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Analysis of consumer preferences toward 100% fruit juice packages and labels

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ANALYSIS OF CONSUMER PREFERENCES TOWARD
100% FRUIT JUICE PACKAGES AND LABELS

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABSTRACT

A national web survey was used to collected data from 253 households in the United States. Choice-based conjoint analysis was used to investigate which packaging and labeling attributes U.S. consumers consider important when choosing 100% fruit juices, and to estimate their willingness-to-pay. The attributes were packaging material, nutritional and health claims, presence of organic ingredients and whether the product was produced locally. Factor analysis, cluster analysis and a median split technique were used to identify market segments based on consumer preferences, behavior, and lifestyles. Differences between the segments were analyzed. A conditional logit model was used to estimate relative of importance and willingness-to-pay for the different attributes. Results from the study show that consumers place positive values on, and are willing to pay a premium of ($1.04) for the Polyethylene Terephthalate (PET) bottle, and ($0.29) more for the no sugar added claim. Consumers with high environmental interests were more likely to pay a premium for a fruit juice with organic ingredients and a nutritional index on the label. High information seekers are willing to pay ($0.13) more for the nutritional index, compared to ($0.05) that low information seeker will pay. Younger people are willing to pay more for local products and more than double ($1.41) of what older people will pay ($0.67) for a PET bottle.

CHAPTER I. INTRODUCTION

1. Background

Over the past few decades, food consumption habits have changed immensely. In today's society, it is common for both spouses to work outside of the home. Consequently, rising average household incomes give consumers a broad range of choices for the basic food bundle. A health aware nation and a rising interest in maintaining and improving human life are just a few reasons why fruit and vegetable demand has risen. Campaigns such as "5 A Day" promoted by the World Health Organization (WHO) encourage people to consume five fruits or vegetables per day. The food industry has responded to this demand by developing fresh and nutritional products with conservation techniques that extend the shelf life of the product (Deliza et al. 2003).

On average, consumers expend more money on fruits and vegetables that any other type of food (Bureau Labor of Statistics, 2008), see figure 1. Other food at home represents sugar, oils and fats, miscellaneous food, and non alcoholic beverages. Annual household expenditures on vegetables and fruits represents 18% of the total amount of dollars spent on food at home, around $858 per year, followed by cereals and bakery which represent $660. Dairy products accounts for $559, reports of beef account for $308, pork $205, poultry $198, fish and seafood $158, other meats $139, and eggs $63, respectively.

Vegetables and fruits are recognized for their benefits toward healthy living (Cox et al., 1996). They have essential vitamins, minerals, and fiber. A diet high in fruits and vegetables is linked to lower risk for several chronic degenerative diseases, including certain cancers and cardiovascular disease (Van Duyn and Pivonka, 2000). Moreover, it is beneficial in weight management when eaten as part of a reduced-energy diet (Rolls et al., 2004).

Average Annual Expenditure
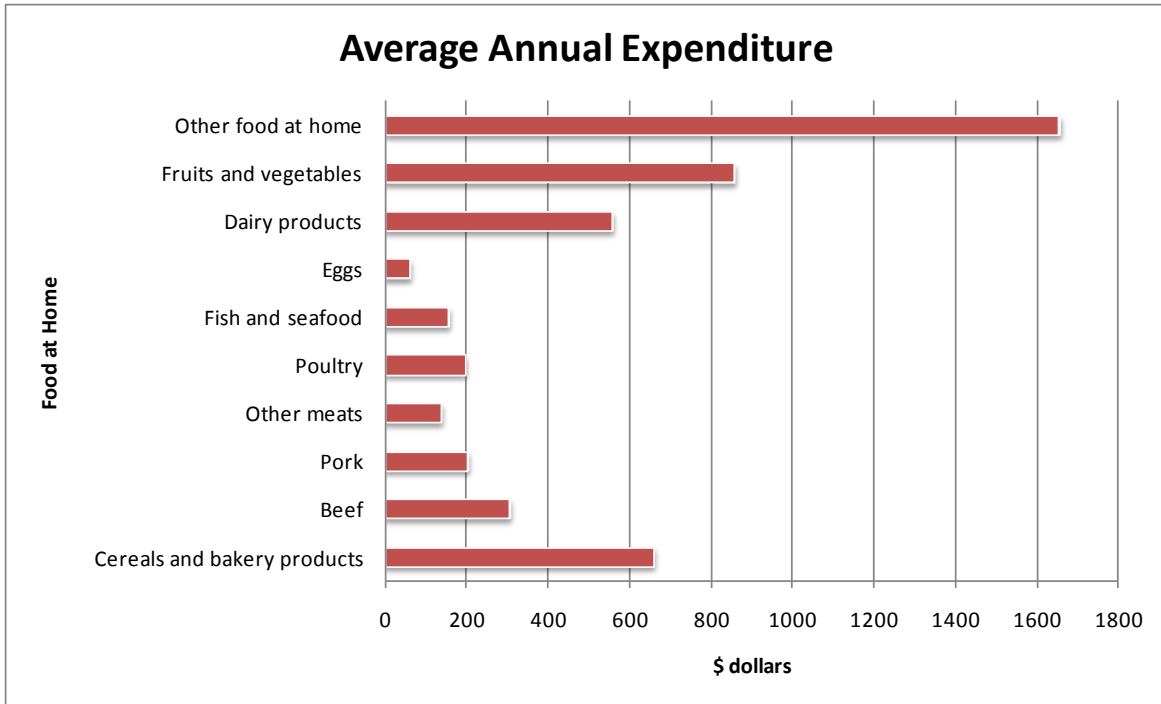
Source: Bureau Labor Statistics, 2008.

Figure 1. Average Annual Expenditures

According to Mintel (2008), annual consumer spending for juice and fruit beverages is approximately $19 billion. Fruit juices represent the major form of US per capita fruit consumption (Rosson and Adcock, 2000), accounting for forty four percent of commercially marketed fruit products in 2000 (Thor and Savitry, 2001). Mintel International Group findings reported that thirty eight percent of the respondents are drinking fewer carbonated drinks which could represent a promising future for fruit juices. Mintel's research reveals seventy three percent of the respondents agreed that a juice's nutritional value is the most important characteristic when deciding which fruit juice to purchase. In fact, sixty one percent of the consumers stated that they would buy only juices which are a 100% juice (Mintel International Group).

In the U.S., fruit juice can only legally be used to describe a product which is 100% fruit juice. A blend of fruit juice with other ingredients is called a juice cocktail or juice drink (Code

of Federal Regulations, 2001). According to the Food and Drug Administration (FDA), a diluted juice which includes fruit juice or puree, water, and which may contain artificial sweeteners is called nectar (CESAN, 2003).

In develop countries where the demand for convenience products is growing, packaged food products account for large shares of total food expenditures among consumers (ERS, 2009). The U.S. market is divided into the at home and the away from home food and beverage market. In 2008 the average annual expenditure of consumer for food away from home was $2,698 (Bureau of Labor and Statistics, 2008). In 1970, 26 percent of all food spending was on food away from home; by 2008, that share percentage increase to 48.5 percent representing $565 billion (ERS, 2009). Some factors that have contributed to this increase are women working outside the home, and the smaller size of U.S. households (ERS, 2005). According to the National Restaurant Association (2008), U.S. adults purchase a restaurant snack or meal 5.8 times per week.

Agriculture has a important role in sustainability, sustainable food has been described by The American Public Health Association (APHA) as a move that provides healthy food that meets consumers needs while maintaining healthy ecosystems, with minimal damaging to the environment (Feenstra, 2002; Harmon and Gerald, 2007). The sustainable food movement encourages organic and local production. A study conducted by the USDA (2009) indicated that U.S. sales of organic food have grown from $1 billion in 1990 to $21.1 billion in 2008, accounting for 3.7 percent U.S. food sales.

With an increasing emphasis on health, nutrition and environment, changing life styles and higher incomes, the U.S. market offers several opportunities for new products. Today's trends for healthy eating habits and "ready to eat" products has increased consumer demand for

more detailed and accessible information, primarily on food packaging and labels. Consumers like to know the ingredients and the features related to food safety (Abbott, 1997). Although product attributes such as quality and price are extremely important to consumers, packaging and labeling play a fundamental role on consumer's intention to purchase. These factors are important because they represent the first line of contact between the consumer and the product.

