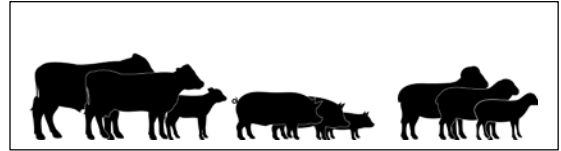


Impacts on Human Health and Safety of Naturally Occurring and Supplemental Hormones in Food Animals



The use of [growth enhancing technologies \(GETs\)](#) has improved the quality of meat products by repartitioning fat into muscle mass and reducing fat content of meat products. There are six [GETs approved by the Food and Drug Administration \(FDA\)](#) in the United States and 30 other countries for use in beef animals. Three of these are naturally occurring (testosterone, estrogen, and progesterone) and three are synthetic—melengestrol acetate, trenbolone acetate, and zeranol. In addition, bovine somatotropin is approved for use in lactating dairy cows to increase yield of milk. Oxytocin, gonadotropin hormone releasing hormone, prostaglandins, and gonadotropins are approved for use in improving reproductive performance of domestic animals.

- All of these compounds have undergone rigorous testing for human and animal safety under guidance of the FDA Center for Veterinary Medicine.

[Hormones produced by animals](#) that are involved in regulation of growth, reproduction, and other biological functions are present throughout the body and are found naturally in meat, milk, and eggs.

- In general, the [amounts of naturally occurring](#) hormones in milk and dairy products are significantly lower than production of the same hormones by humans.
- The [FDA guidelines](#) state that no physiologic effects could be expected when consumption is $\leq 1\%$ of the endogenous quantities produced by the segment of the population with the lowest daily production.
- No hormonal products are or have been approved or used for poultry production, therefore no exogenous hormonal residues exist in eggs.

Steroids, gonadotropin hormone releasing hormone, gonadotropins, luteinizing hormone, follicle stimulating hormone, prostaglandins, and oxytocin have [approval for use in cattle, sows, and ewes](#) for estrus and breeding management according to label directions.

- There is an inherent interval of days to months between use of the hormonal product and harvest for human food. For milk, there is no inherent interval between use of the products and milk consumption.

In the United States, livestock producers have used various types of GETs such as [steroidal implants](#) to improve carcass leanness, increase average daily gain, alter dry matter intake, and produce heavier weight and leaner animals when harvested at equal duration of days on feed.

- The most common and widely used type of GET are steroidal implants with anabolic activity that are used for beef cattle.
- [Beta-adrenergic agonists](#) are delivered through feed. These compounds are approved as growth regulators in cattle, swine, and turkey, and are fed during the last 7 to 42 days prior to harvest depending upon the species.
- [Melengestrol acetate](#) is used in finishing heifers as a means to combat estrous cyclicity and is also used in female breeding synchronization programs.
- [Gonadotropin releasing hormone antagonist](#) is used in beef and pork production around the world as an alternative to castration.

Perhaps the most recognized [hormone used in dairy management](#) is bST, which is naturally produced by the pituitary gland to regulate growth and lactation.

- The FDA reported that there is no legal basis requiring the labeling of milk from cows that were supplemented with rbST since the milk is [indistinguishable from milk](#) from cows not supplemented with bST.
- The FDA, WHO, and National Institutes of Health have independently stated that dairy products from rbST-treated cows are safe for human consumption.

Hormone and hormone-like products used for livestock production are [regulated in the United States](#) by the FDA.

- [Data on residues of xenobiotic hormones](#) are used to establish a no observed effect level (NOEL) which is accepted as the no observed adverse effect level (NOAEL). A safety factor is applied to the NOEL to obtain an allowable daily intake. A safety factor of 100 fold is used unless a product is believed to have potential to be a carcinogen, which uses a SF of 1,000 or greater.

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