennessee**, and other states.
- **Many happy returns.** Good basic cattle herd health practices don't cost; they actually pay for themselves. **Georgia** research shows that every \$1 spent on basic herd health nets a \$7-\$10 return in improved calf performance. **Nebraska** scientists developed a calving system that reduces newborns' exposure to the germs that cause scours, or diarrhea. One rancher said the system saves him up to \$50,000 annually. **Kansas State** researchers found that feeding flaxseed improves cattle's health and carcass quality. **Kentucky, Mississippi**, and others are conducting research that improves cattle health and saves money for cattlemen.
- **Improving food safety.** Foodborne diseases cause more than 5,000 deaths and countless illnesses each year. Molecular tests conducted on farms and feedlots have helped researchers in **Nebraska, South Dakota**, and **Ohio** pinpoint the presence of foodborne pathogens before they reach the consumer. **Nevada** scientists tested

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eight ranch sites and recommended control measures for helping to shield the food supply from pathogens.

- **CLA is A-OK.** It's a fatty acid with a funny name, but dairy producers and consumers sing its praises. Conjugated linoleic acid (CLA) has created a potential niche market for milk that tastes good and helps prevent cancer. **Kentucky** researchers have developed a long-term feeding diet for dairy cows that safely adds CLA to milk. **North Dakota** scientists add predetermined amounts of sunflower and canola seed to cows' diets to increase CLA in milk by as much as 20 percent. **Montana State** scientists discovered how to feed CLA-enhanced diets to add cancer-fighting and cholesterol-lowering qualities to lamb meat. As part of a multi-state project, 10 land-grant universities have worked together to develop milk, butter, and cheese with improved levels of CLA, omega-3 fatty acids, and oleic acid – all considered beneficial to human health.
- **Birds of prey.** Exotic Newcastle disease and Avian influenza, fatal viruses that affect all bird species, are threatening the poultry industry in many states. In **California**, a scientist is testing vaccines to better understand the immune status of a vaccinated flock. Her work will help develop the antibodies to kill these diseases. **Arkansas** scientists are developing procedures to more quickly recognize and control these diseases, steps they say will protect the flock's health and save the state's producers millions of dollars. **Connecticut** researchers established a surveillance program for poultry and other bird diseases and were able to protect the state's flocks from the further spread of four major diseases while reporting no outbreaks of *Salmonella* related to egg products from commercial farms.
- **Live longer and healthier.** **Colorado State** scientists recently determined that foods containing omega-3 fatty acids help slow the production of enzymes that cause osteoarthritis, a disease affecting nearly 21 million Americans. **Illinois** research shows that a drug commonly used in poultry production can prevent fibroid tumor growth in women. Current therapies are surgery or a drug with harsh side effects and limited effectiveness. The researchers report this more effective therapy could save medical costs, improve women's health, inhibit the growth of some cancers, and repair

damage to vein walls caused by the cardiac angioplasty. **California** researchers are using an animal model to establish preventive therapies for reducing the risk of lung cancer in former smokers and those exposed to second-hand smoke.

- **Safety for animals.** Researchers are using science and communications technology to stay ahead of foreign animal diseases such as bovine spongiform encephalopathy, known as mad cow disease, and foot-and-mouth disease. **Arkansas** scientists are using infrared spectroscopy to analyze beef samples more quickly and reliably than previously possible. An **Ohio State** scientist is developing a prion-detection test that uses scrapie, a disease affecting sheep and goats, as a model for detecting degenerative diseases that attack the central nervous system. One quick response was highlighted at **Iowa State**, where university television broadcasts and news releases reached farmers and consumers in at least 28 states within hours of the December 2003 announcement of the nation's first case of mad cow disease. **Colorado State, North Carolina State, Tennessee, Utah State, Wyoming**, and others are studying the potential cost and how to respond to foreign animal diseases.
- **Good news for cows.** Each year, the dairy industry loses at least \$1 billion to mastitis. **Tennessee** researchers are finding a genetic basis for mastitis. They think they can increase the number of resistant animals and improve milk quality through selective breeding. **Minnesota** scientists are using gene sequencing to develop new ways of early diagnosis, prevention, and treatment of Johne's disease, which costs the dairy industry more than \$200 million a year.



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and Extension Service
United States Department of Agriculture

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