



RAFI COMMUNIQUE

RURAL ADVANCEMENT FUND INTERNATIONAL

October, 1990

THIRD WORLD MARKETING & PROMOTION OF BIOSYNTHETIC MILK HORMONE

ISSUE: Field trials and commercial sale of BOVINE GROWTH HORMONE in the developing world.

IMPACT: Despite heated controversy and unresolved questions about economic impacts, food safety and animal health, transnational agrichemical/pharmaceutical firms have launched aggressive campaigns to market BGH in the Third World.

COUNTRIES AFFECTED: BGH is now licensed for sale in Mexico, Brazil, Czechoslovakia, Soviet Union, South Africa. Field trials in: Argentina, Australia, New Zealand, India, Japan, Pakistan, Zimbabwe, Zambia, Tunisia, Egypt, Malaysia, China.

ECONOMIC STAKES: Estimated \$500 million global market.

CORPORATIONS INVOLVED: Monsanto; Eli Lilly (Elanco); Dow; Upjohn; American Cyanamid.

What is Bovine Growth Hormone?

Bovine growth hormone (BGH) or bovine somatotropin (BST) is a naturally occurring protein which has the potential to enhance milk production in livestock. Scientists have isolated the gene which is responsible for producing bovine growth hormone, and they have transferred that gene to ordinary bacteria cells. Using a technique known as fermentation, the genetically-altered bacteria can be mass-produced and the synthetic growth hormone can then be isolated and purified for large-scale, commercial production. (For general background information on BGH, see *RAFI Communique*, October-November 1986.)

The transnational corporations developing BGH products include: American Cyanamid, Elanco (a division of Eli Lilly) in conjunction with Dow Chemical, Monsanto and Upjohn. For further information, see "Corporate Profiles." Monsanto and Elanco are conducting the greatest number of field trials and are promoting the sale of BGH in the Third World.

A Product in Search of a Market

In 1986, RAFI interviewed representatives from Monsanto and Elanco about their plans for marketing bovine growth hormone in the Third World. Company officials insisted that BGH was not an appropriate product for Third World dairy producers because of the high degree of management required to use it efficiently. Four years later, the situation has changed dramatically. Corporate manufacturers of BGH have spent over \$100 million on research, development and promotion of their product, with little success to date. The Animal Sciences Division of Monsanto lost \$42 million in 1989 due to the high cost of promoting and defending its growth hormone products.¹

Unable to gain regulatory approval for commercial sale of BGH in North America and Europe, Monsanto and Elanco have recently launched aggressive campaigns to promote the testing and commercial sale of BGH in the Third World.

Offshore Field Trials & Commercial Sale

In 1989, the Soviet Union, Czechoslovakia, and South Africa became the first countries to approve the commercial sale of BGH. Mexico and Brazil were added to the list in 1990.

RAFI's survey of countries where BGH is now being tested or where field trials are about to begin, is compiled from published sources and interviews with company officials. The list includes: Argentina, Australia, New Zealand, Japan, India, Pakistan, Zimbabwe, Zambia, Tunisia, Malaysia, China and Egypt.

Details about Third World field trials and licensing of BGH are sparse. In Mexico and Brazil, for example, licensing of BGH is approved in limited geographic areas for a one-year period. Monsanto's BGH product, "Lactotropina," was approved by the Mexican Ministry of Agriculture in May, 1990. It will be marketed in the state of Torreón, north of Mexico City, and in the Bajío region south of the capital. According to Monsanto, the commercial price of the product has not yet been determined. Elanco received Mexican government approval for its BGH product ("Somidobove") in July, 1990.

In Brazil, Monsanto's BGH product was approved by the Division of Veterinary Products of the Brazilian Ministry of Agriculture, for commercial sale in the state of Sao Paulo, beginning in late 1990.

In India and Zimbabwe, BGH is being tested on indigenous livestock breeds. In India, Elanco is conducting tests on Murrah buffalo at the National Dairy Research Institute in Karnal, Haryana. In Zimbabwe, field trials of Monsanto's BGH on *indicus* cattle, conducted at the Henderson Research Station in Mazowe, report an increase of almost five-fold in milk production.²

Promoted in the Name of the Poor

The agrichemical/pharmaceutical corporations marketing and testing BGH in the Third World defend their product by claiming that it will help feed people in milk deficit countries. Consistently, Monsanto and Elanco dismiss concerns about BGH by claiming that the need to address problems of world hunger far outweigh any lesser concerns about the product.³ Elanco's vice-president for worldwide animal health products, Dr. Brendan Fox, claims that his company has "encountered no opposition to BGH in India or anywhere else in the Third World."⁴

Alternative Views

The marketing and testing of BGH in the developing world is not about feeding hungry people. In the words of Robert Orscoff of the United Nations Food and Agriculture Organization, attempts to market BGH in the Third World constitute "a criminal act for short-term gain."⁵ (Orscoff was quoted last year in *South* magazine). In the following section, RAFI briefly outlines major concerns and unresolved questions concerning the testing and sale of BGH in the Third World.

