A scientific and political noose appears to be tightening around Monsanto corporation's controversial hormone product, rBGH (recombinant bovine somatotropin), also called rBST (bovine somatomotropin). For the past 18 months, Monsanto has been aggressively marketing its genetically-engineered hormone to farmers here and abroad, to increase the milk yield of dairy cows. Cows injected with rBGH every 2 weeks produce 10% to 20% more milk than untreated cows. The U.S. Food and Drug Administration (FDA) in late 1993 declared the milk from rBGH-treated cows safe. However, new scientific studies published this summer suggest that milk from rBGH-treated cows may not be as safe for humans as was previously believed.

Political troubles for rBGH are mounting as well. Because of unresolved scientific issues related to the safety of milk from rBGH-treated cows, the international standards-setting organization in Rome, Italy --- Codex Alimentarius ---earlier this summer rejected a U.S. proposal to declare the use of rBGH safe, posing no significant health risk. In the debate at the Codex meeting, the U.S. government promoted rBGH, but the 14-nation European Union successfully opposed approval, winning by a vote of 34 to 31.[1] Other European countries besides the EU have placed a moratorium on use of rBGH, as has Canada. In June, 1995, in Canada the House Committee on Health, an all-party Parliamentary committee, unanimously called for a minimum 2-year moratorium on rBGH to examine the unresolved human health issues. The Agriculture Committee called for a similar moratorium but not limited to 2 years and limited to human health only. Monsanto is aggressively working to have such moratoriums lifted, but the newly-published scientific information seems certain to make Monsanto's task increasingly difficult.

Meanwhile back in the U.S., consumer advocacy groups (Food & Water, Inc., in Marshfield, Vermont [phone: 1-800-EAT-SAFE], and the Pure Food Campaign in Little Marais, Minnesota [phone: 1-800-451-7670]) are locked in pitched battles with rBGH-using dairies. Pure Food is using more of a scattergun approach, while Food & Water has take sharp aim at two major dairy conglomerates ---Land O' Lakes and Cabot Creamery. Both campaigns aim to force dairies to stop using rBGH. The consumer groups seem likely to get the upper hand here, as the main arguments being used by the dairy corporations are undercut by the new scientific findings.

When a cow is injected with rBGH, its milk production is stimulated, not directly. The presence of rBGH in the cow's blood stimulates production of another hormone, called Insulin-Like Growth Factor 1, or IGF-1 for short. It is IGF-1 that stimulates milk production.

IGF-1 is a naturally-occurring hormone-protein in both cows and humans. [3] The IGF-1 in cows is chemically identical to the IGF-1 in humans. [4] The use of rBGH increases the levels of IGF-1 in the cow's milk, though the amount of the increase is disputed. Furthermore, IGF-1 in milk is not destroyed by pasteurization. Because IGF-1 is active in humans ---causing cells to divide ---any increase in IGF-1 in milk raises obvious questions: will it cause inappropriate cell division and growth, causing tumors?

According to the STATISTICAL ABSTRACT OF THE U.S. (1994 edition), Americans in 1992 each consumed an average of 564.6 pounds of milk. For example, writing in the British journal, LANCET, in 1994, Monsanto researchers said "...IGF-1 concentration in milk of BST-treated cows is unchanged," and "...there is no evidence that hormonal content of milk from BST-treated cows is in any way different from cows not so treated."[7] However, in a published letter, the British researcher T. B. Mepham reminded Monsanto that in its 1993 application to the British government for permission to sell rBGH in England, Monsanto itself reported that "the IGF-1 level went up substantially [about five times as much]."[8] The U.S. FDA acknowledges that IGF-1 is elevated in milk from rBST-treated cows.[4] Other proponents of rBGH acknowledge that it at least doubles the amount of IGF-1 hormone in the milk.[9] The earliest report in the literature found that IGF-1 was elevated in the milk of rBGH-treated cows by a factor of 3.6.[10] No one besides Monsanto seems to argue that rBGH treatment of cows has no effect on IGF-1 levels in their milk.

The dairy conglomerates --Land O' Lakes and Cabot Creamery --acknowledge that IGF-1 is elevated in their milk. However, they argue that it doesn't matter. They point out (correctly) that human saliva has IGF-1 in it, and they argue that that doesn't matter either because IGF-1 is broken down during digestion.

A new study published this month shows this to be wrong. IGF-1 by itself in saliva is destroyed by digestion, but IGF-1 in the presence of casein (the principal protein in cows' milk) is not destroyed by the digestive system.[11] Casein has a protective effect on IGF-1, so IGF-1 in cows milk remains intact in the gut of humans who drink rBST-treated milk. There was reason to believe that this might be true because researchers in 1984 had shown that another growth hormone, Epidermal Growth Factor (EGF), in the presence of casein was not degraded by the digestive system.[12] However, proof had been lacking for IGF-1 until now.

So the saliva argument has been invalidated by scientific experiment. The question then becomes, what are the likely effects of IGF-1 in contact with cells of the human gastrointestinal tract? THIS IS THE QUESTION THE NIH SAID NEEDED ANSWERING BACK IN 1991. Now there are at least three relevant studies.

1. Some humans suffer from a condition called acromegaly, or gigantism, which is characterized by excessive growth of the head, face, hands, and feet. It is caused by excessive natural production of IGF-1. Importantly, a recent report indicates that people who suffer from acromegaly have an elevated incidence of tumors of the colon (a portion of the intestines).[13]

2. Two British researchers, D.N. Challacombe and E.E. Wheeler, experimented with IGF-1, exposing human cells taken from the small intestine. They report that IGF-1 induced mitotic activity ---that is to say, IGF-1 promoted cell division.[14] This is an important finding. Cancer is uncontrolled cell division.

3. As cells divide, at some point they are instructed (by their genes, in combination with hormone signals) to stop dividing or they are instructed to die so that the creation of new cells is matched by the death of cells and no net growth occurs; this is called "programmed
cell death." If "programmed cell death" is prevented, then cells don't die at the right time, causing an unnatural increase in cells--another way to make a tumor. A study published in June by Renato Baserga and others in CANCER RESEARCH reveals that IGF-1 promotes the growth of cancer tumors in laboratory animals and in humans by preventing programmed cell death.[15] This is another important finding.

Taken together, these new studies all point to the need to understand more about rBGH and its effects on IGF-1 levels in cows’ milk, and an additional need to understand what happens to the human gastrointestinal tract when it comes in contact with enhanced levels of IGF-1. The relationship of IGF-1 to cancer deserves special attention. Even researchers who are known as proponents of rBGH have recently said in print, "Many more potential effects of ingested IGF-1 on the gastrointestinal tract and the local immune system of the gut need to be explored."[16]

In the face of this growing body of scientific evidence, how long can rBGH-using dairy corporations maintain that their milk, butter and cheese are wholesome and safe beyond doubt?

--Peter Montague


[2] Reported to us by the Council of Canadians, Ottawa, Canada; phone (613) 233-2773.


[7] Robert J. Collier and others, "[Untitled Letter to the Editor]." LANCET Vol. 344 (September 17, 1994), pg. 816. Monsanto Senior Vice President Virginia V. Weldon, MD, says, "...the FDA has concluded from detailed studies that IGF-1 is not increased." See Virginia V. Weldon, "Re 'A Needless New Risk of Breast Cancer, Commentary, March 20,'" LOS ANGELES TIMES April 4, 1994, pg. 6.


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