2. Problem Statement

Today the majority of fruit juice products target children; however there is a need for a nutritional drink for the adult. The purpose of this study is to develop a better understanding of consumer preferences for 100% fruit juice packages and labels. Specifically, to evaluate which types of packaging and labeling will be more convenient and attractive to the adult market (who usually spends more of its time away from home) in terms of the attributes influencing consumer's intention to purchase as well as the factors that affect these preferences.

3. Specific Objectives

(1) to investigate which packaging and labeling attributes U.S. consumers consider important when choosing 100% fruit juice products,

(2) to estimate consumer's willingness-to-pay for selected packaging and labeling attributes, and

(3) to identify market segments based on consumers preferences, behavior, attitudes, interests and beliefs, and analyzed differences between the segments.

4. Organization of the Study

The study in this thesis use hypothetical fruit juices that are not available in the market. Fruit juices were chosen because it has been shown that nutrients in these products help prevent the risk of several diseases such as certain types of cancers and heart disease. Five attributes were included to measure their relative importance: packaging material, health and nutritional

claims, an organic symbol, a locally produced symbol, and price. The experimental design was conducted to assign attributes in different choice sets. Data was collected from approximately 253 households in the U.S. through a web survey. A conditional logit (CL) model for the entire sample, and CL for different subgroups were then applied to analyze consumer preferences and willingness to pay. The next chapter focuses on the literature review. Follow by methodology, which include the theoretical and empirical models, data collection process and the analysis procedures. Chapter V describes the results and discussion. The last chapter concludes with the conclusions, limitations, and suggestions for future research.

CHAPTER II. LITERATURE REVIEW

1. Trade-offs Among Product Attributes

Today there is an increasing demand for healthy and nutritional products as a consequence of consumers being better educated and more demanding; which leads to a need for new products and a more differentiated food product assortment (Linnerman et al., 1999). In fact, consumers want high quality products that also deliver specific benefits in terms of health, safety and environmental quality (Van der Heuvel et al., 2007).

How consumers perceive product attributes is a critical aspect in the food choice process (Kupiec and Revell, 2001). Several studies have been conducted to examine how consumers evaluate different product attributes in numerous food products. Health, nutrition, taste, price, convenience are some of the criteria consumers use to determine which product is more attractive (Bech-Larsem et al., 1999). Consumers face many trade-offs in their food choices, for example between nutrition and price, nutrition and convenience (Blaylock et al., 1999).

The development of healthy food was rated as the most important area of research, followed by developing natural foods (Katz, 2000). According to Baltas (2001), consumers give plenty of attention to their diets, and especially to the information that appears on the package label such as, nutritional and health claims. As a response to consumers demand for healthier and nutritious goods, producers should highlight these claims on the front label of their packages. Other characteristics such as organic production and locally produced might provide additional benefits to consumers who care about environmental preservation.

The sensory attraction of a food product and the visual appearance of its packaging are powerful influences on consumer acceptability (Tuorila and Pangborn, 1988; Cardello, 1994). Packaging attributes can persuade consumers to purchase the product, and sensory attributes will

confirm if they like it. This process may be determined if the buyer will repeat the purchase (Munrray and Delahunty, 2000). Packages and labels have only a few seconds to make an impact on the consumer's mind (Dantas et al., 2004); during that time, it must catch the consumer's eye, and convince the shopper that it is the optimum option on the shelf (Rowan, 2000).

Color and graphics in fruit juice packages represent key elements of the total appearance in a package design. According to Hutchings (2003), intensifying the fruit colors could strengthen expectation for the juice flavor. Deliza (2003) suggested that package designers should consider consumer expectations about the product's sensory attributes when designing the labels.

In order to reach consumers needs and be successful in the market, producers should try to understand the sensory and packaging characteristics of a food product (Munrray and Delahunty, 2000). Consumers usually don't choose the attributes one at a time, instead they choose the group of attributes that provide them the greatest utility.

Some literature has been devoted to consumer perception of labeling and packaging, and the role of information on consumer intention to purchase. For instance, in Roe, Levy and Derby (1999) study, nutritional and health claims presented on the front label were more important than back-label nutrition facts. Bond, Thilmany, Keeling (2007), noticed that health claims regarding a diet rich in fruits and vegetables, and the power of these products reducing the risk of coronary disease and cancer, proved to be the most effective claim when attracting consumers. Teisl, Bockstael, and Levy (2001) examined the effects of nutritional claims on front label for several grocery products, and determined that these claims tent to change consumer's behavior; however, they stated that the health alternative did not always increase market share.

In a survey conducted by Cichon and Ucherek (1999), three hundred and eighty students

were asked which packaging attributes influence their choices when deciding which fruit juice to purchase. Results showed that functionality, shape, capacity, general look and ecological aspect were the most important attributes that determined consumer choice of packaging.

Deliza et al. (2003), conducted a conjoint survey with one hundred and twenty five British consumers, to observe the expectations of packages of an unfamiliar fruit juice (passion fruit) using computer generated images. The respondents were presented with twenty four computer generated package images, on which six packaging factors were manipulated (background color, picture, information, brand, language and shape). According to the authors, significant effects were found for each attribute; however, background color and information were the most important.

More recently, Laboissiere et al. (2007), employed conjoint analysis to determine the effect of packaging attributes on consumer expected liking and purchase intention of passion fruit juice. One hundred and twenty consumers evaluated twelve prototypes for expected liking and purchase intention. The results suggested that information about benefits of processing technologies such as high hydrostatic pressure presented on the package played an important role on consumer intention to purchase.

Deliza and Silva (2003), explored consumers perceptions about the information of high pressure in the fruit juice package using focus groups. Dantas et al. (2004) also used focus groups to obtain information on consumer's attitudes about minimally processed products. Results suggest that the main packaging characteristics observed by participants were "best before", brand and nutritional information. The results of these studies implied that giving consumer's information about food production had a positive impact on the perception.

A similar approach conducted by Cardello, Schutz and Lesher (2007), addressed issues

related to consumer attitudes and conceptions regarding food processed by emerging technologies. He found that the perceived risk associated with this technology was the most important factor influencing consumer interest in their use.

The choice of the product can be heavily influence by the packaging material. Beverage packages are of particular interest, since they cannot be distributed without a container (Van Dam and Van Trijp, 1993). Since their creation in 1960, aluminum cans rank as today's most desirable, convenient, and environmentally friendly package. According to the Can Manufacturers Institute in the U.S. approximately 130 billion cans are used by Americans each year, creating an eight billion dollar industry, with 200 manufacturing plants in 38 states, which employ more than 35 thousand employees. Tetra-brick was created in 1950. According to a Global Marketing Information Data Base (GMID) in 2005, approximately 1.9 billion of tetra-packs were used for fruit and vegetable uses in the United Kingdom. Polyethylene Terephthalate (PET) was introduced in the market in 1970, and since then has been increasing its popularity among the beverage industry. In 2005, approximately 68 billion of units of PET bottles were used for beverage in the U.S., and this number is expected to grow by 87 billion in 2010 (GMID, 2006).

A number of studies have examined consumer preferences for organic products (Loureiro et. al, 2001; Loureiro and Hine, 2002; Gil et al., 2000), most findings suggest that consumers are willing to pay a premium for organic products.

The term "Locally produced" is gaining increasing importance in a variety of fields. Local food is produced and processed locally, and it is determined by the distance it has traveled. One factor that influence consumers consumption of local products is that this type of food is environmentally friendly (Lusk et al. 2007), because supermarkets are using less fuel to transport

the food, and less preservatives to extend the shelf life.

People who prefer to eat local foods are sometimes called "locavores" or "localvores" (Roosevelt, 2006). Locavore is someone who eats food grown or produced locally or within a certain radius such as 50, 100, or 150 miles. This movement was created by Jessica Prentice from San Francisco, and promotes the practice of eating from food produced within an area of a 100 mile radius.

The literature review suggests that determining which packaging and labeling attributes are most significant to the consumer is essential before launching a product. In the case of 100% fruit juices, packaging and labeling can predispose the consumer to buy the product. Features such as package and nutritional claims play a fundamental role on the purchasing decision. Information about the content and benefits for the consumer should be highlighted on the package. In order to get an advantage in this competitive market, producers should try to involve consumers in the creation of the products before actually introducing it into the market. Several studies have been carried out regarding package and label of fruit juice; however, few have examined the effect of lifestyle segmentation which incorporates consumer behavior and opinions about 100% fruit juices packages, to identified homogeneous consumer segments sharing similar patterns of social behavior.

