



## Executive Summaries

### The market for genetically modified foods: consumer characteristics and policy implications

GREGORY A. BAKER AND THOMAS A. BURNHAM

Recent events, such as the inadvertent introduction of StarLink corn into the food supply, have apparently increased U.S. consumers' awareness and concerns regarding foods that are the product of GMOs. This research was conducted to develop a better understanding of the extent to which the GMO content of a food product influences consumer preferences for that product and to explore the relationship between consumer characteristics and preferences for GMO food products.

The primary research tool was conjoint analysis. A hypothetical product was defined as an 18 oz. box of corn flakes cereal with three attributes, brand, price, and GMO content. There were two levels of the brand attribute, national and store, three levels of the price attribute, \$2.75, \$3.50, and \$4.25 per box, and two levels of the GMO attribute, GMO Corn and Non-GMO Corn. A full factorial design was used, whereby participants were asked to rate every possible combination of the attributes. The survey was mailed to a random sample of 2,000 U.S. individuals in June and July of 2000. The response rate was 21%.

Part-worth scores were estimated for each variable and used to calculate relative importance scores. For the sample as a whole, the analysis indicated that the influence of each of the three attributes, brand, price, and GMO content were roughly equal. However, when cluster analysis was used to group respondents based on the similarity of their preference functions, three distinct segments emerged. The segments were formed around each of the attributes, with the 155 respondents in segment 1 having a strong preference for a national brand, the 116 respondents in segment 2 having a strong preference for avoiding GMOs, and the 112 respondents in segment 3 having a strong preference for a low-priced product.

Several important differences were found among consumers in the three segments. Consumers in the price sensitive segment tended to be younger, better educated, and earn higher incomes than consumers in the other two segments. However, the best discriminators of consumers in the GMO sensitive segment were the risk aversion and GMO opinion measures. Consumers who wished to avoid GMOs were more averse to risk and less likely to

believe that GMOs would positively affect the quality or safety of food than were consumers in the price or brand sensitive segments.

The results of this study indicate that consumers who wish to avoid GMOs are best identified based not on *who they are*, but on *what they believe*. An implication of this result is that producers of GMOs may want to initially target early adopters who tend to be more willing to accept risks. Food producers may also want to focus on developing GMO products with tangible benefits that consumers can easily perceive.

Policymakers may want to consider whether GMO products should be labeled. Mandatory labels, would likely satisfy those consumers who are concerned about the risks of GMOs and skeptical of the benefits. However, such a policy would certainly be opposed by advocates of biotechnology. Another option is labeling guidelines that would ensure that labels are uniform and backed by sound science. Such labels could be used as a basis of product differentiation.

## **Measuring the impact of generic promotions of U.S. beef: an application of double-hurdle and time series models**

RONALD W. WARD, WANKI MOON AND SARA MEDINA

Generic promotions have become an integral part of the U.S. beef industry and it is essential that the economic impact on beef demand be known. Three independent methods drawing on separate data bases and econometric models were used to estimate the impact of the generic promotions of beef. Sample selection type models applied to household purchasing and household servings data show the generic programs to have a positive and statistically significant impact. Similarly, time series models applied to market disappearance data show similar positive gains from the promotions. Simulations were then used to illustrate the range of gains attributed to the promotions. Very similar conclusions about the economic gains from the generic promotions were shown when comparing the three approaches.

## **Influence of brand name and type of modification on consumer acceptance of genetically engineered corn chips: a preliminary analysis**

JAYSON L. LUSK, MELISSA MOORE, LISA O. HOUSE AND BERT MORROW

Despite widespread adoption and acceptance of genetically engineered crops by agribusinesses and farmers, consumers appear to be less convinced of the benefits of the technology. Because of consumer concern about genetically engineered foods, agribusinesses have begun to alter marketing and public relations strategies in an attempt to change consumers' perceptions of genetically engineered foods by focusing on genetically engineered products that have benefits for the consumer. Whether such a strategy will be

successful in the long run is an issue open for debate. One of the primary goals of this research is to determine if consumers are more accepting of foods that have been genetically engineered to provide a benefit for them, as opposed to a benefit for the producer, to determine the potential success of current agribusiness promotion and research and development strategies. A concurrent research goal is to determine how important factors such as brand loyalty are in consumers' purchasing decision relative to any concern they might have for genetic engineering.

To provide an initial investigation into this issue, we surveyed 270 students at Mississippi State University. We employed a choice experiment, a type of conjoint analysis, to determine the importance that respondents place on several corn chip attributes including brand name, price, location of purchase, and type of corn used in chip manufacture. The marginal utility of each attribute was estimated using a multinomial logit model. To determine the relative importance of the various chip attributes, we estimated the maximum amount the average respondent would pay for a marginal change in each quality attribute.

For our particular sample of respondents, results confirm the hypothesis that consumers are more accepting of food that has been genetically engineered to have benefits for them. Our estimates suggest that chips manufactured with corn engineered to increase shelf life could sell at a \$0.33 per bag premium over chips manufactured with corn engineered to increase farmers' crop yield. However, our sample of consumers placed roughly the same value on chips manufactured with no genetically modified corn and on chips manufactured with corn engineered to increase chip shelf life. Results of the analysis also indicate that factors such as brand equity and store loyalty have a larger influence on respondents' chip purchasing decisions than the type of corn used in chip manufacture.

