bST & MILK

Benefit or Bane?

by Anya M. McGuirk and Harry M. Kaiser

➢ **Bovine somatotropin (bST), a genetically engineered hormone for dairy cows that could increase milk yields by as much as 10 to 25 percent, is currently in the final phases of the U.S. Food and Drug Administration (FDA) approval process. Anticipating its ultimate approval economists and industry analysts have concentrated their studies on the potential impact of bST on individual farmers, as well as on the dairy industry as a whole—the supply effects. In contrast, demand aspects have been largely ignored. But they shouldn't be because consumer backlash to bST in terms of lower demand could be substantial.**

Anya M. McGuirk is an Assistant Professor of Agricultural Economics and Statistics at Virginia Polytechnic Institute and State University, and Harry M. Kaiser is an Assistant Professor of Agricultural Economics at Cornell University.

A perusal of the many articles on the potential impacts of bovine somatotropin (bST) leads one to think that many people, including agricultural economists, believe that the adage "supply creates its own demand" is an immutable law. Much time has been spent on the supply side effects of bST while assuming that the demand for bST produced milk will be no different from demand for milk produced without bST—for consumers they would be perfect substitutes. Perhaps this "no-demand effect" assumption has been perpetuated because, as far back as 1985, the FDA concluded that milk and meat from bST-treated cows would pose no threat to human health. As a result of this early ruling, milk from experimentally bST-treated cows has been allowed to enter the commercial food supply.

But will there really be no effect on demand? Arguing that there will be no consumer backlash is difficult. Consumers are increasingly aware of the link between diet and health and their confidence in the government's ability to ensure the safety of our food supply is eroding. Couple these trends with a highly publicized debate over the introduction of bST and a negative consumer reaction to the introduction of milk from cows treated with bST seems likely.

The current debate focuses on human and animal health concerns as well as economic issues. Questions on the use of biotechnology in food production, the safety of milk from bST-treated cows, and the effect of bST on animal health and well-being are central to the debates. Economic issues concern whether the introduction of bST will have a negative impact on the dairy industry, particularly small family dairy farms. Opponents worry that lower milk prices—spurred by bST-induced milk surpluses—will hurt family farmers. Responding to the family farm issue, Ben & Jerry's Ice Cream Company initiated an anti bST campaign last year by labeling all of their ice cream containers with a "Stop bST" symbol and their campaign slogan "Save The Family Farm."

Though the *extent* to which the general public is concerned about bst is not known, several of the nation's largest supermarket chains, including Krogers and Safeway, have agreed not to sell milk from bst-treated cows until the FDA gives its final approval. In addition, Wisconsin and Minnesota have passed laws banning the use of bST in their states until mid-1991. Although bST is not expected to be approved before the Wisconsin and Minnesota bans expire, the political climate, at least in these states, has guarantees there will be further debate.

If the introduction of bST is mishandled, the destruction of public confidence in biotechnology may be irreversible. And many things can still go wrong. First, consumers may not yet be ready to knowingly accept biotechnologies that affect their food supply. Second, if available studies and predictions of bST's winners and losers are off the mark, incorrect decisions by farmers and policymakers may prove very damaging to them. These studies largely ignore the potential concerns of consumers. Finally, if the introduction of bST is not successful, companies may be reluctant to make future large investments in biotechnology research and development. Given all that is at risk, it is reasonable to proceed cautiously and determine the position of consumers on bST *before* it is approved. To what extent are consumers aware of the current bST controversy, and what are their perceptions?

