

Update on rbST Use in the California Dairy Industry

Henry An and Leslie J. Butler

The share of California dairy producers who use rbST reached its peak in 2001 and has slowly declined since then. Many producers have disadopted rbST and survey results suggest that rbST use in California will continue to decrease in the near future.



RbST has been in use for nearly 15 years, but many producers believe the future of dairy production in California will not include rbST.

Just over ten years ago, we reported on the use of recombinant bovine somatotropin (rbST), a genetically engineered growth hormone used to increase milk production in cows, in the California dairy industry (see *ARE Update*, Vol. 1, No. 2, Winter, 1998). Our conclusions at that time were as follows:

About 25% of California dairy producers were using, or had used, rbST, and another 20% had expressed interest in using it in the future.

California producers were using rbST on an average of about 25% of their herds, from which it was inferred that about 10% of the total California herd was being treated with rbST. Since average reported response rates were about 11%, we concluded that rbST's impact was less than a 1% increase in milk production.

We also concluded that there was some uncertainty about rbST use among its current and prospective users. While concerns about public opinion, and the effect on milk sales, had diminished dramatically since its commercial introduction in 1994, current and prospective users still had concerns about the effect of rbST on the health of their herds, adverse prices as a result of increased milk production, and the cost effectiveness and efficacy of the new technology.

Much has changed in the California dairy industry in the last ten years. In this brief update, we report some preliminary findings and take stock of what has happened since those surveys were conducted in 1994 and 1996.

RbST Use in California through the Years

Many economic studies attempted to predict potential rbST adoption rates

in the late 1980s and early 1990s, prior to rbST's commercial release in 1994. These ex-ante studies predicted national aggregate adoption rates of between 33% and 92%. In California, we conducted several ex-ante surveys and found that the percentage of respondents who claimed to be prospective users declined from 42% to 30% between 1987 and 1993, while the percentage of producers who said that they would never use rbST increased from 29% in 1987 to 62% in 1993. This latter group of producers had concerns that rbST would have negative health effects on their cows; that milk from rbST-treated cows would not be safe for human consumption; and that the use of rbST would not be profitable and—through overproduction—would sharply reduce the price of milk in the United States, leading to severe industry disruption.

A survey conducted about six months after the commercial release of rbST in 1994 showed that about 18% of producers were using rbST, and about another 5% had had previous experience through field trials run by the companies who were producing the new biotechnology. Another 18% said they would consider using rbST in the future while 59% declared themselves committed non-users. At this stage, it looked as if the maximum adoption rates for rbST would be around 40% of producers. Table 1 (see page 6) presents summary statistics of the adoption and use of rbST in 1994, 1997/98, and 2002.

Between 1994, when the survey was administered about six to nine months after the commercial release of rbST, and 1997/98, adoption rates climbed from about 23% (current and past users) to almost 46%. However, it is clear that many producers had tried

Table 1. Adoption and Use of rbST (%) in 1994, 1997/98, and 2002

	1994	1997/98	2002
Current Users	18	28	27
Past Users	5	18	18
Prospective Future Users	18	17	9
Non-Users	59	38	46

Source: Butler, 2003

rbST and decided to discontinue its use. The 1997/98 survey yielded over 50 different reasons why producers who had previously used rbST then stopped using it. For many, rbST was simply not producing positive results. Many felt that it was not cost effective, and many also had problems like mastitis, lameness, loss of condition, and lowered immune system functions which they attributed to rbST use. At the same time, the number of committed non-users dropped from a high of 60% in 1994 to around 37% in 1997/98.

However, during the period 1998–2002 many producers apparently changed their mind about rbST. While the percentage of current and past users remained about the same, the number of producers who became committed non-users rose to around 46%, and only 9% said they might use it in the future.

Since its release in 1994, the share of dairy operations that use rbST in California reached a peak of just over 30% in 2001, making California one of the larger adopters of rbST in the United States (see Figure 1). However, in the past decade, the percentage of dairy producers using rbST has decreased substantially, suggesting that many producers may be in the process of disadopting rbST. There are several reasons that producers may have stopped using rbST. First, many producers still question the efficacy of the technology and are uncertain that it leads to higher profits. While there is little doubt that some cows treated with rbST do produce more milk, the wide variability of increased milk production between cows, and the fact that they also consume more

feed, leads to some uncertainty about the effectiveness of rbST. Second, milk prices and feed prices have fluctuated wildly over the last 15 years. When milk prices are comparatively low and feed prices are comparatively high, net profits may be negative. We showed that, between 1994 and 2002, the use of rbST was likely only profitable about half the time.