Results of the analysis have several managerial implications. First, it appears that there may be reasonably large premiums available for products advertised as "GMO-free," which may provide a way to profitably differentiate a firm's product. However, agribusiness managers that promote and sell genetically engineered foods may be able to offset fears about their product by cultivating a strong bond with their clientele. Lastly, results also suggest that the new generation of biotech foods, which provide benefits to consumers rather than producers, may induce consumers to actually prefer genetically engineered foods. As such investments in biotechnology that aim to improve food quality characteristics may be a viable way to offset consumer concern.

## **Quality signals in wine marketing: the role of exhibition awards**

U.R. ORTH AND P. KRŠKA

### *The research question*

Quality has been found to be among the most prominent factors influencing consumer's choice of wine. Quality labels like wine exhibition awards (usually medals) are designed to

provide consumers with comprehensive product quality information. The objective of an applied marketing research project was to address the following questions:

- Are wine exhibition awards sufficiently important to affect consumer preferences?
- What are the price equivalents for awards of different origin and type?
- What are prices (markups) for maximum turnover?
- What makes consumers believe in wine awards?

### *Study description*

The research utilizes a conjoint experiment. A consumer survey was conducted in fall/winter 1999 in coordination with a major Czech wine producer at special wine shops in several cities and towns of the Czech Republic. In the stores, wine bottles were displayed with different medals and prices. Randomly selected customers to the stores were asked to rank bottles according to their preferences.

### *Findings/results*

At the aggregated level (complete sample) an almost equal importance of the product attributes award and price in buyers = choice was found. Moreover, individual consumer preferences for particular awards and exhibitions became visible. As a general rule, respondents exhibited the least preference for wines without awards. With a few exceptions, gold medals were valued higher than silver medals. In case of a particular wine, a silver medal awarded at an international exhibition was preferred over a gold medal from a regional exhibition. Calculating price equivalents for a number of awards and wines allowed to estimate prices for maximum turnover. The corresponding markups ranged from 2.7 to 3.5% of the original retail price. Motivational aspects driving the preference of awarded wines were found to be a higher quality assumption, confidence in better value-for-money, shopping time savings, more prestigious feelings and the perception of better taste.

### *Management implications*

Clearly, wine exhibition awards are among the important product attributes affecting consumer preferences. Attending wine exhibitions for the purpose of receiving prestigious awards that are recognized and appreciated by the clientele appears to be a basically promising strategy for producers. The results of the survey seem to suggest that the origin of the award (exhibition) affects consumer preferences. If results of more extensive studies were to indicate that target groups recognize differences in the demand level of a particular grading procedure, marketers should make every effort to satisfy consumer expectations by winning the appropriate medals. In case the buyers do not distinguish between different exhibitions, marketers could either focus on easily available medals, or educating consumers (for example, in cooperation with the organizers of the exhibition) by communicating the more stringent grading standards of a particular exhibition. Generally, these research questions can be answered only in a highly specific fashion for an individual producer or for an individual retailer.

## **Environmental supply chain management: using life cycle assessment to structure supply chains**

GEOFFREY J.L.F. HAGELAAR AND JACK G.A.J. VAN DER VORST

One of the most significant paradigm shifts of modern business management is that individual businesses no longer compete as solely autonomous entities, but rather as supply chains. The necessity for successful linkages between members of the supply chain is especially evident for food supply chains. This because of, for example, shelf life constraints and increasing consumer attention to safe food and animal, and environmentally-friendly production methods. A top priority in supply chain management research is given to the development of a normative model that can guide managers in their efforts to develop and manage their supply chain. In this article we restricted ourselves to the embedding of environmental concerns in the supply chain, that is environmental supply chain management (ESCM).

One of the supporting instruments of ESCM is life cycle assessment (LCA). The idea of integrating LCA into supply chains is gaining more support among research institutes and companies. However, there is lack of guidelines for this integration. On the bases of an extensive literature study, we argue that in-line with a differentiation between environmental care chain strategies and environmental chain performances, a differentiation between types of LCAs should be made; i.e., between compliance-, process- and market-oriented LCAs. Furthermore, to execute these different types of LCAs, the chain structure should be attuned to meet the specific requirements of each type. This study shows that the integration of the different types of LCAs in a chain bring about different chain structures, which is illustrated with a few, food-oriented case studies.

## **The rise of private food quality and safety standards: illustrations from Brazil**

THOMAS REARDON AND ELIZABETH FARINA

In the past several years, during heated debates around the WTO and public food standards, the private sector has rapidly built up an array of private food standards to assure quality and safety in a fiercely competitive market. These private standards have sometimes been to fill in for missing public standards, especially for safety, and to differentiate products and build reputation, for both quality and safety. Moreover, private standards are increasingly related to meta-management systems assuring both quality and safety at all levels of a chain, enforcing and certifying the implementation of process standards. The privatization of standards has been important for both buyers and suppliers in the chain. They tend to be formulated and imposed by buyers (retailers and processors), and are key to their cost control and reputation with consumers, thus overall competitiveness. They are imposed on suppliers, who often find that the standards imply very substantial outlays for reporting, new equipment, and training. The lucky—a relatively small subset of the original set of suppliers—tend to find that meeting the standards, with formal certification in hand, benefits their business, opens new opportunities. The excluded tend to find themselves relegated to waning and unprofitable markets.

The above points concerning the determinants and effects of the formulation and implementation of private standards are illustrated with cases from the dairy, coffee, wheat products, and coconut product chains in Brazil. The implications for policymakers and managers of retail and processing firms, are: (1) the system of private standards should be of keen interest, at least as much as public standards; (2) suppliers should gear up for substantial investments to meet stringent private standards or be excluded from supply chains; (3) scaling-up private standards into public systems will face important challenges related to access to capital (such as electrification) in poor areas, and to administration and enforcement and incentives provision.