



in 1996, the peak year, and decline in later years. However, these costs could be offset by savings to federal nutrition programs.

Opponents question the animal health, environmental and socio-economic implications of rBST use. The Sustainable Agriculture Research and Education Program (SAREP) cautions rural communities may suffer if dairies go out of business. SAREP's book *The Dairy Debate* claims that cows receiving rBST would need to eat more grain, therefore increasing feed grain acreage on which pesticides are used.

Weaver disagreed. "As milk production goes up, fewer cows are needed. Fewer cows make less manure and eat less total feed, which reduces the acreage used to produce the feed."

Mastitis, antibiotic use

Researchers have noted that more productive cows seem to experience a higher incidence of mastitis, an udder infection treated with antibiotics. Klingborg explained the risk of mastitis can be mitigated through sanitation. However, some people fear higher risk of mastitis will lead to more antibiotics, posing a risk to human health, according to Jill

Auburn, Associate Director of SAREP.

Klingborg said, "Currently, every tanker truck of milk is screened at the creamery using extremely sensitive tests for specific antibiotics. Random testing is done for a wide variety of other antibiotics."

Dairies also face economic deterrents to providing milk containing antibiotic residues. "The dairyman not only loses the day's milk, he has to pay for all the milk in the truck or milk plant that his milk contaminated," Weaver explained "It could range from \$6,000 to \$50,000." In addition to financial penalties, if a dairy is cited three times it may lose its right to sell milk.

Implementation of the testing program, regulations and economic penalties have diminished use of drugs at dairies, according to Weaver. "There are fewer drugs used; in particular, exotic drug use has declined," he said.

—Editor

Further reading:

"Safety of Bovine Somatotropin in Dairy Cows: Results and Recommendations," by Osburn, Holmberg and Weaver, the School of Veterinary Medicine at UC Davis. *The Dairy Debate: Consequences of bovine growth hormone and rotational grazing technologies*, recently published by the UC statewide SAREP program; *Maintaining the Competitive Edge in California's Dairy Industry, Part II* by L. J. Butler.

Science briefs

■ Mystery disease spotted in vineyards

Several young vineyards in Napa and Sonoma counties have been ailing from a disease that has thus far stumped viticulturists.

Typical leaf symptoms include a wide range of patterns of veinal and interveinal chlorosis. In some cases, the leaves lose their green coloring and appear bleached. Marginal burning, usually in sections of the leaf, often accompanies the chlorosis. Shoot growth stops prematurely and the vines are usually stunted.

Having ruled out herbicide injury and common viruses as causes, Napa County Farm Advisor Ed Weber is planning to conduct trials this spring. According to Weber, a lack of mycorrhizal fungi in fumigated soil may be the root of the problem. These fungi play an important role in the uptake of micronutrients in grapevines' root sys-

tems, so he theorizes an unusual nutrient deficiency may be causing the disease.

"We will be inoculating mycorrhizae into symptomatic vineyards and to new vineyards planted this spring," Weber said.

■ Barley engineered

UC Berkeley plant biologists Peggy Lemaux and Yuechun Wan have introduced viral genes into barley to help the plant resist barley yellow dwarf virus. The virus, ranked among the most problematic barley diseases, weakens plants and lowers crop yields.

The researchers published the first article describing the successful barley gene insertion technique, which they developed at the Plant Gene Expression Center in Albany, in the January issue of *Plant Physiology*.

Federal permits have been issued for field tests to be held this summer in California, Idaho and Illinois.



Have you seen these symptoms?