Other reasons for not using, or disadopting, rbST include concerns about its use and public perception, other ways to increase milk production and/or profitability, and increased demand for rbST-free milk.

The 2008 Survey and Preliminary Results

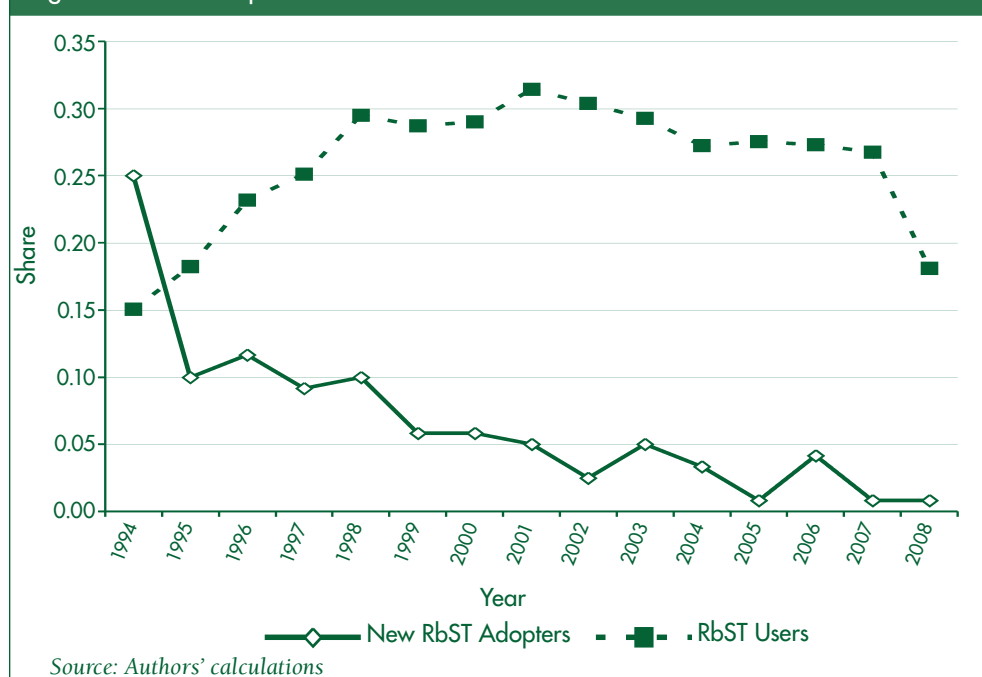
We conducted a survey of California dairy producers in the spring of 2008 to determine the extent of rbST use and the impact of supply and demand

shocks on the use and adoption of rbST. We sent surveys to approximately 1,400 dairy producers in California and received 256 responses. Producers currently running a dairy operation completed 243 of these surveys, for a response rate of approximately 18%.

The main focus of the survey was to determine the state of technology use on California dairy operations, with an emphasis on rbST. We asked questions related to the timing of rbST adoption and diffusion; the reasons for adopting and/or disadopting rbST, if applicable; the effect of the rbST shortage in 2004; and cooperatives' embargo on rbST use. Our main result is that rbST use in California is on the decline. The confluence of low profitability, increasing consumer backlash, and a shifting of demand toward more natural milk has led many dairy producers to conclude that rbST is not an effective technology.

Our results show that 42% of all respondents have used rbST at one point in time. Figure 2 shows the share of new adopters by the year of rbST adoption as well as the share of producers who are using rbST. In 1994, 25% of the producers who had ever used rbST adopted it the first year it was available.

