

The Role of University Researchers in Marketing Research: An Application in the
Northeastern Apple Industry

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***Abstract:** In today's market, producers of agricultural commodities and value-added food products feel increasing pressure to enhance their marketing abilities. Successful marketing strategies are dependent upon analysis of current and reliable marketing information, but the availability of such information is limited for many producers by the cost of marketing research. This paper describes a university research project that seeks to provide this information to an industry whose producers are particularly in need of new and modified marketing strategies: the processing apple industry in the Northeastern U.S.*

Across the country, producers of agricultural commodities are increasingly feeling the strain of market pressures: decreased farm gate prices for their products, increased competition from international producers, consolidation of their customers, and stagnant consumption of mature products. This stress is readily apparent in today's apple industry. At most gatherings of apple growers, discussion frequently turns to marketing issues. Growers are concerned about their future in an industry characterized by low prices for apples, competition from low priced foreign apple juice concentrate, and the pressures of industry consolidation throughout the supply chain.

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The processing sector of the Northeastern apple industry is particularly strained. Low apple prices and recent plant closures by Eastern apple processors have been cause for a negative outlook among many growers in the region. Among consumers, apple product consumption has generally been stagnant in recent years.

In the Northeast, apple processors provide an important outlet for the apple industry. In New York over half of the annual apple harvest is sold in processing markets. New York apples are processed into apple juice, cider, sauce, pie slices, hard cider, dried apples, and several other apple products by processors in the state and throughout the Eastern U.S. Facing the pressures of a changing market, apple growers and processors need to make strategic adaptations to enhance their competitiveness. A current research project at Cornell University aims to provide direct assistance to the processing sector in meeting its current challenges.

Three years ago, Cornell University received an anonymous grant to support a project focused on the Northeastern apple processing industry entitled “Development of an Environmentally Sound, More Profitable System for Production and Marketing of Value Added Processing Apple Products in the Northeastern United States.” The purpose of this project is to assist growers and processors in the industry to face the challenges of the changing market and to take advantage of opportunities offered by new information and technologies related to production, pest control, product development, and marketing.

This project is interdisciplinary in its approach. The project includes faculty and staff from five departments in the College of Agriculture and Life Sciences at Cornell University: Entomology, Plant Pathology, Horticulture, Food Science, and Applied

Economics and Management, as well as Cornell Cooperative Extension. By involving a broad range of experts, the project aims to address a number of research questions on behalf of the industry. The goals of the project are:

- ◆ *To develop a more environmentally sound, cost-effective apple production and integrated pest management system,*
- ◆ *To stimulate growth of apple processing industry with new technologies that support commercial production of diversified, high value apple products, and*
- ◆ *To assess economic impacts, marketing potential, and consumer reactions to new products.*

Marketing research is just one component of this research, but an important step in addressing industry concerns. This article summarizes the marketing research component of this project. This project will be completed in June 2001, and final project reports will be available at that time.

Market Trends

As the global supply of apples is growing, the per capita supply is also growing. In 1998, the global apple supply was approximately 20.1 pounds per person (UNFAO, 2000). This level reflects 15% growth in the global supply of apples per capita over the past ten years. With expectations for continued growth in the global supply of apples, the industry faces substantial concern about future demand levels.

Figure 1 shows the average consumption levels for apples and apple products in the U.S. in 1997-1999. During this period, the average American consumed annually: 18.88 pounds of apples in juice and cider, 5.08 pounds of apples in canned apple

products, 1.02 pounds in frozen apple products, 1.08 pounds of apple in dried apple products, and 0.49 pounds of apples in other apple products

Between 1976 and 1999, total per capita (fresh and processed) apple consumption rose by 46% to over 47 pounds per person annually (see Figure 2). Most of this increase can be attributed to a 164% increase in the consumption of apple juice and cider during this period (see Figure 3). Over the same period, consumption of frozen apples increased by 15%, consumption of canned apples increased by 4%, and consumption of dried apples increased by 6%. Despite these increases over the 23-year period, all processed apple products except apple juice have experienced declines in per capita consumption in the past decade. Fresh apple consumption fluctuated over the 23-year period. It increased overall between 1976 and 1999 by 10%, but per capita consumption of fresh apples has declined in the past decade.

