Consumer Attitudes toward Milk Products Produced from Cloned Cows

Leslie J. Butler, Marianne McGarry Wolf, and Stacey Bandoni

The use of simulated test-marketing technology and concept exposure for a branded and priced milk product shows that consumers had similar purchase interest for the full-priced product and the product offered at a 25-percent discount when they were told that the reason for the discount was that the product was produced using biotechnology. Furthermore, there was a slight reduction in purchase interest in the discounted milk when consumers were told that the product was from cloned cows. However, when consumers were offered the conventional product at the market price and they were later told that the product was from cloned cows, the purchase interest dropped from 25 percent to only 6.3 percent. Thus if producers adopt the cloning process and do not educate the consumers and pass along the benefits of lower-priced milk, it appears that consumers will react negatively when they learn of the change in production method and may purchase a different brand or type of milk.

The introduction of the products of cloned animals onto the U.S. food market extends the introduction of the products of other genetically modified agricultural products onto markets over the last 10 years and is also a natural progression of the use of improved animal-breeding technologies such as *in vitro* fertilization and embryo transfer. Cloned animals have become increasingly available in the last five years, but the products of these animals and/or their offspring have been withheld pending approval of the safety aspects of the food.

While the prospect of the products of cloned animals (dairy, beef, pork, and poultry) being released onto the U.S. market for general consumption is relatively new, a market structure that incorporates the products of other genetically modified foods has been established over the last ten to 15 years. It is expected that as more genetically modified foods are approved and find their way into U.S. food and fiber markets, these markets will evolve in a way that will accommodate the new food products and will, in many ways, dictate their success or failure.

The FDA has endorsed the findings of a 2002 National Academy of Science report it commissioned that found that food products derived from cloned animals do not "present a food safety concern." The cloned animals themselves are not likely to find their way onto the market because they are breeding stock, and will likely be considered too valuable to sell for slaughter. However, the offspring of these cloned animals are likely to be part of the future meat and milk supplies for U.S. markets. The question then is, "What is likely to be the reaction of consumers?" This research examines consumer response to milk from cloned cows.

Butler is marketing specialist, Department of Agricultural and Resource Economics, University of California, Davis. Wolf and Bandoni are professor and student, respectively, Agribusiness Department, California Polytechnic State University, San Luis Obispo.

Methodology

This research examines 230 milk consumers in San Luis Obispo County, California. The data were collected through personal interviews using a consumer-survey instrument during February, 2006. San Luis Obispo County was designated the best test market in the United States by *Demographics Daily* (Jackoway 2001). San Luis Obispo was found to be the best of 3,141 counties to represent a microcosm of the United States based on 33 statistical indicators. Simulated test-marketing research is a valid methodology that has been used by the marketing community since the 1960s to forecast purchase interest in new products and new positionings for existing products (Clancy 2005).

A two-cell study design is used to examine consumer response to milk from cloned cows (Table 1). There were 136 consumers in the test cell (Cell 1), where the branded milk product was priced at a 25-percent discount ($2.42 for a half gallon) with the positioning: "This milk is 25 percent less expensive because it is produced using biotechnology!" Consumer purchase interest was examined after exposure to this concept (Test 1). In addition, a second purchase interest was examined for this concept after the consumers were informed that the

Table 1. Two-Cell Study Design and Responses.

	Cell 1	Cell 2	Total/chi-square+
Number of respondents	136	94	230
Test 1 (Initial market offering)			
Price of milk	$2.42 per ½ gal.	$3.21 per ½ gal.	
Milk production method	Biotechnology	Conventional	
Purchase interest	25 percent	26.6 percent	25.7 percent (0.785)
Knowledge of concept of biotechnology			
Cow treated with rBST	51.9 percent	54.3 percent	52.9 percent
Cloned cows	44.5 percent	34.1 percent	40.2 percent
Offspring of clones	28.7 percent	22.3 percent	26.0 percent
Do not know	25.8 percent	29.4 percent	27.2 percent
Test 2 (After informed that milk was from cloned cows)			
Price of milk	$2.42 per ½ gal.	$3.21 per ½ gal.	
Milk production method	Cloned cows	Cloned cows	
Purchase interest	22.8 percent	6.3 percent	16 percent(0.001**)

* Significant at the 0.10 level.
** Significant at the 0.05 level.
+ Chi Square Test for independence between variables.

milk was from cloned cows (Test 2). The control cell (Cell 2) examines 94 consumers who were exposed to a conventionally produced milk product with the same brand name at the market price of $3.21 for a half gallon. Purchase interest was examined for this milk product at the market price (Test 1). In addition, the purchase interest of the control-cell consumers for the branded milk product was examined a second time, after they were told the existing milk product is from cloned cows (Test 2).