Figure 1. RbST Adoption and Diffusion



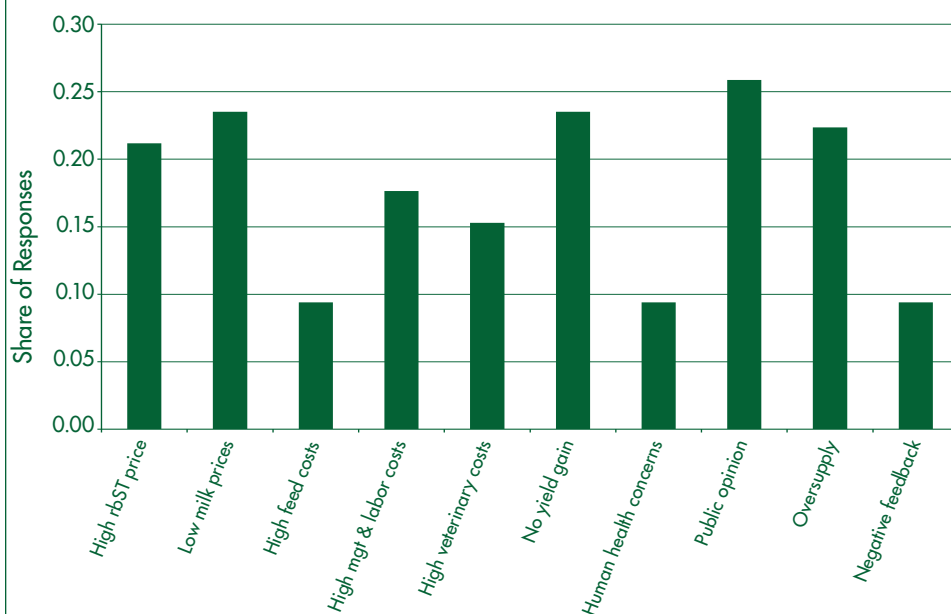
After 1994, the number of new adopters decreased but was steady until 1999. Thereafter, the number of new adopters was small and decreasing. More than 75% of all adopters did so by the year 2000. Regarding rbST diffusion, in 1994, 15% of dairy producers were using rbST. Peak rbST use occurred in 2001, when just over 31% of producers were using rbST. The share of producers using rbST has declined since 2001 and was 18% as of 2008.

Slightly over 17% of respondents were still using rbST at the time of our survey. On average, these producers treated 47% of their herd with rbST, which is higher than the figures obtained in earlier surveys. Another figure that has increased is the share of disadopters: 35% of producers in our survey had disadopted rbST. The reasons for disadopting are varied, and Figure 2 shows ten possible factors and the share of respondents who claimed that particular reason was a “very important” determinant in their decision to disadopt rbST. Our results suggest that the most important factors leading to disadoption are: high price of rbST (21%), low milk prices (24%), no yield gains (24%), fears about negative public opinion (26%), and an oversupply of milk (22%).

The effect of the 2004 shortage on rbST was severe: over 80% of our respondents said that the shortage had a negative effect on their rbST usage. These negative effects included delaying the onset of rbST use, treating fewer cows with rbST, and injecting rbST every 28 days instead of the prescribed 14-day cycle. Moreover, just over 9% disadopted rbST as a direct result of the shortage.

Many of the milk producers surveyed were asked by their buyers to stop using rbST, whether or not they were actually using it at the time. Of the current users, fewer than 10% were asked to stop using rbST. However, over 45% said that their

Figure 2. Reasons for Disadopting RbST



Source: Authors' calculations

Note: Respondents were allowed to select more than one reason as being “very important” in their decision to disadopt rbST

buyer offered a premium for rbST-free milk, ranging from \$0.05–0.35 per hundredweight of milk.

Due to the small sample size, the robustness of our results and representativeness of California’s dairy producers cannot be assured. However, our results on rbST adoption and diffusion are consistent with those collected at the national level.

Conclusions

The major trends that emerge from our survey data are: first, rbST use has declined both in terms of the number of users and the intensity of use; second, demand pressure from retailers and processors has played a significant role in the producer’s technology choice decision; and third, many producers believe the future of dairy production in California will not include rbST.

RbST has been in use for nearly 15 years now, but it appears that its future as part of the management system on California dairies is in jeopardy. Results from our latest survey show that rbST is being used on the smallest share of dairy operations since its commercial introduction in 1994. Future work on

this data set will consist of estimating the determinants of rbST adoption and disadoption; the effects of the 2004 rbST shortage; and the factors that affect the diffusion of rbST at the individual and state level.

Henry An is a Ph.D. candidate and Leslie J. Butler is a Cooperative Extension specialist, both in the Department of Agricultural and Resource Economics at UC Davis. They can be reached by e-mail at an@primal.ucdavis.edu and butler@primal.ucdavis.edu, respectfully.