2. Willingness to Pay

Willingness to pay is the maximum price that someone is willing to pay to acquire a good or service. The most widely used techniques to obtain willingness to pay estimates are conjoint analysis, contingent valuation, and experimental auctions. Conjoint analysis and contingent valuation are hypothetical valuation methods, and use survey responses to obtain consumers' willingness to pay. Experimental auctions can also be used to determine how much consumers

will pay for a good or service; however, this technique is expensive, since it consist of respondent's interaction with real goods, and using actual money.

3. Conjoint Analysis

Conjoint analysis is a multivariate technique developed specially to understand how consumers develop preferences for different products or services. It is widely used in marketing research because it allows estimating consumer's preferences of a product by combining part worth utilities for each attribute.

In a conjoint experiment the researcher constructs a set of hypothetical products by combining selected levels of each attribute, these combinations result in the design of the stimuli which is presented to the respondents. Consumers will provide their evaluations on the basis of the behavior of interest, known as the choice task (Cardello et al., 2007).

Approximately sixty percent of all conjoint studies are related to consumer goods (Cattin and Wittink, 1982). Applications of conjoint analysis are used primarily for new product or concept evaluation, pricing decisions, market segmentation, advertising, and distribution.

Numerous studies have used conjoint analysis to examine buyer or user preferences for new food products or technology. Harrison, Stringer and Prinyawiwatkul (2000), used conjoint analysis to analyze preferences for three consumer-ready products derived from catfish. Again, in (2004) Harrison and Mclennon used conjoint analysis to measure the preferences of U.S. consumers for labeling of biotech food. Deliza et al. (2000), applied conjoint analysis to study the effect of consumer expectations on the evaluation of instant coffee, and in (2003) used it to investigate consumer expectations using computer generated images of packages of an unfamiliar fruit juice (passion fruit). Sethuraman et al. (2005) worked with conjoint analysis to

11

identify which product attributes consumers prefer for a new generation of wireless telephone handsets.

More recently, Cardello et al. (2007) conducted a conjoint study with military troops and civilians to examine the importance of a variety of factors that may encourage the utilization of products with innovate and emergent technologies. Laboissiere et al. (2007) also employed conjoint analysis to determine the effect of packaging attributes on purchase intentions toward passion fruit juice.

There are three steps involved in a conjoint study. The first step involves defining the product attributes and their levels. Typically, a conjoint study involves six or seven attributes. Once the attributes and levels are identified, it is necessary to define a set of hypothetical products that can be presented in different forms such as descriptive form, pictorial form or a prototype (Vriens et al, 1998). Second, an experimental design and a choice of data collection method should be constructed; followed by the selection of measuring scale for the dependent variable and the estimation method for analysis of the data. Participants then are asked to evaluate their overall preference for the hypothetical product. The last step involves selecting the empirical model and estimating the buyer's part-worth utilities (Harrison et al., 1998).

a. Selection of Product Attributes and Levels

Attributes in conjoint experiments should reflect the competitive environment of alternatives available in the market (Blamey et al, 2001). In most situations consumers know which attributes are more important when they look to purchase a product. Consumer perceptions of a product are based on more than one attribute, so it is fundamental to identify which attributes influence their intention to purchase.

A series of focus groups and other qualitative technique could be used to obtain

information about the attributes and levels. Focus groups are particularly useful with new product concepts. A focus group session is a qualitative research tool designed to obtain perceptions of several individuals of a specific subject, and is frequently used in conjoint analysis studies. Focus groups interviews can be described as small groups in which the researcher guides a group discussion on the topic of interest (Harrison et al., 1998).

Deliza et al. (1999) used focus groups to find out which fruit juice package attributes Brazilian consumers prefer. In (2003) she used this information to created images of passion fruit juices packages in a conjoint study. Deliza et al. (2000), used focus groups to figure out which features of label affect the expected attributes of instant coffee.

Dantas et al. (2004), employed focus groups to obtain information on consumer attitudes and opinions about the package attributes when choosing minimally processed vegetables to figure what kind of information should be presented to contribute to a higher intention to purchase. Harrison and Mclennon (2004) used focus groups to obtain information regarding the consumer's general knowledge about biotechnology, and identify labeling attributes that contribute to the consumers' preference.

b. Experimental Design

There are three conjoint methodologies: traditional, adaptive and choice-based. The researcher selects the best methodology based on the number of attributes, level of analysis, the choice task (selection of the stimulus), and the formulation of the model. A traditional conjoint analysis is characterized by having nine or less attributes, it is known as a full profile (Hair et al., 2006). The adaptive conjoint method can accommodate up to thirty attributes, and requires computer-based interviews. The last methodology is the choice based method. The number of attributes this approach can accommodate is six or less. Respondents are provided alternative

products and asked to choose which of the products they would purchase, given the attributes and descriptions of the competing products (Lusk and Hudson, 2004).

i. Model Form: Composition Rule

A composition rule describes how respondents join part worth values to form total utility. The most common composition rules are the additive model and interactive model (Hair et al., 2006). In the additive model respondents add up values of the part-worth utilities of each level of the attributes presented on the stimulus, to reach total utility. For example, a fruit juice has two attributes with two respective levels, flavor (grape and orange), and price ($1.20 and $1.60). Let suppose the part-worth utilities of each level are (1 and 2) for the flavors and (3 and 5) for the prices. We can calculate the total utility of four possible stimuli, see table 1.

Table 1. Additive Model.

Stimulus	Levels Defining Stimulus	Part-Worth	Total Utility
1	Orange and $1.20	2 + 3	5
2	Orange and $1.60	2 + 5	7
3	Grape and $1.20	1 + 3	4
4	Grape and $1.60	1 + 5	6

In the interactive model the consumer sums the part-worths to get an overall total across the set of attributes. However, it allows for some combinations of levels to be more than just their sum. The respondent choice task and the estimation procedure is more complicate than the additive model.

ii. Relationships Between Part-Worth Estimates

There are three types of relationships between the part-worth and the factors. The linear model is the most restricted form, because the researcher can only estimate a single part-worth.

The quadratic form has a curvilinear relationship, see figure 2. The last one is the separate part-worth form, which allows to separates estimates of each level. In this relationship the number of parameters is equal the number of levels.

| Linear | Quadratic | Part-Worth |
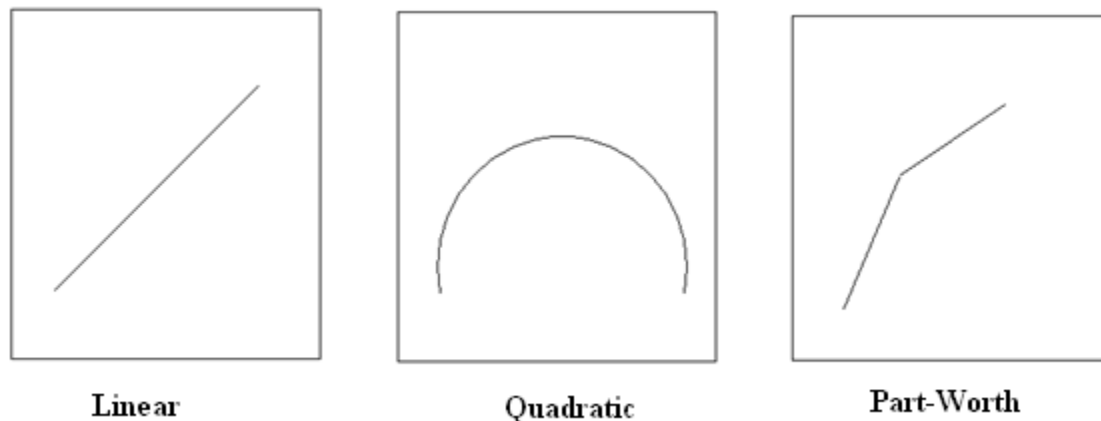
Figure 2. Types of Relationships between Factor Levels in Conjoint Analysis

iii.   Presentation Method

There are four presentation methods in a conjoint study. These include the trade off, the full profile, the pairwise and the choised based. The trade off method compares two attributes at a time, respondents rank all the levels, and all possible combinations of attributes. It is simple for respondents, and easy to administer. It is recommended when the number of factors ranges from seven to ten (Hair et al., 2006).