At the current level of consumption, the average American consumes only about one fresh apple per person each week. In 1998, the average American consumed about 288 pounds of fruit, both fresh and processed. By weight, about 16% of that fruit were apples and apple products. For comparison, Americans consumed almost 100 pounds of oranges and processed orange products per person that year. Oranges account for about 35% of all fruit consumed in the U.S. Among fruits, apples rank 3rd in per capita consumption in the U.S., behind oranges and grapes (USDA ERS, 2000).

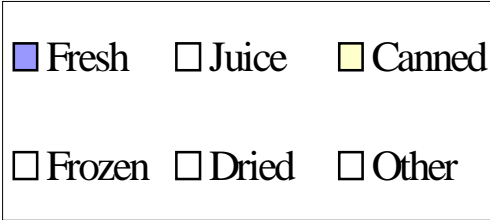
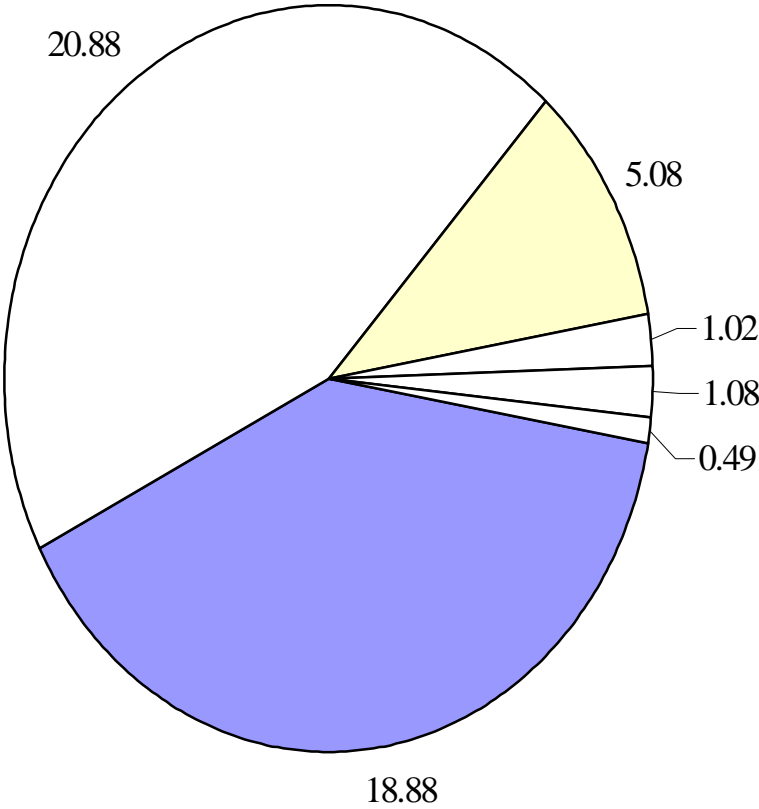
Despite the increase in apple consumption from 1976 to 1999, U.S. consumption of apples and apple products has generally been flat or declining for the past several years. The market for processed apple products shows signs of stagnation and decline. Products are generally mature, and consumers have well-established patterns of

purchasing and using these products. Investment in consumer advertising is low, and product innovation is infrequent.

In a mature industry, marketing strategies should focus on expanding existing markets and developing new markets. Existing markets may be expanded by volume consumed by existing consumers. Markets may also be expanded by promoting new product uses. New markets may be developed with new products and by reaching consumers that previously did use the product. Developing new products is a particularly important strategy in a mature market. Existing products are always vulnerable to changes in the market environment, and consumers' needs, tastes, and interests change over time. New products can be used to adapt to these changing market conditions.

