Food Policy 74 (2018) 1–8

Contents lists available at ScienceDirect

Food Policy

journal homepage: www.elsevier.com/locate/foodpol

A field experiment on consumer willingness to accept milk that may have come from cloned cows☆

Kofi Britwum[a], John C. Bernard[b,*]

[a] School of Economics, University of Maine, Winslow Hall, Orono, ME 04469, United States
[b] Department of Applied Economics and Statistics, University of Delaware, 213 Townsend Hall, Newark, DE 19716, United States

ARTICLE INFO

Keywords:
Animal cloning
Willingness-to-accept
Milk
Field experiment

ABSTRACT

FDA policy states that meat and milk from cloned animals is as safe as those from conventional animals and thus such products do not need to be labeled. Therefore if the voluntary moratorium on these foods were to end, consumers would be uncertain which items were products of cloned animals. This study examined consumer willingness to accept (WTA) milk that may or may not have come from cloned cows to judge the market impact of this policy. Non-hypothetical field experiments at four diverse locations were conducted to determine the amount consumers would require to switch from a cup of conventional milk to one with potentially cloned cow milk. Nearly a third of participants submitted the maximum request of $5, indicating a complete unwillingness to switch, while another quarter requested no compensation. Tobit model results showed opinions, attitudes, and shopping habits highly influenced consumers' WTA. Accompanying survey results found a neutral opinion and low knowledge of cloning, but strong support for labeling despite being informed of the FDA conclusions. Given these findings, in the absence of policy changes voluntary labeling of milk as not being from cloned cows could be a likely future outcome.

1. Introduction

Advances in agricultural biotechnology have made animal cloning another viable reproductive technology for farmers and ranchers. As the science has moved forward since the first cloned sheep, Dolly, in 1996, animal cloning has created the potential to transform the beef and dairy industries by offering farmers the option to clone their best breeding stock or milk producing cows. Many countries besides the US, such as China, Germany, Australia, and Japan participate in animal cloning, with cattle, pigs and goats the most popular cloned species. The potential for meat and milk from these animals to enter the US food supply passed one hurdle when, in 2008, the Food and Drug Administration (FDA) concluded that meat and milk from clones of cattle, swine and goats, and the offspring of clones from any species traditionally consumed as food, are as safe to eat as food from conventionally bred animals (FDA, 2008). In conjunction with this, the FDA announced that there would be no mandatory labeling requirement for foods from cloned animals.

Such products do not currently exist in the marketplace as companies with cloned animals in their stock continue to follow the voluntary moratorium, a position supported by the United States Department of Agriculture (Knight, 2008). If or when they do, however, the above FDA ruling means consumers will be unable to tell if the milk or meat they are purchasing was the product of a cloned animal. There could be ramifications for these markets and overall consumer welfare depending on the public's reaction. A key consideration is how willing consumers will be to accept products from cloned animals. Opponents of animal cloning mention issues from ethics to environmental impacts and concerns regarding the health of cloned animals and the safety of food products from clones. Nonis et al. (2010) reported that consumers expressed moral and ethical misgivings towards the adoption of cloning for food purposes. Even when consumers were provided credible information from the FDA about animal cloning, attitudes towards cloning had a strong influence on purchase intentions.

Other studies have examined consumers' attitudes towards and willingness to pay (WTP) for cloned animal products. Brooks and Lusk (2011) surveyed US consumers and reported that approximately 31% were willing to consume meat and milk products from cloned animals whereas about 43% were unwilling. Butler et al. (2008) found only slightly lower purchasing interest for milk from cloned cows when offered at a discounted price. However, when consumers were initially unaware the milk was from cloned cows and not given a price discount,

☆ The authors are grateful to the Applied Economics and Statistics Department of the University of Delaware for providing funding for the study.
* Corresponding author.
E-mail addresses: kbritwum@udel.edu (K. Britwum), jbernard@udel.edu (J.C. Bernard).

https://doi.org/10.1016/j.foodpol.2017.10.006
Received 10 April 2016; Received in revised form 16 October 2017; Accepted 30 October 2017

their purchase interest dropped substantially when they were informed. They underscored the importance of consumer education on animal cloning prior to introducing milk from cloned cows to avoid a backlash, noting that lower retail prices were not sufficient. Jones et al. (2010) found about 59% of their survey participants were willing to pay more for meat with a label indicating it was not a product of a cloned animal, while around 40% were not.

A disadvantage of the previous studies has been their hypothetical nature. This study instead utilizes a non-hypothetical field experiment, with subjects faced with an actual consumption decision. By requiring consumption of a real product, subjects were encouraged to be more thoughtful about the compensations they requested to mitigate potential bias (Fox, 1995; Lusk et al., 2004). A second contribution of the design was in having the selected product, milk, be described as possibly being from a cloned cow to mirror the future scenario should products from cloned animals be introduced without mandatory labeling. Lastly, rather than the typical WTP set-up, a willingness to accept (WTA) design was used to more directly gauge aversion to the uncertain milk product. This technique has been noted to resemble market conditions where consumers make the choice to accept products if they are compensated with lower prices (Lusk et al., 2004; Moon et al., 2006).

