



## Understanding Genetically Engineered Growth Hormones in Dairy

The use of growth hormones to boost dairy production is increasingly controversial. The verdict is still out about how the use of these animal drugs affects human health, but the painful consequences for animal health are well known. Consider this information as you choose the dairy products you will use.

### Farming practices can have an effect on the quality of milk

Organic farmers produce high-quality milk without the risks associated with rBST use. Use of growth hormones such as rBST is prohibited by federal law in organic agriculture, and use of the organic label is strictly regulated for food and beverage products.

#### What is rBST?

Bovine somatotropin (BST) is a protein hormone naturally produced in the pituitary glands of cattle. Monsanto developed a recombinant version, rBST, by using a genetically engineered *E. coli* bacteria. The protein produced by the bacteria is purified to produce the injectable hormone, rBST also known as rBGH.

#### How does rBST affect milk production?

rBST is known to increase the levels of insulin-like growth factor 1 (IGF-1) in cows, which can lead to increased IGF-1 in milk. ("Report on Public Health Aspects of the Use of Bovine Somatotropin," issued March 15-16, 1999, and available from The European Commission—Food Safety.)

#### What are the concerns about IGF-1 in milk?

Many studies have noted some links associated between IGF-1 levels and increased risk of cancer, especially breast and prostate cancer. (Holmes, Pollak, et. al. "Dietary Correlates of Plasma Insulin-like Growth Factor I and Insulin-like Growth Factor Binding Protein 3 Concentrations" *Cancer Epidemiology, Biomarkers, and Prevention*, Sept. 2002, p. 852-861; Chan, Stampfer, et. al. "Plasma Insulin-like Growth Factor-I and Prostate Cancer Risk: A Prospective Study," *Science*, January, 1998, p 563-566; Yu, Jin, et. al, Insulin-like Growth Factors and Breast Cancer Risk in Chinese Women, *Cancer Epidemiology, Biomarkers, and Prevention*, August 2002, p. 705-712.)

#### What other potential problems have come up?

Studies of animals exposed to rBST raise concerns about potential changes in milk protein that could lead to allergies. ("Report on Public Health Aspects of the Use of Bovine Somatotropin," issued March 15-16, 1999, p. 17, and available from The European Commission—Food Safety.)



## Farming practices can have an effect on the health of the animals

Organic farmers work to ensure their dairy animals stay healthy and productive for many years.

### How does rBST affect the animals that receive this drug?

Cows treated with rBST face a nearly 25% increase in the risk of clinical mastitis, a 40% reduction in fertility, and 55% increase risk of lameness. (*The Canadian Journal of Veterinary Research*, 2003)

### Why is increased chance of infections like mastitis a problem?

In addition to the needless suffering of the animal, increased incidence of infections could lead to increased use of antibiotics and an increased risk of antimicrobial residues in milk and to antibiotic resistant bacteria. ("Report on Public Health Aspects of the Use of Bovine Somatotropin," issued March 15-16, 1999, p.16, and available from The European Commission—Food Safety.)

The United States Centers for Disease Control and Prevention recommend "Decreasing unnecessary or inappropriate antibiotic use, in humans and animals, will decrease the resistance pressure on the treated organisms. Ongoing efforts. . .are needed. . .so that the efficacy of antibiotics is preserved as long as possible." (*Get Smart on the Farm*, [http://www.cdc.gov/narms/gsf\\_spotlight/ar\\_101.pdf](http://www.cdc.gov/narms/gsf_spotlight/ar_101.pdf))

### Is rBST allowed for use in other countries?

The product is already prohibited in Canada, Japan, Australia, New Zealand, and in the 27 countries of the European Union.

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### Glossary:

**BST and BGH**—Both describe the naturally occurring form of bovine somatotropin, or bovine growth hormone, a protein hormone naturally produced in the pituitary glands of cattle.

**rBST and rBGH**—Both describe **recombinant bovine somatotropin**, the genetically engineered form of bovine somatotropin, which is the growth hormone in cows. Sold under the brand name "Posilac," it is injected into cows to boost milk output in the short term. This practice is coming under increasing scrutiny. Posilac packaging lists many possible side effects of the drug, including reduced pregnancy rates, visibly abnormal milk, hoof disorders and a need for more drug treatments for health problems.