Adverse Economic Impacts

There is no question that biosynthetic BGH has the capacity to increase milk production. Under ideal conditions, cows receiving injections or implants of bio-synthetic BGH produce an average of 10-25% more milk, with a 5 to 15% increase in feed efficiency. But bio-synthetic BGH is not a magic bullet. Dairy animals treated with BGH require additional feed to sustain increased milk production. In many areas of the Third World this will mean diverting scarce agricultural land and resources away from land used to produce food or cash crops. Conversion of land to pasture, and the use of grain to feed dairy animals, rather than people, is often an inappropriate use of resources.

A recent paper on the outlook for dairying in developing countries prepared by W. Krostitz of the Food and Agriculture Organization makes important observations regarding future milk consumption in the Third World and its role in feeding hungry people. Dr. Krostitz concludes:

...although milk production is a relatively efficient way of converting vegetable material into animal food and dairy cows,...the loss of nutrients involved in production and the large amounts, often imported, of energy and equipment required in milk handling inevitably make milk a comparatively expensive food...In a situation of increased international prices, low availabilities of food aid and foreign exchange constraints, large-scale subsidization of milk consumption will be difficult in the majority of developing countries. Hence, in the foreseeable future, milk and milk products in the majority of developing countries will not play the same role in nutrition as the affluent societies of developed countries. Effective demand will come mainly from middle and high income consumers in urban areas.⁶ (Emphasis added.)

Ultimately, adoption of BGH in the South will require a significant capital investment and re-allocation of scarce resources. BGH is only one part of a sophisticated, capital-intensive package which requires substantial long-term investment. According to studies conducted at Cornell University:

...the introduction of bovine somatotropin will likely be accompanied by computer programs that optimize feed nutrient levels at the least economic cost. Computerized feeding stations, which tailor the feed mixture and amount of feed provided to an animal's unique performance characteristics will also be necessary, as will automated environments that reduce the stress to the animal from abnormal weather conditions.⁷

Industry literature on the use of BGH recommends a "quality environment" for dairy animals treated with the product. "Dairymen should provide adequate ventilation, minimum heat stress, dry bedding, clean alleys, adequate lighting, fresh feed, clean water and minimum stress handling."⁸ These are conditions not easily met by small dairy producers in many areas of the Third World.

Researchers in Zimbabwe point out that adoption of BGH by dairy producers implies an even greater commitment of capital to build a supporting infrastructure. Increasing the supply of milk will do little good if milk processing and manufacturing facilities are not available to insure that it is distributed to rural communities.⁹

Potential Adverse Effects on Animal Health

Despite industry claims to the contrary, there is a growing body of evidence that BGH causes adverse effects on the dairy herds being treated. It is important to point out that it is difficult to find independent studies on this topic, since all research on BGH at over 20 universities in the United States is financed by companies that are developing a BGH product.

Dr. Samuel Epstein of the University of Chicago's School of Public Health notes that there are "critical data gaps" on the veterinary effects because there is "no information available from large-scale multilactational and multigenerational dose-response tests with synthetic hormones on a wide range of veterinary and related concerns."¹⁰

Animal health problems associated with the use of biosynthetic BGH include: Increased incidence of infectious disease; reduced fertility; heat intolerance; and changes in nutritional quality of milk. (This *Communique* does not attempt to provide a detailed discussion and documentation of these issues; please see last page for a list of further sources containing more complete information on this topic.)

On July 26, 1990 the Veterinary Products Committee of the United Kingdom recommended that Monsanto's request for licensing of BGH be rejected by the U.K. govern-

ment. The committee concluded that the product did not pose a threat to humans, but questioned the safety of Monsanto's product in treated animals.

Potential Adverse Effects on Human Health

There is very little documented information on the potential adverse effects of human consumption of milk and/or meat from BGH-treated cows, but the subject is highly controversial.