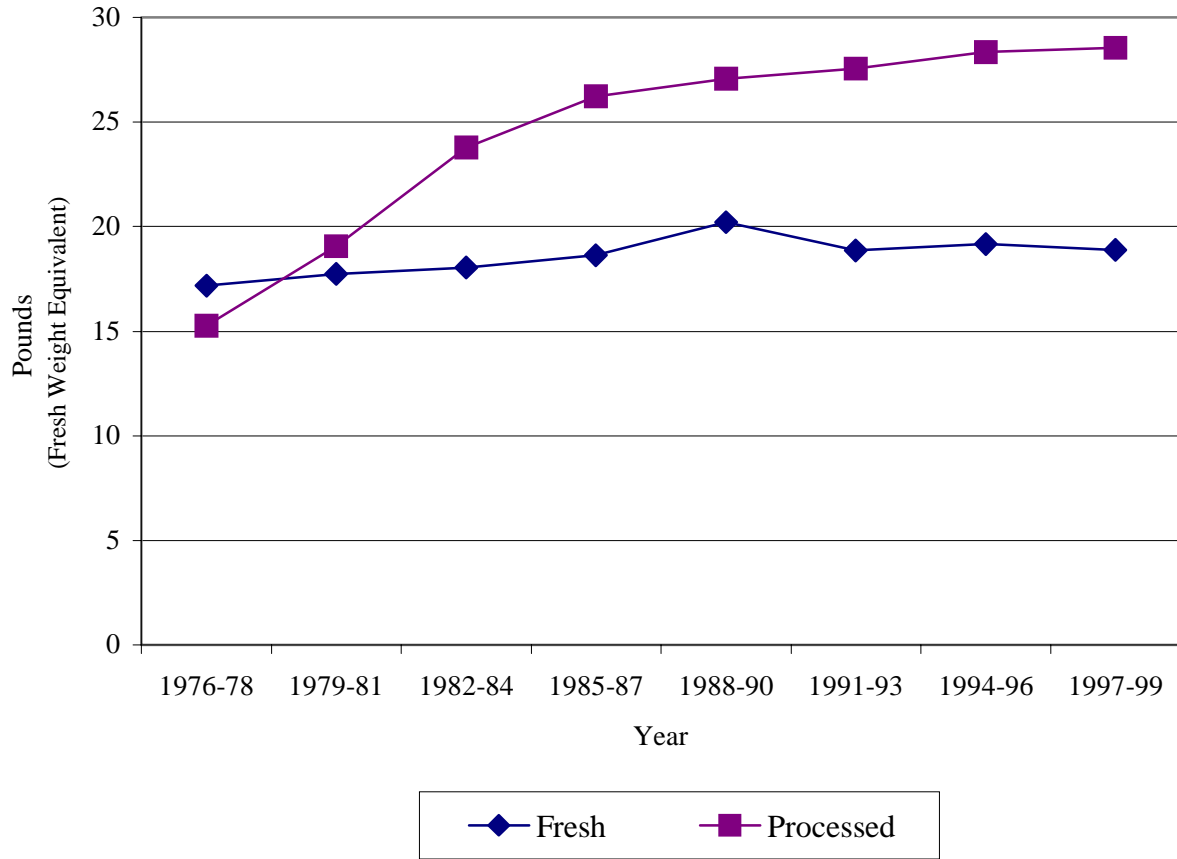
The marketing research in this project is focused on market expansion through the identification of new markets and the development of new products. A number of marketing research activities were initiated to collect information about processed apple products and markets that can be useful to the industry in developing marketing strategies. This research aims to provide a first step in advancing innovation and market expansion in the industry.