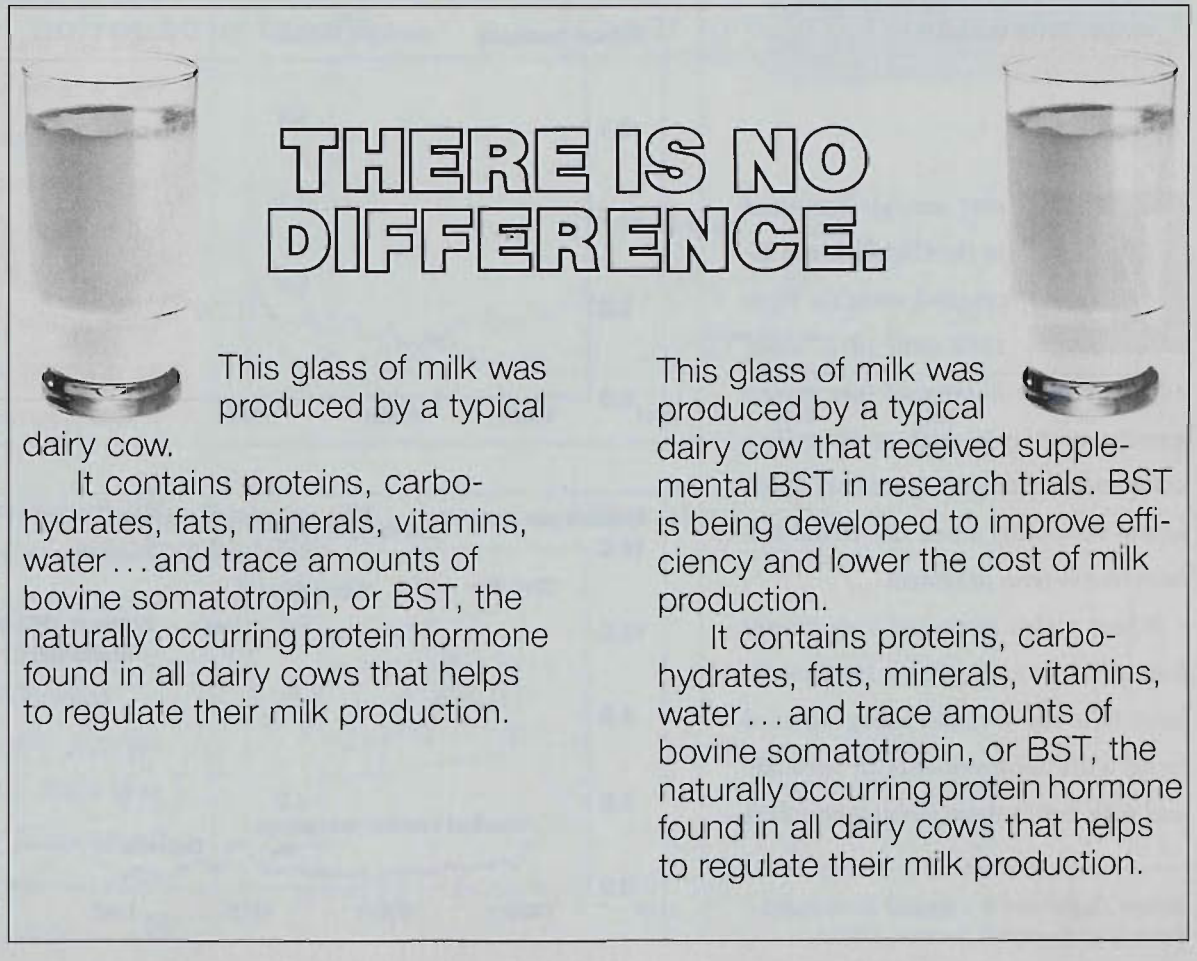
A Two State Consumer Survey

To help gauge consumer perceptions and reactions to bST, two separate surveys were recently conducted, one in Virginia and the other in New York. The surveys were mailed to a random sample of over 2000 households in each state. The two surveys provided to the respondents similar—though not identical—descriptions of the bST technology and the current state of knowledge about its safety (see boxes). Respondents were asked questions regarding their attitudes about the technology and about several issues central to the bST debate. Approximately one-third of the households responded: 716 in New York and 607 in Virginia.

Despite the random design of the survey, Caucasians with more

Continued on Page 24

Example of information circulated by the BST Public Information Group of the Animal Health Institute, a group that favors bST.



