**Bovine Somatotropin (bST) in milk and meat**

Cattle naturally produce a hormone called bovine somatotropin (bST) that affects the amount of milk they produce during lactation. Bovine growth hormones are artificial versions of this hormone that farmers inject into cows' bodies to cause them to produce more milk.

The Facts

* Scientists use recombinant DNA technology to produce a synthetic version of the growth hormone that naturally occurs in a cow's body. According to rbSTFacts.org, this synthetic version is called by a variety of names, including recombinant bovine somatotropin (rbST), bovine growth hormones (bGH) and recombinant bovine growth hormones (rbGH).

Drug Information

* According to FDA.gov, the U.S. Food and Drug Administration approved Monsanto Company's rBST drug (called Posilac) in November 1993. Posilac is the only recombinant bovine somatotropin product approved for use in dairy cattle in the U.S.

Benefits

* Bovine growth hormones allow dairy farmers to increase their income by improving the milk production of their cows. They can decrease the size of their herds of cows and still produce the same amount of milk by using bovine growth hormones.

**Effect of Bovine Somatotropin on Cows**

Bovine Somatotropin is a growth hormone that cows naturally produce. Giving cows extra somatotropin increases their milk production and is approved by the FDA, but its use is still controversial. One cause for concern is the well being of the [animals](http://www.ehow.com/pets-and-animals/) being given the hormone.

Mastitis

* + Cows given bovine somatotropin do see an increase in mastitis, but any high producing cow has a higher potential for mastitis. Cows given somatotropin show no statistical difference from cows that genetically produce great quantities of milk.

Body Conditioning Score

* + Cows given bovine somatotropin, like other high yielding cows, are prone to low body conditioning scores since much of their caloric intake goes to milk production.

**Fertility**

* + Cows given somatotropin have reduced fertility rates, which again, is similar to cows who genetically produce high quantities of milk. This is believed to be caused by their lower body conditioning scores.

**Multiple Births**

Multiple births in cows, like in humans, are considered high risk pregnancies, and somatotropin cows, like other high producing cows, have an increased percentage of multiples. This effect can be avoided if cows are not treated with somatotropin immediately previous to and during conception.

**Ketosis**

* + When bovine somatotropin was given at five times the recommended dosage there was an increase of ketosis--a state where the body is burning fat for energy (in this case body fat) because there are not sufficient carbohydrates available to meet the animal's energy supply. This was not seen with normal dosage when animals were fed properly.

**Benefits**

* Injecting cows biweekly with bST increases milk production by 10 percent to 15 percent.

**Safety for Cows**

Regular injections of bST decrease fertility in cows. It doesn't negatively affect calf survival rates, birth weights or growth rates. In bST herds, the incidence of mastitis (inflammation/infection) of the udder is increased, which can happen with other programs that increase milk production, for example selective breeding.

**Safety for Humans**

According to the U.S. Food and Drug Administration, bST is safe for humans. When injected in people, there's no biological response. Taken orally, it's digested. In addition, pasteurization destroys 90 percent of bST in milk. The composition of treated milk (fat, cholesterol, allergens, etc.) is no different from untreated milk.

**Expert Opinions**

The safety of bST products in humans has been confirmed by many experts including the U.S. Food And Drug Administration, the American Medical Association, the National Institute of Health, the Joint Expert Committee of the World Health Organization and the Inspector General of the U.S. Department of Health and Human Services.

**Advantages of using bST**:

Increased Milk Production

* Bovine somatotropin is thought to increase milk production by increasing the blood supply to the mammary glands. This allows the cow to produce more pounds of milk per pounds of feed, which is more cost efficient to the farmer. According to a study done by Iowa State University, milk production increases by 4.8 to 11.2 lbs. daily, and the milk-per-feed ratio (feed efficiency) increases from 2.7 to 9.3 percent.

Improved Living Conditions

* For bST to be effective, the cow must be free of mastitis and disease, and nutritional needs, health services and environmental standards must all be in top form. Studies have shown that farmers implementing the changes necessary prior to beginning a bST regimen notice an increase in milk production before the drug is even given, most likely due to improved living conditions for the cows.

Reduction in Milk Prices

* As milk production increases without costing more in overhead, the supply pool increases. This forces farmers and retailers to lower prices to compete with other milk sellers, which is good news for families. The farmers still stand to gain as well by selling increased volume at slightly lower prices rather than lower volume at higher prices.

Safety

* All milk contains bST produced naturally by the cow, and milk from treated cows has shown no difference in concentration or content. When ingested orally, bST is digested fully in humans and causes no ill effects. Even when injected, bST is inactive in humans because the bovine growth hormone is different from human growth hormone by more than 30 percent. Milk from treated cows has also been shown to have a higher proportion of unsaturated fat to saturated fat, which makes it a healthier product.

Small Farm Advantage

* Smaller-scale dairy farms are able to devote more time and attention per cow, which increases the likelihood of timely bST injections and proper feed and health monitoring. This improves the results of bST treatment, yielding a higher increase in milk production. An increase in milk production per cow means that a family farm can increase the scale of their dairy business by 10 to 15 percent without the expense of additional cows.

Questions:

1. What is bSt?
2. What are the benefits of bST?
3. Write short notes on the effects of bST on cows?
4. Explain the advantages of using bST.