Purchase Interest in the Branded Milk Produced Using Biotechnology

Consumers were asked to rate the certainty with which they would purchase the product in the next twelve months. Consumers indicating a purchase interest of 80 percent or higher after concept exposure were considered to be likely purchasers of the branded milk product. Approximately 25 percent of the consumers in both cells indicated that they were likely to purchase the branded milk product. After the initial concept exposure, consumers were asked what they think describes milk that is produced from a cow using biotechnology. Multiple responses were acceptable. Over half, 53 percent, indicated that it is from a cow treated with hormones. A slightly smaller proportion, 40 percent, indicated that it is from cows that are clones, and 26 percent thought that it is milk from the offspring of clones. Thus the cloning concept was a possibility to many of the consumers before they were informed that the product was from a cloned cow. However, 27 percent of respondents indicated that they did not know what describes milk that is produced from cows using biotechnology.

Consumer purchase interest dropped to 16 percent of consumers from both cells when they were informed that the product was from cloned cows. Consumers who were exposed to the control cell (Cell 2)—the conventional market product without a biotech positioning—were significantly less

likely to purchase the cloned milk product. The additional information that the reduced-priced milk was from cloned cows reduced the purchase interest only slightly, from 25 percent to 23 percent, for the consumers who were informed that the milk was produced using biotechnology. However, for the control cell, purchase interest dropped from 25 percent to just 6.3 percent. Thus it appears that when consumers are informed that biotechnology is used for the benefit of lower-priced milk, consumers are accepting of the cloned milk. However, when the conventional brand sells its product at the existing market price and does not inform the consumer that the milk is from cloned cows, there is a backlash effect. It appears that approximately 80 percent of likely buyers of the branded milk will not purchase it if they learn that the product is from cloned cows, but were not informed by the producer of the milk. Further evidence of this backlash effect can be observed in consumers' responses after the concept exposure and information that the milk product was from cloned cows. Consumers were asked, "How good of an idea do you think it is to produce milk from cows that are clones to make the milk less expensive?" Half of the consumers who were not initially informed that the milk product was from cows using biotechnology indicated that producing milk from cows that are clones to make milk less expensive is a bad idea. However, less than a third of the consumers that were first informed that discounted milk was available through biotechnology thought that producing milk from cows that are clones to make milk less expensive is a bad idea. This is further evidence of an interaction effect between information and attitude. Both consumer education and passing along the financial benefits of cloning to consumers appear to be extremely important for the successful introduction of milk from cloned cows.

Milk-Purchasing Behavior and Attitudes

In addition to the use of simulated test-marketing methodology to examine purchase response to a branded and priced milk product, milk consumers were also asked general attitudinal questions concerning biotechnology and milk production. As discussed above, responses to the question "How good of an idea do you think it is to produce milk from cows that are clones to make the milk less expensive?" differ between those informed and those not informed about the use of biotechnology and a price reduction. In total, 19 percent of consumers thought that it was an excellent or very good idea, 42 percent thought that it was a somewhat or slightly good idea, and 39 percent thought that it was a bad idea. Thus consumers were divided in their attitudes concerning milk from cloned cows. When asked to explain the reason for their attitudes concerning milk from cloned cows, responses included "not enough information," "against cloning," "not natural," "against human nature," "cloning is not the way God intended it," "heath reasons," and "need more information." A majority of the consumers who did not think it was a bad idea indicated that cheaper milk is an acceptable benefit of cloning.

In order to understand more about consumer attitudes toward cloning, the survey respondents were segmented into three groups: those who thought cloning for cheaper milk was a bad idea, those who were skeptical, and those who thought it was a good idea. While there were no statistical differences between the three groups in the amount of money spent on milk, the volume of packages of milk they purchased, or the proportion of types of milk they purchase, there are statistically significant differences between the groups concerning their propensity to purchase milk products produced using biotechnology and the characteristics they desire when purchasing milk.

Desirability Ratings of Milk Characteristics

A successful product positioning is based on a number of factors that motivate consumers to purchase one product versus other products. In order to develop a successful positioning for a milk product, the characteristics that are desirable to consumers when they shop for milk must be identified. The characteristics that consumers want when they purchase milk were examined by desirability ratings (Clancy 2005). The most desirable characteristics should be used in the development of a product positioning since those are the most important to consumers when they purchase a new product.

Consumers in this survey were asked to rate the desirability of nineteen characteristics of milk when they make a decision to purchase milk. They were asked the following question:

> "The following list shows features people may look for when they purchase milk. Please indicate the desirability of each feature by giving me a number from one to five. Five means the feature is extremely desirable, three means it is somewhat desirable, and one means the feature is not desirable at all to you when you purchase milk."