**Figure 1: U.S. Per Capita Consumption of Apples, 1997-1999
Pounds Per Person Per Year**



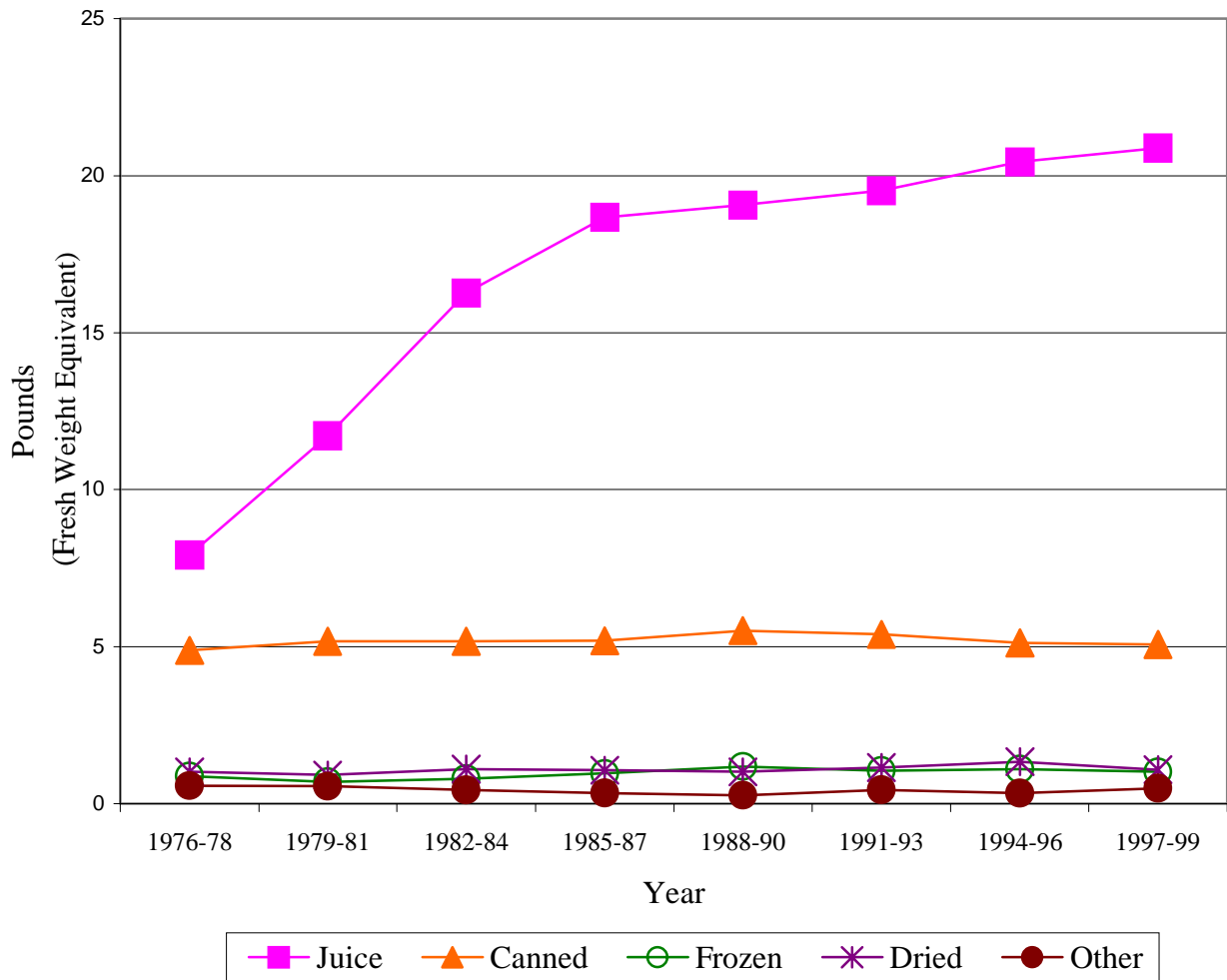
Source: USDA Economic Research Service (ERS). *Fruit and Tree Nuts Yearbook*. FTS-290, Washington, DC, October 2000.