 Continued from Page 21

TABLE 1
bST AND THE ISSUES

Statements	*New York*	*Virginia*
	(Percent of Population)	
Previously heard about bST	27.5	16.6
bST milk is safe:		
Agree/Tend to Agree	29.1	35.6
Disagree/Tend to Disagree	31.5	20.7
Don't Know	39.4	43.7
bST milk should be labeled:		
Agree/Tend to Agree	85.1	85.8
Disagree/Tend to Disagree	6.7	6.2
Don't Know	8.3	8.0
Administering bST to cows is humane/okay:		
Agree/Tend to Agree	23.7	39.7
Disagree/Tend to Disagree	40.3	37.9
Don't Know	36.0	22.4
bST will be beneficial if price of milk decreases:		
Agree/Tend to Agree	26.2	42.4
Disagree/Tend to Disagree	45.5	37.3
Don't Know	28.3	20.3
bST should be approved:		
Agree/Tend to Agree	30.2	44.1
Disagree/Tend to Disagree	35.9	21.9
Don't Know	33.9	33.7

Source: New York and Virginia survey results adjusted to account for sample bias.

formal education and higher household income were over-represented in the sample in each state. The results reported here have been adjusted using standard statistical techniques to account for the differences in household income between the sample and the population.

Consumer Perceptions of bST

Despite the well-publicized controversy regarding bST nationwide, less than one-fifth of all Virginia households and just over one-quarter of all New York households had heard or read about bST prior to receiving the survey. As a result, the majority of respondents relied solely on the information presented with the survey. Although the exact statements in the two surveys differed slightly, the underlying issues presented were comparable (see boxes).

Are consumers concerned about the safety of milk from cows treated with bST? The survey results suggest they are. More than one-fifth of the households in Virginia and about one-third of those in New York expressed doubts about the safety of "bST milk". Although these households represent no majority in either state, they represent a healthy proportion of their respective populations to affect seriously the demand for milk and other dairy products. Clearly, in the minds of these consumers, the human safety issue is not resolved.

Although the majority of the scientific community appears convinced that bST poses no threat to human health, some scientists still remain concerned. In an unprecedented move to convince scientists and the general public of bST's safety, the FDA recently published an article in *Science* on the safety of bST. It emphasized that bST does not pose a threat to human safety. In addition, the FDA also asked the National Institutes of Health (NIH) to make a fresh appraisal of the possible dangers to humans who drink milk or eat meat from animals treated with bST. The NIH panel gave a clean bill of health to the use of bST in the production of milk. However, the panel recommended further research on the human health issues surrounding the finding of slightly higher amounts of another hormone, insulin growth factor, in milk from bst-treated cows. In spite of the NIH panel findings, the Consumer Union, publisher of *Consumer Reports* "remain unconvinced" and are calling for the FDA to reopen its evaluation of the hormone's potential effects on consumers. Although it is naive to believe that a total consensus will ever be reached, hopefully these actions by the FDA and the subsequent debates and further reviews will result in a near consensus one way or another. If the near consensus is that bST poses no health threat, a nationwide consumer education campaign may be in order. While it is important to provide consumers with the scientific evidence, consumers should not be expected to reach to the same conclusions as scientists. It is well known that consumers consider factors neglected by scientists in forming their opinions about the safety of different products.

New York Survey Description of bST

About bST...

Dairy cows naturally produce a protein hormone called bovine somatotropin or bST (sometimes called bovine growth hormone). Recently, it has become technically feasible to manufacture bST outside of the dairy cow. When man-made bST is injected into cows, milk production will increase an average of 10 to 15 percent.

Based on an extensive review of information related to the safety of bST, the Food and Drug Administration (FDA) concluded that milk and meat from bST-supplemented cows are safe for human consumption. The FDA may approve the commercial use of bST by dairy farmers in 1991.

Those in favor of giving man-made bST to cows say that this practice is safe and will benefit consumers by lowering prices they have to pay for dairy products. They also say that research studies have shown that giving man-made bST to dairy cows does not hurt the cows and that the milk and meat are safe.

Those against giving cows man-made bST say that increased milk production will create milk surpluses. This may hurt farmers by decreasing milk prices and farm income. They also think that injecting bST into cows is cruel and question whether meat and milk from these cows are safe.

