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ECONOMICS OF USING rbST

J. F. Smith

Summary

As new technologies such as rbST become available to dairy producers, evaluating the profitability of those technologies on individual farms is essential. Costs associated with rbST include purchase of product, feed, and labor. The costs of product and labor are independent of milk response. However, feed cost will increase as the milk production response to rbST increases. If the mailbox milk price is \$10, approximately 7 lb more milk per day will be required to break even. It is essential that dairy producers have the management in place to achieve a profitable milk response to rbST.

(Key Words: Recombinant Bovine, Somatotropin, Economics.)

Introduction

Recombinant bovine somatotropin (rbST) first became available to U.S. dairy producers in February, 1994, after approval by the Food and Drug Administration. The product approved, Posilac®, is manufactured and marketed by the Monsanto Company. As new technologies such as Posilac® become available, it is essential that dairy producers understand how to use them profitably. A number of factors affect the profitability of cows supplemented with rbST. Some of these costs include: feed, labor, price of the product, milk price, and achieved milk production response. The objective of this report is to consider the financial implications of rbST on a per cow basis.

Feed Costs

Dry matter intake of dairy cows treated with rbST will increase 2 to 7 wk after the initiation of treatment. Rations should be balanced to meet the requirements for body condition and milk production.

The amount of energy required to produce an additional pound of milk is .31 Mcal. This

assumes that the maintenance requirements of the cow have been satisfied. If a ration contains .78 Mcal per lb of dry matter, a dairy cow would have to consume an additional .4 lb of dry matter per lb of milk response, or 4 lb of dry matter per 10 lb of milk.

Table 1 lists the feed costs required to produce an additional pound of milk at different costs per lb of dry matter (5¢ to 12¢).

Table 1. Feed Cost Associated with Cows Treated with rbST as Related to the Cost of Dry Matter per Pound

Cost per pound of dry matter	Feed cost per pound of milk response to rbST ¹
--cents--	--cents--
5	2.0
6	2.4
7	2.8
8	3.2
9	3.6
10	4.0
11	4.4
12	4.8

¹ Calculations are based on .31 Mcal per pound of milk above maintenance and a ration providing .78 Mcal per pound.

In Table 2, the daily feed costs associated with treating cows with rbST at different milk response levels (4 to 15 lb) have been calculated. Using a combination of the information in Tables 1 and 2, a producer can determine the

additional feed cost associated with treating cows with rbST at different levels of milk production achieved.

Labor

Dairy producers will need to reallocate existing labor and/or hire more labor in order to implement effectively an rbST program. Additional labor should be used to keep injection records, inject cows, and score cows for body condition. The rbST program can be as simple or complex as desired. The labor cost of an rbST program likely will vary significantly from farm to farm. For example, some dairy producers keep injection records and body condition scores for individual cows. Other producers assign cows to pens in which all cows are treated with rbST every 14 days. An additional labor cost was assumed to be \$.02 per treated cow.

Price of rbST

In this paper, it was assumed that the cost of a 14-day dose of Posilac® is \$5.80. Therefore, the daily cost of Posilac is \$.41.

Achieved Milk Response and Milk Price

Milk response to rbST and the market price of milk have dramatic effects on the profitability of using rbST. The profitability of using rbST is evaluated on a per cow basis in Table 3. Nine milk response levels (7 to 15 lb) and three mailbox milk prices were used. The costs of Posilac® and labor remained constant in the analysis. However, feed cost increased with the level of milk response.

The mailbox milk price will have a significant effect on profitability at a given level of milk response to rbST. For example, a \$10 milk price with a 10-lb milk response generates a profit of 29¢ per treated cow. That compares to a 49¢ profit per treated cow at a \$12 milk price at the same milk response level.

On the other hand, the level of milk response to rbST is also extremely important in effectively using this new technology. If we assume a constant milk price of \$10 per cwt, an 8-lb response to rbST will generate a profit of 14¢ per treated cow compared to 43¢ per treated cow with a 12-lb response.

Table 2. Daily Feed Cost Associated with Treatment with rbST at Different Daily Milk Responses

Milk response --lb/day--	Feed cost per pound of response			
	2.0¢	2.5¢	3.0¢	3.5¢
	-----cents per cow per day-----			
4	8.0	10.0	12.0	14.0
5	10.0	12.5	15.0	17.5
6	12.0	15.0	18.0	21.0
7	14.0	17.5	21.0	24.5
8	16.0	20.0	24.0	28.0
9	18.0	22.5	27.0	31.5
10	20.0	25.0	30.0	35.0
11	22.0	27.5	33.0	38.5
12	24.0	30.0	36.0	42.0
13	26.0	32.5	39.0	45.5
14	28.0	35.0	42.0	49.0
15	30.0	37.5	45.0	52.5

Table 3. Predicted Profitability of Using rbST Based on Variable Milk Price and Milk Response¹

Milk response	Expenses				Mailbox milk price					
	rbST	Feed	Labor	Total cost	\$10 per cwt		\$11 per cwt		\$12 per cwt	
					Gross income	Net income	Gross income	Net income	Gross income	Net income
--lb/day--	----- cents per day -----									
7	.41	.20	.02	.63	.70	.07	.77	.14	.84	.21
8	.41	.22	.02	.66	.80	.14	.88	.22	.96	.30
9	.41	.25	.02	.69	.90	.21	.99	.30	1.08	.39
10	.41	.28	.02	.71	1.00	.29	1.10	.39	1.20	.49
11	.41	.31	.02	.74	1.10	.36	1.21	.47	1.32	.58
12	.41	.34	.02	.77	1.20	.43	1.32	.55	1.44	.67
13	.41	.36	.02	.80	1.30	.50	1.43	.63	1.56	.76
14	.41	.39	.02	.83	1.40	.57	1.54	.71	1.68	.85
15	.41	.42	.02	.85	1.50	.65	1.65	.80	1.80	.95

¹ Assumptions: Cost of rbST (\$5.80) per 14-day dose, feed cost of 7¢ per lb of dry matter, labor cost of 2¢ per treated cow per day.