The full profile method is the most common, because the researcher can reduce the number of comparisons through the use of fractional factorial designs (Hair et al., 2006). The fractional factorial design uses only a subset of the possible stimuli. Its primary objective is to reduce the number of evaluations collected. Each stimulus is describe separately, often using a profile card and the results can be either ranked or rated. It is recommended when the number of factors is six or fewer. The full profile means, the evaluation of all profiles at one time, where an ordering of most preferred to least preferred is required.

15

The pairwise method is a comparison of two profiles using a rating scale to indicate preferences for one profile over the other. Usually, it does not contain all the attributes. It is also possible to reduce the number of pair's comparison employing cyclical designs.

In the choised based technique the researcher determines the number of alternatives per choice set. Alternatives are typically limited to two to four per choice set. The inclusion of an opt-out, or "neither," option is also common. This serves as the base and is available to all respondents.

c. Data Collection

The internet has become an important and effective tool for administering consumer's surveys. It is estimated that research applications for new products, such as, conjoint analysis, present the highest percentage of returns in all types of online research (conjoint analysis, present the highest percentage of returns in all types of online research (American Demographics, 2001). s, 2001). According to Sethuraman et al. (2005), Internet-based conjoint analysis accounts for forty to fifty percent of all conjoint analysis applications. Recent studies of conjoint analysis have used the potential of the Internet, by employing pictorial descriptions of attributes instead of written descriptions (Dahan and Hauser, 2002). Vriens et al (1998), reports that a visual image of attributes improved respondents understanding for the design of each attribute. Additionally, Dahan and Srivivasan (2000) state, that visual improvement of images can be obtained easier with Internet/Web-enable technology than with traditional paper and pencil questionnaires.

The use of internet surveys has simplified the conjoint task demands on the respondents and made the administration of full-profile designs feasible (Orme and Huber 2000; Witt and Bernstein, 1992). Recent research even demonstrated the reliability and validity of full profile conjoint when administered over the Internet (Orme and King, 1998). For instance, Sethuraman,

16

Kerin and Cron (2005) compared online and offline data collection methods for identifying preferences in product attributes. Their analysis indicated that web based respondents tended to focus on more attributes when making choice decisions than mail surveys. Preferences were higher for attributes presented with visual images when data was collected in a computer environment than when it was collected with paper and pencil.

Some of the advantages of using internet for conducting surveys over other techniques are that it provides access to individuals world-wide, they are usually cheaper than paper surveys, more people are web savvy, and it is easier and faster to send the questionnaires and to collect the data. Disadvantages include sampling, and access. One way to avoid this type of situation is with response tracking. In order to submit a survey, respondents must enter their email address, or in the case of communities asking the respondents to register in order to participate in discussions could solve this problem. Another way to increase response rate is to offer some type of incentive. Access is also a disadvantage since not everyone use the internet; although, today the percentage of people using it is increasing.

There are several options for collecting data on the web. First, to create the questionnaire there are numerous sites on the web that offer software packages. These computer programs help the researcher in the creation of the questionnaire and administration of the survey. They offer different templates, a variety of question types, multimedia can be included, and randomized answer choices for the respondents. They usually present tutorials to assist the researcher in developing the online questionnaire. Some even support different language versions of the online survey.

Some other features include tracking of survey respond email, who has not taken the survey, and who has started but not completed. These features enable the administrator to send

17

reminders to only those who have not finished the survey. They also offer the ability to export survey responses to statistical software packages such as SAS and SPSS, and give the researcher several tools for analysis and interpretation. Costs range from a free month of trial of a simple package to a $900 premium package per year.

After creating the survey online, the researcher has several options for distributing the instrument. The survey can be sent via email to the researcher email list, it can be posted on a web-page or community, also the researcher can purchase an email list from several companies, and another option is purchasing a panel list.

An online survey panel is a group of people who are compensated to take surveys regularly. These panel providers maintain profiles on survey subjects, and can match subjects to surveys that fit the desire demographic profile. The costs per response increase as the requirements become more specific. Even though, purchasing a survey panel can be expensive, the process is faster and less expensive than post-mail survey.

d. Selection Measuring Scale

The most common methods for coding consumer preferences in conjoint analysis are rank order, interval rating scales, and discrete choice (Harrison, Gillespie and Fields, 2001). Rank order requires that respondents rank all hypothetical products or profiles; it provides a non-metric ordering of respondent preferences. Some of the advantages of using rank order are that it is more reliable, because respondents are only required to say which alternative is preferred over another (Green and Srinivasan, 1978). Another advantage is that it provides more flexibility in estimating different types of composition rules. However, some disadvantages of using rank order include the inability of respondents to communicate indifferences between stimulus cards, and the difficulty when the number of product profiles is large. In these cases the dependent

variable is ordinal, order regression models such as ordered probit, logit (Harrison et. al, 2005), and MONANOVA (KrusKal, 1965; Johnson, 1991) are more appropriate for conjoint analysis.

The rating technique allows respondents to express order across product choices, allowing both metric and non metric properties of utility to be obtained (Harrison et al., 2005). When analyzing rating preferences in conjoint analysis, the dependent variable is usually limited and censored on both ends. Rating measure is easy to analyze and administer, it allows to perform a multivariate regression; however, since respondents could indicate their preferences for several hypothetical products, it can result in two or more products receiving the same score. Most conjoint studies used ordered regression models such as ordered probit and two-limit Tobit to measure respondent rating values for product profiles. Empirical studies have found that there is no significant difference in part-worth estimates between the two models; only in the cases where the degrees of freedom are constrained, the two limit tobit is likely to be the best option since it requires less degrees of freedom (Harrison et al., 2005).

In a choice-based analysis, respondents are asked to choose their preferred alternative of hypothetical products, and are allowed to choose only one option. A choised-based approach requires a conditional logit, multinomial logit, or nested logit model to analyze discrete choice variables. It is assumed that the respondent will select the alternative that produces the highest amount of utility. Several researchers have found the choice-based method to be a superior technique compared to the ranking or rating practices (Pinnell, 1994). Some disadvantages of using this technique are the lower number of attributes that can be included, and the lack of individual data to estimate part worth utilities. Using techniques such as Hierarchical Bayesian Analysis, and interaction terms, seeks to remedy this situation.

Some advantages of using choice based are the ability to measure multiple attributes simultaneously and the ability to imitate a real market situation, where individuals are presented with the choice of purchasing one product over the other, or neither (Adamowicz et al., 1998; Lusk and Schroeder, 2004). Even though, the ranking or rating methods allow more than one response per consumer, the reliability of the information is questionable in certain situations. For example some options would never be chosen in a real market situation, by choosing an opt-out response, respondents must decide if they will or will not buy certain products, which makes the choice task more realistic.

e. Empirical Model

The conditional logit (CL), multinomial logit (ML), and nested logit (NL) models are the most common tools used to analyze discrete choice variables. The ML and the CL models are very similar; however, the ML uses individual-specific explanatory variables, whereas the CL model focuses on the alternative-specific characteristics of each choice and uses these as explanatory variables. For example, in a model that predicts the probabilities of a person choosing which fruit juice to buy, the multinomial logit uses the characteristics of the chooser (such as age, gender, income) to predict the fruit juice choice. On the other hand, the CL uses characteristics of the alternatives (such as nutritional information, material of the package) to predict the fruit juice choice.

Some disadvantages of using these models are that they do not accommodate preference heterogeneity among consumers, this means that the coefficients of the variables in the models are assumed to be same for all respondents. These models are based on the assumption of independence irrelevant alternative (IIA), which implies that the probability ratio of an individual choosing between two alternatives does not depend on the existence of other

alternatives or attributes (Louviere et. al, 2000). This means that the ratio of probabilities of choosing a tetra-pack and the probability of choosing a can is not affected by the absence or presence of a PET bottle. These characteristics allow the analyst to add new alternatives without having to re-estimate the model.

The IIA relies on the assumption that the error of the model is independently distributed across alternatives. This assumption is very restrictive, especially when the number of alternatives in the choice set is larger. If the assumption of IIA is not met alternative models that do not assume that the error is independently distributed across alternatives are recommended (Louviere et. al, 2000). Alternative models have been developed to relax this assumption, including the nested logit, mixed logit, multinomial probit, and heteroscedastic extreme value models. However, these models are more complex than the multinomial and conditional logit, making them more difficult to estimate, and requiring large number of observations and time.