Although just over 35 percent of Virginia households and 30 percent of New York households are convinced that milk from cows supplemented with bST is safe, 85 percent of the households in both states agree that "bST" milk should be labeled. Thus, most of those consumers who are convinced of the safety of bST would still prefer to make their own decision about whether to buy it. However, because available technology cannot distinguish between milk from treated cows versus non-treated cows, labeling could be difficult if not impossible to enforce.

Human safety, however, is not the only issue; animal welfare is also a concern for a substantial segment of the population. Just over 40 percent of New York households do not think administering bST to cows is "okay". More than one-third of all Virginia households consider the practice cruel. Again, although not a majority in either state, these proportions are large enough to suggest that the use of bST could ultimately be effectively challenged by the animal rights movement.

If bST does lower the price of milk, will consumers consider bST beneficial? The answer is "no" for almost half the population of New York. Although not quite as strong, (just one 37 percent), a sizeable portion of Virginians also do not believe bST is necessarily beneficial if it lowers the price of milk.

In both states, more than one-fifth of the households were unable to form an opinion regarding the human and animal safety issues as well as the price issue. This indecision also was carried through in their overall opinion on whether bST should be approved. Approximately one third of both the New York and Virginia households were unable to decide whether bST should be approved. These numbers are not surprising given that over 75 percent of those responding had not heard about bST prior to receiving the survey. The large undecided segment of the population suggests there is plenty of room for persuasive advertising by special interest groups who wish to sway consumers one way or another.

Continued on Page 26

TABLE 2
THE INTRODUCTION OF bST & WEEKLY FLUID MILK PURCHASES

Scenario	*New York*	*Virginia*
bST introduced, price/gallon same:	*(Percent of Population)*	
Purchases increase	0.5	1.5
No change in purchase	76.1	82.7
Purchases decrease	15.0	5.4
Stop buying milk	8.4	9.5
	(Percent Change)	
Impact on current weekly milk purchase	-19.8	-17.8
bST introduced, 40 cents decrease in price/gallon:	*(Percent of Population)*	
Purchase increase	4.5	11.5
No change in purchases	76.0	71.0
Purchases decrease	11.1	6.5
Stop buying milk	8.4	10.4
	(Percent Change)	
Impact on current weekly purchases:	-19.4	-9.2

Source: New York and Virginia survey results adjusted to account for sample bias

Virginia Survey Description of bST

More Milk Through Biotechnology?*

Bovine somatotropin (BST) is a hormone that is produced naturally in dairy cows. Advances in biotechnology have made it possible to produce bST in the laboratory. University research over the past seven years shows that dairy cows injected with BST produce 10 to 25 percent more milk. BST should lower the cost of producing milk to the farmer. It should improve incomes on dairy farms. As a result, the price of milk could decrease as much as 10 cents a gallon. BST cannot be added to the cow's feed. It must be given by injection. The frequency of these injections may range from once a day to once every 14 to 28 days.

There is opposition to the use of BST. Some individuals believe that BST will create large milk surpluses. This could depress the price of milk and drive some farmers out of business. Some people oppose BST because they believe that genetic engineering is either dangerous or should or should not be used in food production. Other people oppose BST because they feel that BST injections to cows are cruel. Also, there is concern by some people that too little research has been conducted to assure the safety of milk and dairy products from cows treated with BST.

University researchers believe that BST treatments of cows, given in reasonable does, do not affect the quality or safety of milk and are not a public health threat. The amount of BST in milk from treated cows has not been shown to differ from that found naturally in milk. There is no available method to test if milk is from BST-treated cows. In the future, more sensitive methods may show differences in the level of BST in milk from treated and untreated cows. BST is not a steroid hormone. Available research shows that BST appears to have no direct influence on milk composition.

BST is still under development. The Food and Drug Administration (FDA) may approve BST for commercial use in dairy cattle next year.