Based on the rankings of all respondents, the extremely to very desirable attributes of milk are: safe, fresh tasting, high in quality, healthy, flavorful, high in nutrition, wholesome, and a good value for the money. The very to somewhat desirable attributes of milk are: reasonably priced, inexpensive, rbST free, from cows grazed on pasture and organic. Interestingly, the only slightly desirable characteristic of milk is "less expensive through biotechnology."

The consumers who indicated that producing milk from cloned cows was a bad idea rated the characteristics concerning safety, high quality, health, nutrition and wholesomeness as more desirable relative to those who are skeptical about cloned milk or who think that milk from cloned cows is a good idea. Furthermore, they rated the characteristics, rbST-free, organic, and from cows grazed on pasture higher than did the consumers who did not think milk from clones was a bad idea (Table 2). It is not surprising, then, that milk consumers who think milk from cloned cows is a bad idea read nutritional and ingredient labels more often, because it is more important to them that the milk is safe, healthy, and wholesome. It is also not surprising that these same consumers think that mandatory

Table 2. Desirability Ratings of Milk Characteristics.

Ranked by total/all responses	Bad idea N = 87	Skeptical N = 93	Good idea N = 42	Total/all N = 224	P-value of F-test[F]
Very to extremely desirable					
Safe	4.736	4.581	4.381	4.603	0.055*
Fresh tasting	4.678	4.624	4.214	4.567	0.003**
High in quality	4.609	4.452	4.19	4.464	0.016**
Healthy	4.552	4.366	4.024	4.379	0.002**
Flavorful	4.483	4.398	4.095	4.375	0.059*
High in nutrition	4.437	4.355	3.81	4.286	0.001**
Wholesome	4.494	4.194	4.048	4.286	0.021**
A good value for the money	3.793	4.194	4.214	4.045	0.019**
Somewhat to very desirable					
Reasonably priced	3.885	4.097	3.952	3.991	0.301
Inexpensive	3.517	3.763	3.571	3.634	0.316
rBST free	3.759	3.28	2.786	3.371	0.000**
From cows grazed on pasture	3.644	3.108	2.524	3.21	0.000**
Organic	3.345	3.032	2.333	3.022	0.000**
Somewhat desirable					
Cheaper through biotech	2.253	2.806	3.19	2.656	0.000**

* Significant at the 0.10 level.
** Significant at the 0.05 level.
[F] F-ratio for independence of means between groups.

labeling of food produced using biotechnology is more important relative to those who are skeptical about cloned milk or who think that milk from cloned cows is a good idea, although in general a significant proportion of all three groups (80–90 percent) thought that mandatory labeling of food produced using biotechnology was important.

Demographics

Consumers who thought that producing milk from cloned cows was a bad idea were more likely to be female, older, married or married in the past, not employed, and to have higher incomes relative to those who did not think producing milk from cloned cows is a bad idea. However, there were no statistical differences in levels of education, number of people in the household, and presence of children in the household. Finally, the differences between consumers who thought that producing milk from cows that are clones was a bad idea and those who are skeptical or who think it is a good idea do not appear to have significantly different political-party affiliations.

Summary

The use of simulated test-marketing technology and concept exposure for a branded and priced milk product shows that consumers had similar purchase interest for the full-priced product and for the product offered at a 25-percent discount when they were told that the reason for the discount was that the product was produced using biotechnology. There was a slight reduction in purchase interest in the discounted milk when consumers were told that the product was from cloned cows. However, when consumers were offered the existing product at the market price and they were later told that the product was from cloned cows, the purchase interest dropped from 25 percent to only 6.3 percent. Furthermore, half of the consumers who were not initially informed of the use of biotechnology and cloning thought cloning was a bad idea to use for producing cheaper milk, while less than one-third of the consumers who were informed of the use of biotechnology thought cloning was a bad idea to use for producing cheaper milk. The combined lack of a consumer benefit and education can cause a backlash effect among consumers toward the use of cloning to more efficiently produce milk. Thus if producers adopt the cloning process and pass along the benefit of lower-priced milk without educating consumers, it appears that consumers will react negatively when they learn of the change in production method and may purchase a different brand or type of milk. This negative reaction is considered a "backlash effect."

General attitudes toward producing milk from cloned animals are mixed among milk consumers. Approximately 39 percent of consumers thought it was a bad idea, and another 42 percent were skeptical. Only 19 percent thought that producing milk from cloned cows is a very good or excellent idea. Among the reasons why many consumers believe that producing milk from cloned cows was a bad idea were lack of information and a perception that it could result in problems of safety or health. Thus it appears that it is very important that the industry educate consumers about cloning cows and producing milk from them and/or their offspring.

References

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