Train (2003) suggests that results of a conditional logit can often be used as general approximation of the model that relaxes the IIA. If the researcher is interested in determining individual preferences, violating the IIA may not be an issue and it is not necessary to use alternative models. However, when the goal of the research is to forecast the demand for choosing one alternative cause by a change in some of the attribute it becomes a serious problem and other models should be used to analyze the data.

4. Market Segmentation

It is important to understand how consumers perceive a product, how they make choices and how they construct purchasing intentions. Consumer decisions about food choices are the result of a complex relationship between personal preferences, socio demographics, psychosocial, and environmental factors (Trudeau et al., 1998). With an ample range of brands in

the market, it is vital to identify the target audience before launching a product. It will be easier

to select which information to include on the label, if the researcher anticipates the target market.

Market segmentation is widely practiced in marketing research (Wedel & Kamakura, 2000). It is

used to differentiate a target population by segments of consumers with shared needs, lifestyles,

values and behavior.

The first step of market segmentation is to identify which variables are necessary to use

in order to group customers. Often, researchers use more than one variable to construct a

comprehensive description of the segments. The most common variables used are demographic,

geographic, psychographic, and behavioral.

Demographic segmentation is perhaps the most commonly used and easy to collect. It has

been widely described in the literature that demographic characteristics is an important factor to

determine fruit intake (Turrell et. al, 2002). However, they are useful only when they are

correlated with the relevant objective function, such as purchase behavior or brand preference

(Matsuno, 1998).

The main purpose of psychographic segmentation is based on attitude, lifestyle, and

values. Lifestyle segmentation has been used for several marketing and advertising purposes

(Wells and Tigers, 1977). The most widely used measures of lifestyle segmentation are Rotech's

value survey, List of Values (LOV), Values and life Style (VALS2), and Activities, Interest, and

Opinions (AIO).

Many studies had emphasized the relationship between beliefs, attitudes, motivations,

past behavior and product familiarity regarding a healthy diet with fruit intake (Kearney et al.,

2000; Kvaakik et al., 2005). Situational factors, such as moment and place of purchase, may also

influence a consumer's intention to purchase fruits and vegetables (Meiselman, 1996; Grunert,

2006).These measures are called behavioral segmentation, and are based on what consumers actually do, their knowledge of particular products, their uses of products, and their responses to certain products. Some examples of type of segmentation are user status, usage rate, loyalty status, benefits, and media habits.

One of the most common scale response format questions in today surveys is the Likert scale. It was developed by Rensis Likert in 1932. The Likert scale can be four-point, five-point, six-point, and so on. The even-numbered scale usually forces a respondent to choose while the odd-numbered scale provides an option for indecision or neutrality. The most common scale is 1 to 5. Often the scale will be 1=strongly disagree, 2=disagree, 3=not sure, 4=agree, and 5=strongly agree.

In a study conducted by Dawes (2008), he founds that compared to a ten point scale, a five or seven point scales produce higher mean scores relative to the highest possible attainable score, and this difference was statistically significant.

There should be at least four or five times as many observations as there are variables (Malhotra, 2009). Once you define the problem and identify the variables needed for your research, the next step is to run a factor analysis to reduce the number of variables in common factors. Factor analysis is a statistical technique used to analyze relationships among variables. For a factor analysis to be appropriate, the variables must be correlated. Several tests that can be administrate to examine if the factor analysis model is appropriate. The Bartlett's test is one option, a large value of the test will indicate the rejection of the null hypothesis which said that the variables are uncorrelated. Another test is the Kaiser-Meyer-Olkin (KMO), this statistical test compares the magnitudes of the observed correlation coefficients with the magnitudes of the

partial correlation coefficients, a value greater than 0.5 means that the model is appropriate (Malhotra, 2009).

As soon as the correlation matrix is selected, it is necessary to define the method of factor analysis. There are two methods, principal component analysis and common factor analysis. In principal component analysis the total variance of the sample is considered. This technique is recommended when the goal is to determine the minimum number of factors. In common factor analysis, all the factors are estimated based on a common variance. This technique is appropriate when the primary objective is to identify the dimensions and the common variance of interest (Malhotra, 2009).

To determine the number of factors there are several procedures: a priori determination, determination based on the eigenvalues (only factors with a variance greater than one should be included), based on scree plot of the eigenvalues against the number of factors, based on the percentage of variance (cumulative percentage should be at least 60%), based on split-half reliability, and based on significance test (Malhotra, 2009).

Once the number of factors is determined, it is necessary to rotate the factors in order to interpret and label each one. The most common method of rotation is the varimax procedure, which minimize the number of variables with high loadings on a factor. By identifying which variables have high loadings on the same factor we can label each factor.

After defining the factors that are going to be used in the study, it is necessary to define the segmentation technique. The purpose of the segmentation is to link consumer characteristics with their preference for the packaging and labeling attributes. There are several methods to define segments. Cluster analysis and median split are just some of the many procedures that can be used.

When conducting a cluster analysis, the first step is to define the variables on which the clustering will be based. The second step involves selecting an appropriate distance measure which is going to determine how similar or not the objects being clustered are. The most common measure is the Euclidean distance, which is the squared root of the sum of the squared differences in the values for each variable (Malhotra, 2009). The third step is selecting the cluster procedure. Clustering procedures can be hierarchical and nonhierarchical. The hierarchical is the most common procedure, and can be agglomerative or divisive. The divisive method starts with all respondents in one group, then it divide each respondent in a separate cluster. In the agglomerative method each respondent starts in a separate cluster. This last technique is very common in marketing research, and consist of linkage (single, complete, average), and variance (Wards, centroid) methods. The variance method seeks to generate clusters to minimize the within-cluster variance. In the Wards procedure, the means of the variables in each cluster are computed, and for each object the squared Euclidean distance is calculated. The distances are summed for all objects and at each stage, the two clusters with the smallest increase in the overall sum of squares within cluster distance are combined (Malhotra, 2009).

Once the cluster procedure is defined, it is necessary to select the number of clusters require for study. In a hierarchical clustering, the distances between clusters can be used as criteria to select the number of clusters with the agglomeration schedule (in the column of coefficients, look for large increases between stages), another technique is using a dendogram. After selecting the number of clusters it is necessary to interpret each one, this task can be done by examining the cluster centroides. The centroides are the mean values of the objects contained in the cluster on each variable. The researcher needs to look for high values in each cluster.

When using the median split technique, individuals can be classified as either high or low by splitting the sample at the median of the scale. In previous studies median split have been used to divide the sample into segments based on behavior and lifestyle scales (Sanders et al., 2002; Rose et al., 1996; Haugtved et al., 1992; Kamakura and Novak, 1992; Lassiter et al., 1991; Beatty et al., 1985; Peter and Ryan, 1976).

CHAPTER III. MATERIALS AND METHODS

Conjoint analysis was selected for use in this study. This practice has consistently been used in determining consumers' willingness-to-pay for products that represent particular characteristics or groups of characteristics (Hair et al., 2006). It was selected because of the ability to derive willingness to pay estimates for a bundle of attributes, rather than just a single attribute, also because it mimics the typical shopping experience, and has a low cost.

1. Selection of Product Attributes and Levels

The objective of this study was to analyze the role of labeling and packaging on consumer's choices for fruit juice. The first step in a conjoint study is to determine the attributes and levels. Price was required as part of the experiment to determine willingness to pay. Current market prices for fruit juice available in the market were used to determine the levels. The attributes used in this study were determined based on literature review, results from previous focus groups of similar studies where they look for nutritional information, and by examining existing fruit juice products in the market. We compared different products from the most competitive brands, and identified attributes that were the focus of the research in order to include realistic attributes of label information and packaging material.

The most important attributes to consumer choice were packaging material, health and nutritional claims, if the product has organic ingredients or not, and if it was locally produced. The levels of each attribute are described in table 2.

For packaging material, we choose aluminum cans because it is the most common material in the U.S., because its convenient, and environmentally friendly package. We also selected Polyethylene Terephthalate (PET) bottle because the popularity of this material has increased among the beverage industry. The tetra-pack material is not a very popular in the U.S., but its

27

international success makes it important to consider in the study.

Table 2. Attributes and Levels.