Using the WTA approach, the primary goal of this study was to determine the minimum compensation consumers would need to be paid to exchange a cup of milk from conventional cows for a cup of milk that may or may not have originated from cloned cows. Part of this was to conduct the study at four diverse locations to best capture potential differences in attitudes across various segments of the population. Secondary goals included examining consumers' opinions and knowledge of animal cloning, their views on labeling, and whether they believe the technology should be used.

2. Experimental design

A prominent issue in the experimental design was a desire to avoid deception. Deception, while allowed in experiments in fields such as psychology, has traditionally been unacceptable in economics. However, there has developed a good deal of debate over the precise meaning of deception and what designs within that broad context might be allowable. Rousu et al. (2015) and Colson et al. (2015) proposed a deception taxonomy and looked at both researchers' and student subjects' opinions of various forms. Clearly not acceptable was selling a product that was not as the experimenters defined, meaning that claiming conventional milk actually came from a cloned cow would be viewed as a severe form of deception. Obtaining milk from cloned cows would alleviate these concerns and indeed we contacted businesses with cloned cows and found that obtaining milk from them, while difficult due to transportation issues, would be feasible.

However, a second important issue in the design was to match the actual market conditions if the voluntary moratorium on cloned products were to end. Given that labeling would not be required under current policy, it could not be expected that any milk container would voluntarily be labeled as including cloned cow milk. Thus, the value of someone's WTA milk certain to have come from a cloned cow would not be especially useful from a policy perspective. Rather, each container would be accurately described as "may or may not" contain milk from a cloned cow in the absence of the moratorium and mandatory labeling. Using this market-based design additionally increased the potential contribution of this study as the "may or may not" scenario has not been explored elsewhere.

The issue then is if use of the description "may or may not" in the situation where the researchers know the answer remains a form of deception. While this could be considered deception by omission, an open question could be if any food study is completely devoid of such deception. As noted by Colson et al. (2015), all papers examining the influence of information on consumer demand use deception by omission. One could argue that there are always details omitted in food experiments. For instance, many omit brand names to avoid such biases. Ellison et al. (2016) showed that for organic foods, even the purchasing venue, which is nearly always omitted, influences WTP results. Within the taxonomy, deception by omission is in the least severe category and both pairs of survey respondents voiced little concern over the practice. Thus it was believed the benefits of the following design in gaining non-hypothetical WTA values, while matching future market conditions (in which this omission will be allowed by companies under FDA policy), outweighed possible concerns by some. The view of the researchers though was that this study did not use deception as, following Hey (1998), subjects were never told the "wrong things." Indeed, the design carefully avoids doing this.

Following the design outline and guidelines above, field experiments were conducted at four different locations in Delaware in October 2012, generating a total sample of 148 participants. The locations and days were selected to help capture a wide variety of backgrounds and opinions to aid in modeling and make the results as generalizable as possible within the typical limits of field experiments. The locations were a public park in New Castle County, a natural foods store (which also had a farmer's market), an urban farmer's market in Wilmington, and the University of Delaware campus in Newark.[1] The first two were visited on weekends and the latter two during the week. The park was chosen as the best representation of the general population as a popular place for many in the surrounding community and was indeed the most demographically diverse group in the sample. The natural food store in the college town setting gave access to those perhaps more knowledgeable, and potentially more opposed, to animal cloning. An urban population was captured with the sample in Wilmington, the largest city in the state. Most participants were there to have lunch on their breaks from the surrounding office buildings since food service was a substantial part of the urban farmer's market. The location of the market near a busy city sidewalk allowed other participants to be pulled in from the street by signs advertising a food study. The campus location consisted of students and gave a view of the acceptance of such products from the next generation of consumers. As most students were from the agricultural college, it was expected their knowledge would also be relatively high.

Approximately four hours was spent at each location, with each participant spending about five minutes on the experiment. Typically, a session began with setting up a tent, a table, and signage announcing a University of Delaware research project. Near the table was a cooler with ice containing two gallon-size containers of 2% milk. The brand name for one of the gallons was removed to represent the "may or may not" milk that could potentially have originated from a cloned cow. The second gallon of milk that still had the brand name represented conventional milk.[2]

Potential participants were approached and asked if they would be willing to take part in a short study on milk where they could earn between $2 and $7. The only requirements noted were that they drink milk and were over 18 years old. For those agreeing, they were read the following statement regarding the FDA's ruling (FDA, 2008) and potential for milk from cloned cows:

> *"The FDA has decided that meat and milk from cloned cows is as safe to eat and drink as meat and milk from conventionally bred cows. Due to this, if milk from cloned cows enters the market, it will not need to be labeled and you will not be able to tell if you are drinking it or not. While milk from cloned cows is not currently in stores, it does exist and we have previously contacted some farms and companies that have cloned cows."*

[1] We considered having the experiments in grocery stores, but no grocery store we approached was willing to grant us permission, wary that their animal products might be associated with cloning.

[2] Both milk containers were the same store brand and were purchased right before each session to be sure they were fresh.