**Figure 2: U.S. Per Capita Apple Consumption:
1976-1999
3-Year Averages**



Source: USDA Economic Research Service (ERS). *Fruit and Tree Nuts Yearbook*. FTS-290, Washington, DC, October 2000.

**Figure 3: U.S. Per Capita Apple Product Consumption: 1976-1999
3-Year Averages**



Source: USDA Economic Research Service (ERS). *Fruit and Tree Nuts Yearbook*. FTS-290, Washington, DC, October 2000.

Marketing Research

The marketing component of this project was designed to analyze processing apple markets, to develop new product concepts, and to identify new market opportunities for apple products. The agricultural economists on the project worked closely with the food scientists to consider new product ideas from both a marketing perspective and a production perspective. However, the marketing research was not limited to consideration of products that are available for sampling from the Food Science laboratories. Instead, market research was aimed broadly at identifying market opportunities by considering product concepts as well as product prototypes.

The researchers in this project were challenged to provide useful information across a broad range of product categories in the apple industry. Because it was conducted by university researchers, the project concentrated on the preliminary stages of new product and marketing strategy development. Research goals were focused on identifying opportunities, rather than analyzing the likelihood of success of specific products. The development of ready-for-market products and strategies was viewed as the responsibility of private sector processors and entrepreneurs. This research was designed to provide them with the market analyses they would need to make informed decisions.

The first steps in this marketing research project included an industry overview, the development of a project advisory council, and an apple processor survey. These steps were taken to collect background information and to support the development of a marketing research plan.

The advisory council was created to involve a diversity of opinions in discussion about the industry and its markets and products. This group meets twice annually to provide input and guidance on research plans. It also serves as a sounding board and idea generator for the project. Members of the advisory council represent growers and processors, but also an agricultural financial institution, a retail grocery chain, and industry associations.

The survey of regional apple processors was completed in 1999. The purpose of the survey was to assess processor outlook for the industry and to identify marketing challenges and opportunities. In this survey, 21 apple processors in New York, New England, Pennsylvania, and Virginia were interviewed. The interviewees represented processors that purchase almost 35 million bushels of apples annually, including about 12.5 million bushels in New York State. The processors interviewed in the survey produce a wide range of apple products including juice, cider, applesauce, frozen apples, pie filling, dried apples, cider vinegar, hard cider, and baby food.

Using the information collected from the industry overview, the advisory council, and the processor survey, a marketing research plan was developed. The objectives of the plan were to:

- ◆ *Conduct forward-looking research:* Focus on opportunity identification rather than assessment of current market conditions and trends.
- ◆ *Explore how to make apple products relevant in today's market:* Identify the motivators that are driving consumers and how to make apple products relevant in that context.

- ◆ *Identify new product and new marketing opportunities:* Use the research to assess consumer reactions to new product ideas and to identify new demographic markets that are possible areas for market expansion.
- ◆ *Identify foodservice opportunities:* Explore how to adapt apple products for greater use in foodservice markets, which are experiencing rapid growth as American consumers increase their consumption of meals away from home.

The research plan included several major activities. The purpose of each activity and a summary of findings are presented below.

1. ***New Product Development Workshop***

New York processing apple industry leaders attended a workshop in June 2000 focused on new product development. The workshop was facilitated by marketing consultants with extensive experience in new product development, and the meeting was held at a facility with a new products showcase. The facility houses a library of 65,000 consumer products collected over the past 30 years. The products in the collection offered many stories of market successes and failures, and these surroundings provided a rich environment for stimulating creative thoughts about apple products.

The workshop emphasized the importance of innovation as a key to success. New products must stimulate a consumer to take the risk of purchasing them. To do so, new products must appeal to basic consumer motivators (see Table 1). The workshop discussion was focused developing concepts for products that are relevant to today's consumer motivators. The final product of the meeting was a list of apple product ideas for further consideration. A sampling of these ideas is listed in Table 2.