Attributes	Levels
Packaging Material	Can **(Base)** Tetra-pack Polyethylene Terephthalate (PET) bottles
Health and Nutritional Claims	No information **(Base)** Vitamin C No Sugar Added Nutritional Index
Organic	Organic Logo No Logo **(Base)**
Locally Produced	Locally Produced logo No Logo **(Base)**
Price	$0.80 (Base price) $1.20 (50% above the base price) $1.60 (100% above the base price)

We vary three general marketing claims related to nutritional aspects of the product, a claim regarding Vitamin C content (100% Vitamin C), which means this product contains 100% of the recommended daily intake of vitamin C. A claim regarding sugar content (No Sugar Added) means that no extra sugar was added. A nutritional index (Overall Nutritional Index) is a nutritional rating system which converts nutritional information into a single score on a scale of 1-100. The higher the value, the more nutritious the product is. It attempts to simplify food choices. We also included a "no claim" option in the nutritional claims.

A nutritional index is a technique of ranking or rating food products to communicate to consumers the nutritional value of a food in a simplified way, or to rate specific food attributes such as cholesterol or sugar content. They are usually developed by governments, nonprofit organizations, or private companies. The difference between this type of nutritional information and the usual nutritional labeling is that they attempt to simplify food choices, rather than listing specific amounts of nutrients or ingredients. One similar systems used in the past was Pepsi Co's

Smart Choices Program. Some of the systems currently used are Glycemic index, Guiding Stars, Nutripoints, Nuval, and Points Food System.

In this study we compared fruit juices that were organic and locally produced. Consumer attitudes toward the environment is changing, today people care more about environment than in the past. The demand for environmentally friendly products has increased substantially in recent years. Our goal was to measure how much consumers are willing to pay for this type of product. Although a number of studies have examined the demand for organic claims, the literature on consumer preferences for locally produced products is limited.

Three price levels were included in the analysis, corresponding to actual prices observed for fruit juices in Louisiana retail groceries stores. Price was entered as a continuous variable. The rest of the attributes were dummy code, with a base level of "can" for the packaging material, "no information" for the health and nutritional claims, and "no logo" for the organic and locally produced.

2. Experimental Design

With five attributes associated with (3 x 4 x 2 x 2 x 3) levels respectively, there were 144 possible product combinations. Because the complexity associated with a larger number of choice sets in the design could affect respondent decisions, we minimized the number of choices using an orthogonal fractional factorial design. The software Designer was used to formulate 16 orthogonal attribute combinations, and 2 additional combinations for validation.

Eighteen fruit juice products were created based on an actual commercial grape fruit juice using Adobe Photoshop CS4. We manipulated five factors (material of package, nutritional and health claims, organic logos, locally produced symbol and price). The choice sets were presented using graphics in an attempt to mimic a real purchasing experience. The brand was omitted from

29

the product, and the word "GRAPE" was placed instead so the respondents wouldn't be influenced in their decision. We used grape juice for the survey in order to use the same label, rather than have different labels and colors that could distort the focus of the study. All the containers have the same content amount (12 oz.).

The 16 alternatives were randomly ordered to create eight pairs of alternatives. A total of 8 choice sets were selected for estimation. Because only the differences in attributes levels matter in logit models, the random order alternatives have the maximum differences with the original alternatives (Louviere, Hensher, and Swait, 2000). For validation, an additional choice set was added to the design, to assess the ability of the model to predict choices.

The respondent would be presented with three alternatives, two alternatives refer to product profiles with varying label claims and package, and the third option refers to an opt-out alternative, which states "I would not buy either product to the left". These 8 choice sets were randomly assigned into two versions. Each version has four choice sets for estimation and one additional for validation.

Every respondent received either one of the two versions. The choice modeling literature recommends at least 500 choices to allow for valid maximum likelihood estimations (Long, 1997). Therefore, 253 respondents evaluating 4 choices result in 1012 choices for analysis, a double of the minimum required for valid maximum likelihood.

The response variable, whether or not an alternative is chosen is coded with 1 when chosen, and 0 otherwise. There are three alternatives for each choice task. For each of the product attributes categories, one of the attributes levels is omitted and the others are assigned a value of 1 if chosen, and 0 otherwise.

An alternative-specific constant (ASC) "c" was created to represent the "neither option"

(option C). This was coded as 1 if the respondents choose the "neither" alternative, and 0 if they choose one of the product alternatives.

The choice design was pre-tested with 37 graduate students and faculty of the Department of Agriculture Economics of Louisiana State University. Results suggest that respondents were able to understand and follow the instructions, and complete the choice tasks. The final version of the choice set design is shown in appendix A.

3. Data Collection

From April 27-29 of 2010, Clear Voice Research (CVR), an online market research company, sent the survey to 4000 U.S. residents. To ensure their panel remains of high quality, CVR set up a number of tactics both within their panel management technology and directly with their partners. Their panel management software automatically audits all profile data of each individual, each suspect case is then quarantined and reviewed manually, and appropriate action taken. They screen for inconsistencies such as male respondents claiming female ailments, IP address mismatch on geo location in profile, unverified address, first name and last name match, and other data points that may indicate potential fraud.

There were two versions of the questionnaire sent out; the only differences between the versions were the four stated choice questions. The validation question was the same for all respondents. The questionnaire contained four sections see appendix E. The first section includes questions regarding fruit juice consumption. The second section involves a series of variables regarding consumer psychographics lifestyles, attitudes, and behaviors. The third section examines the conjoint hypothetical profiles, and the last section contains the socioeconomic and demographic variables. Only 128 respondents complete the first version of the questionnaire and 125 respondents complete the second version.

31

4. Empirical Model

A conditional logit (CL) model was used to analyze the data in the choice-based section of the questionnaire. The conditional logit model assumes independent and identically distributed (i.i.d.) error terms with a Type I extreme value distribution. The main purpose of this study was determining the importance of the chosen attributes, and the willingness-to-pay for those attributes. The CL model allowed the estimation of both interests.

Because researchers don't have all the information regarding some of the characteristics that make up the decision process, the random utility model split the total utility in two parts. The first is a deterministic component of utility function based on product attributes j (V_{ij}), and the second is a stochastic, or random, unobserved error component (ε_{ij}) (Louviere et al., 2000; Heiss, 2002). The resulting utility equation is:

$$U_{ij} = V_{ij} + \varepsilon_{ij}, \quad \text{j = alternative 1, 2, and 3} \tag{1}$$

where U_{ij} is the utility of the ith consumer choosing the jth alternative. Individual i will choose product j only if $U_{ij} > U_{ik}$, where k represents an alternative product.

The probability that individual i will choose alternative j out of a set of l alternatives is:

$$Pr_{ij} = \text{Pr} \left(V_{ij} + \varepsilon_{ij} \geq V_{il} + \varepsilon_{il}; \forall k \neq j \right), \tag{2}$$

for all l in the choice set not equal to j.

Assuming that the observable utility component (V_{ij}) is a linear function of the perceived product attributes (x) and there are k attributes for each alternative, the function of this utility components is:

$$V_{ij} = \sum_{k=1}^{k} B_k \, x_{ijk} = \beta' X_{ijk} \quad \text{k = attributes 1, 2, 3, 4 and 5} \tag{3}$$

where x_{ijk} is the kth attribute value for the jth alternative for the ith consumer, and B_k

represents the coefficients to be estimated which represent the value the consumer places on a particular attribute.

Assuming that the error term (ε_{ij}) is independent and identically distributed with an extreme value distribution and scale parameter equal to 1, the probability that respondent i chooses alternative j is:

$$P_{ij} = \frac{\exp(\beta X_{ijk})}{\sum_{l=1}^{j} \exp(\beta X_{ilk})}, \qquad (4)$$

Relative importance weights were calculated for each attribute. The relative importance weights indicate which attributes are more important in influencing consumer choice. The relative importance was calculated by using the following formula:

$$RI_i = \frac{UR_i}{\sum UR(\forall \ Attributes)} X \ 100, \qquad (5)$$

where RI_i is the relative importance of the ith attribute and UR_i is the utility range for the ith attribute (Harrison et al., 2002). The utility range is the difference between the highest and lowest part-worth value of the attributes.

The willingness-to-pay is used to estimate the amount of money an individual is willing to pay to obtain a specific attribute. In this study willingness to pay was interpreted as a dollar increase that consumers were willing to pay to obtain the packaging and labeling attribute. Willingness-to-pay for attribute i was calculated as the negative ratio of the coefficient for attribute i and the price premium coefficient. It was calculated as:

$$WTP = -\frac{\beta_i}{\alpha}, \qquad (6)$$

where β_i is the coefficient of attribute i and α is the price premium coefficient.

