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Impact of Animal Growth Promotants on the Dairy Industry

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Bauman's early experiments at Cornell indicated increased milk production due to the administration of bovine somatotropin (BST) during the last two thirds of the lactation period. Milk production normally falls consistently after peaking at approximately 90 days after calving. However, the persistency of production in animals given BST was substantial. With a 40 mg. dose, a 41 percent increase in production took place during the time of administration. This translates into a 26 percent increase on a full lactation basis. Lower dosages, particularly 27 mg. per day, also achieved good results; 36 percent during administration or 23 percent on average for the lactation. From these numbers, it appears that when the product comes on the market, it will be at a somewhat lower dosage rate than Bauman's optimal results. Food and Drug Administration (FDA) labels will most likely appear for dosages lower than 40 mg.

BST DOSAGE RATES

Once FDA approval is given, it is likely that there will be a number of labels for different companies, each with different dosage rates and delivery methods. The farm operator will be able to choose amongst the various labels and different methods of administration. Administration choices will include daily injections and sustained release injections. The sustained release injection will release a product over a longer period of time; two, three, or four weeks, so that only one injection has to be given for that period. A farm operator will need to select the dosage level and timing of injections from the available array.

What are the implications of BST use? The milk yield increases can reach 25 percent. In some experimental herds, yield increases in the field have actually been a little higher. However, production increases can also be zero. Feed efficiency improvements can range as high as 8 to 11 percent depending upon the production level and the response rate of the cow.

ECONOMIC IMPLICATIONS

Based on feed efficiency improvements, there will be production cost reductions ranging from five to nine percent. When BST is used, cows must be fed additional forage and concentrate in order to produce additional milk. This increased intake is proportional to the milk that a cow produces, so the savings, as far as feed efficiency is concerned, are strictly due to spreading the cost of the maintenance portion of the ration over more milk production.

Thus, the potential economic implication of protein synthesis regulation is to reduce the total nutrient requirements for the national dairy herd, not for the individual animal. Reductions in the national herd size from 11 million animals down to eight or nine million will occur. A decrease in total livestock feed requirements will mean a decrease in land requirements for feed grains and forage, and changes in both feed and land prices.

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Possible alterations in regional production patterns may also occur. As poorer quality lands are no longer needed, they will go out of dairy production, and production could move onto better land in the Corn Belt and elsewhere. Consumer prices should become somewhat lower and there will be an increased demand for some of the products from the industry. Herds are going to have to be better managed to be productive with BST, and the improved management will improve product quality.

STRUCTURAL IMPLICATIONS

What are the structural implications for the average farm? As noted, management intensity will need to be substantially increased. Higher literacy skills, computer skills, and analytical skills will be required to run the dairy farm of the future. Good management skills will be absolutely critical for the successful adoption and use of BST.

Synergism will exist between different technologies. If herds are to be managed properly, computers will have to be utilized, particularly

for large herds. Using the computer to collect and analyze data and to actually perform day-to-day operations previously handled by labor, will mean increased consistency in carrying out the management function with a savings in time and money. Other technologies can be used to further improve herd management. For example, robotics and controlled environmental housing will be adopted during the last half of the 1990s.

Although BST is generally considered "scale neutral" (that is, it can be used by small or large farms without bias in terms of profitability), but when management capability is taken into account, BST is no longer scale neutral. In this case, larger farms have an advantage, so the economies of scale are going to play an important role. Also, economics of scale are important when other technologies are used in conjunction with BST. Most of the synergistic technologies are capital intensive. This will add additional capital intensity to the sector, and there will be financial impacts that go beyond the purchase price of BST itself.

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PRODUCTIVITY AND PROFITABILITY

The productivity and profitability of top producers in the dairy industry is growing more rapidly than that of average producers. This is a difficult hypothesis to test, because of data limitations, but there is some evidence from the New York dairy farm business summaries. If it is true, it places increasing economic pressure on those operators that are below average or are above average, but not in the top ten percent. Some of the below average operators are only going to survive if they have no debt.

Biotechnology is going to impact the best managed farms the most, because the early innovators are going to benefit before prices in the market begin to drop. The spread between the top decile farms and the rest of the group is widening, and biotechnology and BST in particular, will probably increase that gap over time.

DAIRY FARMS SURVIVAL

Which farm operators are going to survive as resource commitments in the dairy sector are reduced? The successful innovators are going to be the survivors. Early innovators and people with production and business management skills are going to have an advantage. If farmers have a quality resource base that enables them to grow good forages, they will have an advantage. If farmers have sufficient scale economies to actually manage their operations rather than do the work themselves,

and they have sufficient capital available to add other technologies to support BST, they have a better chance to survive. If the financial health of a dairy business is good and they are specialized, they have a better chance of surviving.

Failure to adopt BST could possibly lead to the demise of the farm. There will certainly be a loss of market share for the industry, which very few of the critics of BST recognize. The dairy industry is always in a market share battle with other food products, and if the industry fails to keep its cost structure reasonable in relation to competing food products, they are going to lose market share to other portions of the food sector.

In the short term, the use of BST will put some dairy farmers out of business, but if BST is not adopted, more farmers will be lost in the long run. The failure to adopt new technology in general means a lower standard of living for society because, in the end, consumers benefit by the adoption of new technology.

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PUBLIC POLICY

Public Policy is very unresponsive to uncertainty, and dairy farming is entering a stage of substantial uncertainty. Adjustment to the dairy industry may be inhibited by imposing additional public policy constraints. Policy has to be designed to foster the removal of excess capacity in the industry. The industry is already 20 percent or more in excess in terms of the number of dairy farmers needed to have a free market in milk without BST. Obviously, adding the additional production capability due to the use of BST, is going to make this situation worse. A socially acceptable policy to remove excess capacity must be implemented. The removal of price supports and the income support program of public policy is going to be important. Public income should emphasize education, human services, and social safety nets. This would make for an improved and healthier dairy sector in the long run.