In the United States, milk from cows being tested with BGH is sold commercially, despite the fact that BGH has not yet been approved by the U.S. Food and Drug Administration for commercial sale in the United States. In the Netherlands, BGH use with research cows must end 28 days before milk or meat from the cows can be sold for human consumption.¹¹

Manufacturers of BGH claim that BST is not orally active, and if consumed is simply digested like any other protein. In August, 1990, two highly-respected scientific journals endorsed the safety of bovine growth hormone for humans. It should be noted, however, that the authors of one of the articles, appearing in the Journal of the American Medical Association, were formerly consultants for Monsanto Co.

Critics of BGH take issue with the assumption that biosynthetic BGH is no different from the naturally-occurring BGH produced in the animal's pituitary gland, and they question whether or not BGH is biologically inactive. See Appendix for a list of sources that will provide additional information and a more detailed discussion of these issues.

Conclusion

Transnational corporations are aggressively promoting BGH in the name of the poor--but poor people will be the last to benefit. Increasing production of milk in the Third World has little to do with feeding hungry people. When poverty is the problem, new technology is rarely the solution. The marketing of BGH in the Third World will simply create greater dependency on imported, costly and inappropriate technologies.

Given the unresolved questions surrounding the commercialization of BGH in the industrialized world, it is especially ironic that Third World countries are serving as the testing ground and preliminary market for this controversial product. Third World consumers and producers must therefore be fully informed of the potential social, economic and health effects of this product.

Sources of Additional Information

* *"Bovine Growth Hormone Report"* by Michael K. Hansen, Consumer Policy Institute, 256 Washington St., Mt. Vernon, NY 10553, USA. Price: (US) \$4.00--limited number are available free to Third World activist NGOs. This report will be available in early November, 1990.

* A reprint of Dr. Epstein's article, *"Potential Public Health Hazards of Biosynthetic Milk Hormones"* is available by request. Write: Dr. Samuel S. Epstein, Health Resources Management (M/C 922) School of Public Health West, University of Illinois at Chicago, Box 6998, Chicago, IL, 60680, USA.

* *The Ram's Horn*, "A Consideration of Bovine Growth Hormone," by Brewster Knéen, 125 Highfield Road, Toronto, Ontario M4L 2V4, Canada. (Include (US) \$2 for postage and handling.)

FOOTNOTES

1. Monsanto Co., Annual Report, 1989, p. 26.
2. Animal Pharm, No. 208, July 20, 1990, p. 22.
3. See, for example, statement by Lee Miller, V.P. of Animal Science, Monsanto Co., "Values Collide," in Bio/Technology magazine, May, 1990 and "Buffalo in India Targeted for BGH," in Agri-View Dairy, June 14, 1990.
4. Quoted in article by Fyksen, Jane, "Buffalo in India Targeted for BGH," Agri-View Dairy, June 14, 1990.
5. Green, Jeremy, "Hormone Producers Bid to Milk the Market" in South, July, 1989, p. 63.
6. Krostitz, K., Commodities and Trade Division, FAO, Rome. Draft paper to be presented at the International Dairy Federation Annual Sessions in Toronto, Canada, October, 1990. (C-Doc139, 1990.)
7. Kalter, Robert J., "The New Biotech Agriculture: Unforeseen Economic Consequences" in Issues in Science and Technology, Fall, 1985, p. 130.
8. Animal Health Institute, "Bovine Somatotropin," 1985, p. 9. The Animal Health Institute is a trade association of U.S. manufacturers of pharmaceuticals and livestock products, based in Alexandria, Virginia (USA).
9. Anonymous, "Trials on Monsanto's BST in Zimbabwe," in Animal Pharm, no. 208, July 20, 1990, p. 22.

10. Epstein, Samuel S., "Potential Public Health Hazards of Biosynthetic Milk Hormones", International Journal of Health Services, vol. 20, no. 1, p.78.
11. Animal Health Institute, Press Release, "BST Internationally," April, 1990, p. 1.

CORPORATE PROFILES

Monsanto (St. Louis, Missouri, USA) 1989 sales (US) \$8.7 billion, ranks number 55 on Fortune 500--ranking of largest U.S. industrial corporations.

Eli Lilly (Indianapolis, Indiana, USA) 1989 sales \$4.2 billion. Ranks number 116 on Fortune 500. Elanco is the animal products division of Eli Lilly, with sales of \$337 million in 1989.

Upjohn (Kalamazoo, Michigan, USA) 1989 sales of \$2.9 billion. Ranks number 156 on the Fortune 500.

American Cyanamid (Wayne, New Jersey) 1989 sales of \$4.8 billion. Ranks number 106 on the Fortune 500.

Source: Fortune Magazine, 1989.