In this study, we used the software package STATA 10.0 to run the CL model for the entire sample and the subgroups.

5. Market Segmentation

Because the CL model uses the characteristics of the alternatives choices to predict the selection, it is more challenging to include personal characteristics in the model specification, since the personal characteristics are constant between choice alternatives. To investigate how choices responses vary across respondent's characteristics, the data was divided into different subgroups based on individual characteristics and demographics. A CL model was applied to different subgroups to see if there is a resemblance between consumer's choices and their attitudes and behaviors.

We group consumers into homogeneous segments. Consumers were segmented according to their lifestyles because previous research has shown that the willingness to pay for a product might be influenced by individual ways of living rather than by the usual socioeconomic characteristics (Hartman and New Hope, 1997).

Factor analysis, cluster analysis and median split were used to identify groups of respondents with similar lifestyles and behaviors. The purpose of the segmentation is to link consumer characteristics with their preference for the packaging and labeling attributes. The first step is to define the variables on which the factor analysis will be based.

A five point Likert-scale with twenty eight variables was administrated to the 253 respondents. The psychographic and behavioral variables used in this survey test which respondents are information seekers, price conscious, health conscious, environmental responsible, time pressure (busy life), weight conscious, which ones choose products for convenience, and who will try a new product (the completed scale is shown in Appendix B). Demographic and frequency of fruit juice consumption were also collected for use in segmentation (presented in Appendix A and C).

Since we are testing some nutritional information attributes in the conjoint experiment, it was important to evaluate if consumers give importance to the information that appears on the front label of the product. The respondent's opinion regarding price issues was used to determine if consumers were price sensitive and compare these results with the selection of the fruit juice product.

Other variables used in the study were time pressure or life equilibrium, and convenience. Today people have less time to cook. Usually they have at least one meal away from home. Measuring the usage of ready to eat products will help us understand why having a fruit juice might have a significant meaning to respondents, because the facility to transport this type of product.

The health and weight conscious variables were included in the study because fruit juices are occasionally considered a healthy product. We hypothesized that people who are interested in having a healthy life will choose a product with an attribute that involves a health improvement. Also people who care about weight might choose the no sugar added claim, instead of the vitamin C claim.

Since we included organic and locally produced products as part of the attributes, measuring which respondents are more environment conscious will give us a better idea why people might choose an organic product rather than a conventional product, or why they choose a product that is locally produced instead of one that is not. The questions about trying a new product were included here in order to explore the relations between the level of risk aversion and acceptance of a new product.

Factor analysis was used reduce the twenty eight variables into a smaller number of factors using SPSS 17. To examine if the factor analysis model was appropriated, we

administrated the Bartlett's and Kaiser-Meyer-Olkin (KMO) tests. Since the objective was determine the minimum number of factors, the method of factor analysis selected was the principal component analysis. To determine the number of factors the procedures we followed were based on the eigenvalues. Only factors with a variance greater than one were included, and based on the percentage of variance. To rotate and interpret the factors, we used the varimax procedure, which minimized the number of variables with high loadings on each factor. The loadings are the correlation coefficients between the variables and the factors. The variables with the highest correlations provide the most meaning (in an interpretation sense) to the factor solution.

After defining the factors, the second step was to perform a cluster analysis. First it was necessary to select an appropriate distance measure which is going to determine how similar or not the objects being clustered are. For this purpose we used the Euclidean distance. Then we selected a hierarchical and the agglomerative cluster procedure. The analysis was performed using Wards minimum variance method where the means of the variables in each cluster are computed, and for each individual the squared Euclidean distance is calculated. The distances are summed for all objects and at each stage, the two clusters with the smallest increase in the overall sum of squares within cluster distance are combined (Malhotra, 2009). We also used the median split to segment the sample into subgroups (high and low) based on the scores of the factor analysis to compare both techniques.

To test whether coefficients vary across subsets of populations, a likelihood test outlined by Louviere and Swait (2000) is going to be use.

$$-2[Ln\ (entire\ sample) - Ln(subgroup1) - Ln\ (subgroup2)] \sim X^{2(d.f)}$$

where the degrees of freedom (d.f.) equals the number of parameters estimates for each group.

CHAPTER IV. RESULTS AND DISCUSSION

The first part of this chapter includes representativeness of the sample and results from the conditional logit, relative of importance and willingness to pay of the aggregate model. The second half discussed the results from the market segmentation, followed by the estimations of the conditional logit, relative of importance and willingness to pay of each segment.

1. **Representativeness of the Sample**

From April 27-29 of 2010, Clear Voice Research (CVR), an online market research company, sent the survey to 4000 U.S. residents. We were charged for each response; therefore, when we achieved to a total of 253 respondents we stop the survey because of cost constraints. Given the sample of 4000 respondents, with 283 starts and 8.9% drop off, the total response rate was 6%.

To assess the representativeness of the sample, demographic characteristics of survey respondents were compared to 2000 census statistics for the U.S. population, see appendix A. The characteristics of survey respondents are similar to the U.S. populations in terms of gender, marital status, ethnic background and household income. However, the sample is somewhat more educated and older compared to the U.S. population.

Other individual characteristics measured included attitude and behavior toward health, diet, price, environmental issues, if they like to try new products, if they used information on the label, usage of convenience products, and time pressure (see appendix B). Approximately 81 percent of respondents reported to check the prices and used ads coupons at the grocery store. More than 70 percent value product information and care about health. More than half of the respondents reported to use ready to eat products, used diet food, and consume recycle goods. At

least 70 percent of the sample will try new products, and 49 percent of the respondents consider having a busy life.

Fruit Juice consumption was also measured, 26.5% of the sample revealed to drink fruit juices at least 2-3 times a week. The majority stated that they consumed fruit juice at home, and usually with breakfast. They prefer orange juice over other fruit juices (See appendix C).

Appendix D illustrates the percentage of respondents choosing alternatives 1 to 3 for each choice set scenario. It is shown that respondents have different preferences with regard to product attributes. Each alternative in each choice set is chosen by at least 7 percent of respondents. Seventeen respondents (6.7%) of the total sample chose the opt-out option for all four choice sets. It is possible that they selected this alternative without considering any of the attribute levels being presented in the choices.

A Hausman test was performed to ensure that the IIA assumption held for our data. We fail to reject the null hypothesis with (Prob>chi2 = 0.9824). The ratio of the probability for any two alternatives is independent of the existence and attributes of any other alternatives. Consequently the CL model is an appropriate model for our data.

2. Conditional Logit Results of the Aggregate Model

The sample consisted of 3036 observations. The results of the CL model are presented in Table 3. The overall model was statistically significant at 0.01% level as denoted by the likelihood ratio test. Results lead to reject the null hypothesis which states that all of the regression coefficients in the model are equal to zero, meaning that the probability of an individual choosing a fruit juice is independent of the attributes presented on the label or package. In our model at least one of the predictor coefficients is not equal to cero.

The log likelihood ratio (LR) chi-square test value is 426.59, with nine degrees of freedom which represent the predictors in our model. Because logistic regression does not have an equivalent to the R-square, McFadden's pseudo R-squared was used. It can be interpreted as an approximation of the proportion of the variation in choosing a fruit juice that is accounted for the attributes; however, in McFadden's pseudo R-squared the values tend to be smaller than R-square. In our model the pseudo R-squared was 0.192.

Table 3. Conditional Logit Results of Aggregate Model of Consumers for 100% Fruit Juice Products.

	Coefficient	Std. Error
Material of package		
Pet Bottles	1.61***	0.140
Tetra-Pack	0.088	0.143
Health and Nutritional Claims		
No Sugar Added	0.45***	0.153
Vitamin C	0.056	0.159
Nutritional Index	0.108	0.168
Locally Produced	0.114	0.101
Organic	0.042	0.126
Price	-1.55***	0.24
Neither Option (ASC)	-1.72***	0.189
Number of Observations: 3036		
LR chi2 (9) = 426.59		
Log Likelihood = -898. 5		
***α = 1%		

Results showed that PET bottles, no sugar added, price, and the ASC for the neither option, have the expected signs and were significant in the model. The other health claim levels (vitamin C and the nutritional index), and the attributes of organic and locally produced have the correct sign but were not significant.