Table 1: Consumer Motivators in Today's Market

- Convenience: Consumers' need for more time drives the purchase of on-the-go foods, meal solutions, and functional packaging.
- Wellness: Fears about aging, declining health, and medical costs drive consumers to prevent and self-treat health problems with food and beverage products that offer health benefits.
- Food quality and safety: Consumers are drawn to products that offer quality assurance and reliable food safety.
- Gratification: Disposable income levels have been rising in the current strong economy, and consumers are seeking indulgence for themselves and their kids. They are drawn to buy gratifying products that taste good and offer the feeling, "I'm worth it."

Table 2: Apple Product Concepts from New Product Development Workshop

- Applesauce in Squeeze-Tube Package for Kids
- Pre-Sliced Apples for Baking
- Snack Pack with Pre-Sliced Apples, Cheese, and Crackers
- Waldorf Salad Kit with Pre-Sliced Apples
- Ready-to-Microwave Baked Apples
- Apple Spritzer with Sparkling Cider and Mineral Water
- Stir-fry Sauce with Apple Chunks and Savory Spices
- Fresh Pressed Chilled Apple Juice
- Apple Cider Syrup for Pancakes and Desserts
- Apple Cider Salad Dressing
- Apple Cider Fortified with Vitamins or Herbs
- Pourable Chunky Apple Topping
- Apple Juice and Spring Water Beverage for Young Children
- Microwaveable Apple and Cheese Turnover
- Apple Slaw
- Apple and Green Tea Beverage
- Fresh Apple Cobbler or Apple Crisp Baking Kits
- Apple Cider Ice Cream

2. *National Consumer Survey*

A national survey of apple product consumers was conducted in September 2000. The survey had two main objectives. First, the survey sought to identify demographic trends in apple and apple product consumption. This information was collected in order to identify potential opportunities for market expansion to new demographic targets. Second, the survey was used to assess several of the new product concepts discussed at the workshop and presented in Table 2.

The survey findings indicate that in the current market, there are only two apple products that more than 10% of the U.S. population has purchased in the last three months: apple juice and applesauce. The limited number of broadly appealing apple products in the current market points to a need, and possibly an opportunity, for new product development in this industry. Survey results also identified demographic groups that appear more likely to purchase some apple products. These groups included families with children and African American and Hispanic households. Finally, survey results helped to identify several new product ideas that warrant further consideration and research:

- ◆ snack pack with pre-sliced apples and caramel dip
- ◆ snack pack with pre-sliced apples and cheese and crackers
- ◆ apple juice and spring water beverage for toddlers
- ◆ pre-sliced apples for eating and cooking
- ◆ apple juice spritzer (non-alcoholic)

3. *Consumer Focus Groups*

Following the survey, six focus group meetings were held with consumers in the New York City metropolitan area in October 2000. All of the group participants were women that shop for their households. Two groups were held with each of three demographic targets: women with children under 6, women between 50 and 69 years old, and women between 25 and 49 that consume wine. The groups in the last category were used in part to evaluate markets for hard cider and apple wine. Overall, the purpose of the focus groups was to explore how these consumer groups use and view apples and apple products. The participants discussed what qualities they like and dislike in apples and apple products and how they would change apples and apple products, if they could. Participants also sampled and evaluated some prototype apple products. The discussions were facilitated by a professional moderator.

The focus group discussions revealed several findings about the market for apples and apple products. Because focus groups are a qualitative research technique, these findings are not definitive results supported by statistically significant data. Instead, focus groups provide “directional” information that may identify new paths for research and development. Focus groups are a good tool in the early stages of new product development research because they can be used to explore how consumers use products, how they might like to see product improved, and what market opportunities might warrant additional research.

