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# Agricultural Marketing Report

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## FOOD BELIEFS

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### Introduction:

Product attributes (such as whether the product is organic) have been used to analyze consumer choices in market data. However, rather than generating utility directly, these attributes may instead be valued as a signal of a product outcome (such as nutritional benefits). For example, organic products may be valued because they are perceived as healthier, or they may be perceived as having a reduced environmental impact; “no sodium added” may communicate healthiness and improved flavor; and “cage free” may suggest improved animal welfare. In this paper, we examine how attribute information on food packaging influences outcome expectations. We show that when attributes are labeled but outcomes are unknown, the utility derived from the product attributes depends on the tradeoffs between alternative outcomes (preferences) and the perception of how those attributes determine outcomes (beliefs). In the second part of the research, we study consumer beliefs: specifically, how food labels and other package information influence expectations about nutritional and environmental outcomes for fluid milk products. Here we provide evidence that some attribute labels can bias consumers’ expectations and are therefore potentially misleading.

### Study Design:

In this study, we use a means-end approach to examine food beliefs. Consider how the means-end

approach would work for laundry detergent: The product attribute is a laundry detergent additive; the functional consequence is that the additive removes stains; psychological and social consequences would be ideas such as “I feel like a good homemaker” or “others will notice my clean clothes;” and end values or goals would be concepts such as self-esteem or acceptance. In our model, we use the means-end approach with attributes (Table 1) of fluid milk products that influence nutritional outcomes, environmental impacts, and animal welfare. To make decisions, consumers need to make a connection between attributes, which we assume to be available on product labels, and the associated outcomes, which they may not be able to directly observe. The connections between attributes and outcomes are “consumer beliefs.” If attributes are known but outcomes are not directly known, two consumers may display radically different willingness-to-pay for the same attribute, such as “organic,” only because one believes it to be “better for you, and better for the environment” while the other considers it “a marketing fad without real consequences.”

We explored consumer beliefs using a laboratory experiment designed to examine how attribute infor-

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Table 1: Attributes Used in Experiments

<i>Experiment 1: Nutritional Value</i>	<i>Experiment 2: Environmental Impacts</i>
RRR score	Cow Milk / Soy Milk
Cow Milk / Soy Milk	Colorado Proud / Not Colorado Proud
Whole / Reduced Fat	Plastic / Cardboard
Chocolate / Unsweetened	Organic / Conventional
Organic / Conventional	

Table 2: Milk and Soybean Products Used in Experiments

<b><i>Product Name / Brand</i></b>
Horizon Organic Whole Milk
365 Whole Milk
O Organics Organic Reduced Fat Chocolate Milk
Lucerne Reduced Fat Chocolate Milk
Horizon Organic Fat Free Milk
365 Fat Free Milk
365 Organic Soymilk Chocolate
Silk Chocolate Soymilk
Silk Organic Unsweetened Soymilk
Silk Unsweetened Soymilk

We explored consumer beliefs using a laboratory experiment designed to examine how attribute information displayed on food packages (Table 1) influences outcome expectations. We identify eleven milk and soy products (Table 2); the use of real products and real packaging makes the experiment more realistic and context-rich. Three different sources of information were used:

1. The attribute information on the front label
2. The nutritional panel on the back of the label
3. The Ratio of Recommended to Restricted food components (RRR). The RRR score summarizes the nutritional panel information in an index varying from one (poor) to ten (best). While not currently in use for package labeling, the RRR is available for free from specialized consumer web sites like [www.Goodguide.com](http://www.Goodguide.com). Instructions to study participants also included a brief, simplified explanation of how the RRR score is calculated based on the nutrition panel.

Experiment participants were assigned one of two tasks:

1. Rank products by nutritional value (experiment 1; 148 participants)
2. Rank products by environmental impacts (experiment 2; 96 participants)

### **Results:**

In our laboratory experiments, we identified ten milk and soy products and provided participants with three different levels of information (front panel, back panel and RRR score). We then asked them to rank the products based on nutritional value (experiment 1) and environmental impacts (experiment 2). In experiment 1, we found that the rankings did change based on the information provided. Specifically, front-of-package attribute information is either less useful in ranking products by nutritional value or it is interpreted more

subjectively. In this experiment, consumer beliefs were similar across participants, suggesting that the exposure consumers have had over the past several years to the nutritional panel helped them to connect food attributes to nutritional outcomes. This similarity in beliefs across consumers was not seen for environmental impact (experiment 2), where such associations have been left to individual perception, subjective beliefs, and firm advertisement.

Our results suggested that consumers are well aware that whole milk has more fat, as that attribute correlated with a lower nutritional ranking. However, the availability of the RRR score induced a much heavier penalty on the ranking. Chocolate flavoring was similarly acknowledged by most as a “bad” nutritional attribute (again, the RRR score penalized chocolate flavoring more than other attributes). The most interesting changes in beliefs were observed for organic vs. conventional and soy vs. cow milk. When participants were only shown the front label, “organic” was interpreted as improving nutritional outcomes; however, this belief fades as more and more information is made available to the participant. Similarly, participants made little distinction between soy and cow milk while looking at the front labels, but rankings of soy products improve substantially when more information (such as the back nutrition panel) is provided.

Based on these results, it is reasonable to expect that product choices and consumers’ willingness to pay will change based on the information provided to them, even when their preferences remain constant. Further, choices based only on attribute information appeared to be biased in a systematic way, rather than just being less informed. Results from experiment 2 indicate that, among the included attributes, consumers consider soy (vs. cow milk) to be the most influential attribute in improving environmental outcomes, followed by local production, cardboard packaging and organic production. Right or wrong, results indicated that participants, instead of randomly guessing, were extracting information related to environmental outcomes from the labels on the package.

### **Conclusions:**

A first implication of this research is that observed choices identify preferences only when it is possible to control for consumer beliefs. While marketers may be satisfied with knowing that an attribute promotes sales, welfare analysis of labeling policies requires separating preferences from beliefs. Unlike preferences,

beliefs can be wrong: inaccurate beliefs may cause some people to pay for fictional outcomes, or overly skeptical consumers may refuse to purchase something they value. Our experiment showed that, at least in some cases, attribute information may systematically bias outcome expectations. This phenomenon is likely to be even more prominent when attribute labels create outcomes that, unlike nutrition, remain unquantifiable and unregulated. For example, it is not reasonable to expect that people will form objective beliefs on the environmental effects of “shade grown” coffee when “environmental facts” panels (i.e., the analogue of a nutrition panel) do not exist.

In light of our results, it is doubtful whether the recent explosion in the number of food labels and attribute information corresponded to an equally substantive change in the implied outcomes. The development of outcome measures beyond nutritional dimensions may increase transparency, facilitate conscious consumer choices, and provide a stronger competitive pressure to innovate in outcome, rather than attribute, space. This task is complex and costly, but may pay sizable dividends, especially when outcomes have a public-good nature. For example, there is not much of an incentive for producers to experiment with innovative practices and improve environmental outcomes when firms capture the environmental premium only by following the existing organic protocol. Information, no matter how accurate, is useless in a purchasing context if it cannot be used to make quick, virtually effortless decisions, and effective labels will need to find ways to communicate quickly to consumers. The distinction between attributes and outcomes provides a simple criterion to objectively distinguish between outcomes from marketing vs. advertisement efforts.

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