**A subtly different (more "pro-bST") version of the above text was presented to half of the sample. Responses did not differ significantly by version.*

Example of information circulated by the Foundation on Economic Trends, an organization that opposes bST.

bST and the Demand for Fluid Milk

Whatever the basis for consumers' perceptions of and fears about bST, the consequences may be quite substantial. Certainly, consumers' perceptions play an important role in their consumption decisions. This fact was made vividly clear by the Alar incident in the apple industry last year. One estimate of the loss in sales incurred by the apply industry as a result of the scare is 100 million dollars for 1989 alone.

To what extent will consumer concern with bST be reflected in the demand for dairy products? To estimate potential market reaction, the surveyed households were asked about their current weekly purchases of fluid milk and how these purchases would be affected following the adoption of bST by dairy farmers, if the price of milk remained unchanged and if the price decreased by 40 cents (Table 2).

Compared to Virginia, a greater percentage of New York households claim they would purchase less fluid milk following the introduction of bST under both price scenarios. This outcome is not surprising since New York consumers expressed more skeptical views of bST than Virginia consumers. Despite this difference, consumers in both states indicate they will decrease their purchases of fluid milk by 18-20 percent if the price of milk is unchanged.

What if the production response in bST treated cows is substantial enough to lower the price of milk? Several households indicated that their milk purchases will go up. However, even in Virginia, where over 10 percent of the households claim that their milk purchases will increase, the decline in current weekly milk purchases would still be greater than 9 percent. In New York, the decline in price would have virtually no impact on purchases and decreases in weekly purchases of fluid milk would decline by more than 19 percent.

Clearly, these sizeable decreases in fluid milk purchases following the introduction of bST would have a major impact on the dairy industry and the profitability of bST. Although consumer intentions may not be carried out fully or may fade over time, it is obvious that a 'no-demand effect' assumption is clearly inappropriate. As a consequence, many impact studies that do not incorporate effects on demand into the projections may be unreliable.

The relatively large consumer backlash indicated by the Virginia and New York survey suggests that bST adoption will lead to a bigger gap between supply and demand—hence, lower farm prices or larger government stocks than previous studies have indicated. Should industry decide to introduce bST, they will need to be proactive rather than reactive in planning strategies to allay the fears of consumers over bST. However, the public should be accurately and fully informed about the issues and the current (scientific/professional) consensus on each of the issues so that they can make informed decisions about the new technology. Any misinformation foisted on the public by special interest groups will only make the public more skeptical—and create more roadblocks for technology in the future.

For More Information

Detailed Virginia results are reported in "Biotechnology and the Consumer: The Case of Bovine Somatotropin" by Anya M. McGuirk, Warren P. Preston, and Gerald M. Jones, Virginia Tech, Department of Agricultural Economics Staff Paper 90-60 and in "Consumer Reaction to the Introduction of Bovine Somatotropin" by Warren P. Preston, Anya M. McGuirk, and Gerald M. Jones, forthcoming in *Economics of Food Safety*, Iowa State University Press. Copies of these papers may be obtained by writing the Department of Agricultural Economics, Hutcheson Hall, Virginia Tech, Blacksburg, VA 24061-0401.

The New York results are from the first version of the Cornell University Food Safety and Consumer Concerns survey. Analysis of the survey data is still in progress. More information regarding the survey may be obtained by writing Harry Kaiser, Department of Agricultural Economics, Warren Hall, Cornell University, Ithaca, NY 14853.

Do you have a copy of...

1990 Farm Bill Environmental and Consumer Provisions, a two volume reference prepared by the Center for Resource Economics? Volume I contains 200 pages of Statutory Language and excerpts of statutory language from the Food, Agricultrue, Conservation and Trade Act of 1990 that the Center considers relevant to environmental and consumer issues. Volume II is a 120 page summary of the provisions of the legislation cited in Volume I with excerpts of all significant statements made jointly by House-Senate "Managers" in the Conference Report.

The two volumes may be ordered from the Center for Resource Economics/Island Press for $24.95 + tax (if Applicable) + $3.00 postage and handling. Discounts on bulk orders are available. Call toll free 1-800-828-1302.