In these focus groups, the findings indicated that in general, apples are a highly regarded fruit. Consumers are generally aware that apples have health benefits, and they perceive apples to be healthy, but most could not name specific health benefits of eating

apples. Most of these consumers seemed to think that the benefits of eating fresh apples was somewhat diminished in apple products. In general, consumers were concerned about eating processed fruit products because of their perceptions that these products have added sugar, high levels of fat and calories, and added preservatives and other chemicals. They generally felt that apple products are limited in range, with dessert products dominating, and limited in compatibility with other food groups. These limitations apply to many fruit products, not just apples. They also indicate a need and an opportunity for new product development to increase apple product consumption and for consumer education with apple product use suggestions and recipes.

Focus group participants sampled apple product prototypes, including pre-cut apple slices, baked apple chips, spicy apple butter, and apple wine. Before any exposure to the pre-cut apple slices, the discussion in most of the focus groups had pointed to a market opportunity for this product. The participants discussed what they do not like about eating whole fresh apples, and almost all of the factors mentioned would be addressed by a fresh-cut slice product (e.g., no core, less messy, no need to cut, non-browning). When the participants tasted a pre-cut apple slice prototype, the product was generally very well received. The discussion raised several questions for further exploration in the development of the product (e.g., how to address concerns with chemical treatment, how to price the product). The participants also generally liked the baked apple chips as a snack product, but this product was not as enthusiastically received as the apple slices.

Mothers in the focus groups generally agreed that they believed, or that their physicians had led them to believe, that their young children should not be served apple

juice at full strength. They usually watered down apple juice before serving it to their young children. As a result of this widespread belief and practice, there was some support for the concept of an apple juice product that is pre-diluted with spring water and sold in single-serve bottles. This product concept appears to warrant additional product development research.

The focus groups revealed a number of other findings about apple and apple products. For example, almost none of these consumers considered the place of origin when purchasing fresh apples. However, perhaps the most important findings were the need for continuous education on the unique benefits of apple and apple product consumption and the need for the development of innovative products that will appeal to consumer desires for wholesome and convenient foods.

4. School Foodservice Survey

A survey by a committee of the New York State School Foodservice Association and NY Farms! reports that New York schools consume the equivalent of six million bushels of apples in the form of apple juice each year. Schools are an important, traditional market for apple products, including apple juice, applesauce, and canned apple products, as well as fresh apples. Like other markets for apple products, this market is changing, and to successfully serve this market, apple product producers need to understand the preferences and practices of their customers in this market. Therefore, school foodservice directors in New York State were surveyed in Fall 2000. The purpose of the survey was to explore the use of apple products in New York school foodservice programs, to examine the important factors in purchasing decisions, and to assess the relevance of apple products in today's school foodservice market.

The survey's findings indicate that overall school foodservice programs in the state are using more fresh fruits and vegetables and more pre-cut fruit and vegetables than they were five years ago. Respondents indicated that they are serving slightly more apple juice and apple sauce than they did five years ago. Compared to other fruit juices, apple juice was perceived to be average in nutrition, less expensive in price, and slightly higher in appeal. About 35% of school districts have served apple cider in the past year. Applesauce remains a ubiquitous school lunch item, and 33% are serving applesauce for breakfast on occasion as well. Most school districts do not purchase applesauce in single-serve packages; 90% reported that they never use this product. Compared to other fruit products, applesauce is perceived to be about the same in nutrition, less in price, and higher in appeal.

Pre-cut apple slices are a new product that has become available to some schools foodservice programs in the past few years. Only 25% of respondents had served the product in their schools in the previous year. Of those that had not served the product, 56% had not served it because it was too expensive, 39% had not served it because of a lack of availability, and 16% had not served it because of concerns about quality. Compared to other fruit products, this product was perceived to be about the same in nutrition and appeal and more expensive in price.

4. Foodservice Managers Focus Groups and Interviews

Recently, much attention has been given to the growing role of foodservice in food and beverage distribution in the U.S. With U.S. consumers currently spending almost half of their income on meals away from home, the foodservice sector is an important market. In November and December 2000, focus groups and telephone

interviews were conducted with managers and chefs from family restaurants and institutional foodservice operations. This qualitative research was designed to explore opportunities for increased apple product use in foodservice and to explore opportunities to develop and improve apple products for the foodservice sector.

Again, qualitative research is not designed to provide definitive results, but to allow for the exploration of customer attitudes, practices, and preferences. In these focus groups and interviews, the discussions confirmed the highly competitive nature of the market and the existence of many substitutes for apples and apple products in foodservice. Some of the discussions revealed specific sector concerns in foodservice (e.g., food allergy concerns in hospitals, the need for nutritional exchange serving sizes for healthcare facilities). The importance of consistency of product, cost savings, and labor constraints were emphasized in the results. Without prompting, the institutional foodservice managers described a need for a pre-sliced apple product before they were exposed to the product prototype. They reacted very positively to the product prototype that they sampled, and they raised a number of questions about the product that will aid in further product development (e.g., availability in peeled and unpeeled versions, storage requirements, baking performance, composition of product coating). Family restaurateurs generally reported less use of apples and apple products than institutional foodservice managers. Chefs and managers from both sectors related the importance of recipes and use suggestions in increasing their use of a product.

In addition to these major research activities, the project includes several other related initiatives, including:

- ◆ Marketing research assistance to commercial partners

- ◆ Case studies of successful marketing strategies from other food and beverage industries
- ◆ Literature review on eco-labeling to explore opportunities for eco-labeled apple products
- ◆ Publication of short “how-to” marketing articles

Final project reports will be available in June 2001.

Role of University Researchers

In planning and conducting this project, the researchers were challenged to define an appropriate and effective role for themselves in the field of applied marketing research. To ensure that their research would complement, and not duplicate, other on-going market research in this sector, the researchers met with industry leaders and surveyed apple processors to assess the scope of on-going research and market data collection. Table 3 summarizes the roles of the various parties that collect market information in the processing apple market, including university researchers. The audience, objectives, and products of university research differ from those of industry firms and associations, and these differences help to define the role of university research in this setting.

As mentioned above, most of this project’s research was focused on the preliminary stages of the new product and new marketing strategy development process. The development of ready-for-market products and strategies is best completed by the private sector parties, food processors and entrepreneurs, who are engaged in the marketing of the apple products. Research conducted at the university can be used to lay

the foundation for private sector research, but it cannot replace the proprietary studies of those with a direct interest in the market.

With the assistance of industry leaders and the project's advisory council, the researchers in this project further defined their role by developing the following criteria:

- ◆ To act as a catalyst for innovation in the market
- ◆ To stimulate interest in new product and new markets
- ◆ To not duplicate the efforts of others studying this market
- ◆ To coordinate research to complement the efforts of others studying this market
- ◆ To provide forward-looking research, not snapshots of the market's history
- ◆ To analyze the competitiveness of the regional industry from a broad perspective

A clearly defined role for the project was important in the development of a research plan that would meet the needs of the industry and leverage the resources of the university.

Conclusion

This research project demonstrates the role that university researchers can play in providing direct support in the form of marketing information to an agricultural industry. In this project, the primary role of the university researchers was to act as a catalyst for innovation in this market. The information collected in this research project alone will not improve markets for processing apples and apple products, but it can serve to stimulate future innovation and strategy development to meet the challenges of a changing market. Building on this research requires that food processors and entrepreneurs engage in additional market research that is specifically tailored to their

needs and also in the risk-taking and investment on which the future of the industry hinges.

Table 3: Market Research Roles in the Processing Apple Industry

	Audience	Objective	Product
Individual Firm	Proprietary	Increase profits Increase market share	Internal reports
Trade Associations (e.g., Processing Apple Institute)	Members	Create benefits for members	Limited distribution
Producer Groups (e.g., U.S. Apple Association, New York Apple Association)	Producers	Expand use of raw product	Limited distribution
University	General public All levels of industry	Generate public good	Open reports

References:

United Nations Food and Agriculture Organization (UNFAO). FAOSTAT Statistical Database. 2000. Available on-line: <http://apps.fao.org>

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Related Readings

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