The coefficients were as expected, negative for the neither option and for the price. This agrees with consumer theory which states that product utility decreases as price increases. The negative sign for the alternative constant indicates that, on average, respondent's prefered option

A or B (fruit juices packages) than the neither option (choice C). The positive signs for the rest of the attributes indicate that respondent's utility increases when adding these attributes. In particular, the positive sign for PET bottle suggest that this package material is preferred to the tetra-pack, and can.

For the nutritional claim attribute the no sugar added label is preferred. This suggests that consumers in this sample tend to respond to a marketing label with a diet claim, rather than nutritional information, such as the Vitamin C or a nutritional index. This is consistent with the findings from a survey conducted in 2007 by the International Food Information Council Foundation (IFIC). They reported that 70 percent of Americans stated being "somewhat or extremely concerned" with the amount of sugar they consume. They reported that more than half of Americans are trying to "lose weight". When they asked them which information they use from the labels and nutritional facts, sugar accounted for approximately 63 percent, a percentage slightly below calories and total fat and *Trans* fat. Conversely, Vitamins and Minerals were at the bottom of the list accounting for only 35%. The nutritional index was not tested by the IFIC study.

3. Relative Importance of the Aggregate Model

To understand which of the attributes has more influence on consumer choice, the relative importance of the attributes was calculated using the equation (5) described in chapter III. The results of the relative importance estimates show the packaging material is the most important attribute, being PET bottles the most appealing level to respondents. Consumers are concerned about price (34%), it was the second most important attribute. As expected, the lowest price is associated with higher utility. The nutritional claim was also important (12%), with No

Sugar Added being the most important level, followed by locally produced (6%), and organic

(3%) which have the lower relative importance weights, see figure 3.
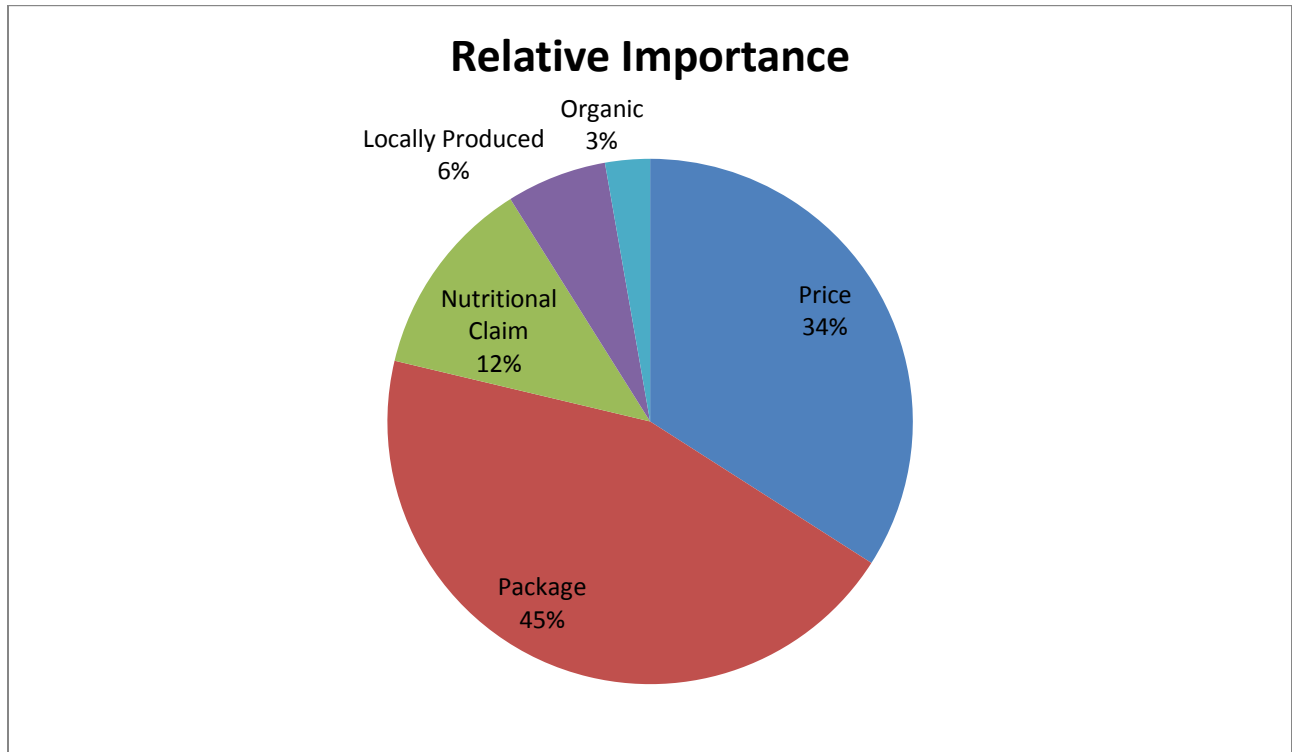
Figure 3. Relative Importance of Aggregate Model

In recent years, various manufacturers, retailers, and health organizations have developed

symbols that indicate the nutritional value of food products. The FDA has been aware of this

trend in labeling; however, they don't have enough information to show how these symbols

affect a consumer's food choices. A fictitious nutrition index was included in study, to analyze

the impact of this feature on consumer's purchasing decisions. Even though the parameter

estimate of this attribute was not significant, respondents did place a positive value on it,

meaning that consumer's utility increases when fruit juices have this symbol.

Respondents in the study prefer a local product over organic ingredients. The term

"Locally produced" is a growing trend. One possible reason why the organic attribute was the

lowest attribute rated in our sample is because organic sales account for only 3 percent of total

U.S. food sales. Of that 3 percent, beverages account for 13 percent of U.S organic food sales in 2008 (ERS, 2009). Other possible reason is because the sample for this study may not be large enough to reflect trends in organic and locally produced sales.

4. Willingness to Pay of the Aggregate Model

Equation (6) discussed in chapter III was used to calculate willingness to pay. The willingness-to-pay values in this study are interpreted as the dollar amount that consumers were willing to pay to obtain the specific attribute level. Table 4 presents WTP estimates calculated using the CL estimates.

Results suggest that, on average, respondents are willing to pay more ($1.04) for the PET bottles; however, they will only pay $0.05 more for a tetra-pack. For the nutritional claims, "No sugar added" worth $0.29 more, $0.04 more for the vitamin C claim, and $0.07 more for the

Table 4. Willingness to Pay Results of Aggregate Model of Consumers for 100% Fruit Juice Products.

	Willingness to Pay $
Material of package	
Pet Bottles	$1.04
Tetra-Pack	$0.05
Health and Nutritional Claims	
No Sugar Added	$0.29
Vitamin C	$0.04
Nutritional Index	$0.07
Locally Produced	$0.07
Organic	$0.03

nutritional index. They will pay $0.07 more for a locally produce fruit juice, and $0.03 more for an organic product.

5. Predicted Probabilities

Results from the conditional logit of the aggregate model were used to calculated

predicted probabilities based on equation (4) described in chapter III, see table 5.

Table 5. Predicted Probabilities.

	Predicted Probability	Actual Probability
Alternative 1: Can, 100% Vitamin C, Locally Produced, Organic,$1.60	15%	13%
Alternative 2: Pet Bottle, Nutritional Index, Organic, $1.20	72%	72%
Alternative 3: I would not buy either product to the left	13%	15%

Actual probabilities represent the percentage of respondents choosing alternative 1, alternative 2

or alternative 3 the neither option of the holdout choice. Results from both estimates suggest that

the model was accurate in predicting choice probabilities.

6. Market Segmentation

A factor analysis was used to group related variables into different segments. To examine

if the factor analysis model was appropriate, a Bartlett's and Kaiser-Meyer-Olkin (KMO) tests

was administrated. Both techniques indicated that the model was appropriate and significant, the

Bartlett's test showed an approximate Chi-squared of 2737.73, and significant at the 0.01 level.

The value of the KMO test was (0.802) is also greater than 0.5. One variable (I try to find the

balance between work and my private life) was dropped from the analysis since it has a value

smaller than 0.5 on the communalities, meaning that it does not fit well with the factor solution.

Seven factors with eigenvalues greater than one were defined, and all combined account

for 70% of the total variance. The first factor after rotation explains 12.3% of the variance, the

second factor accounts for 12.1% of the variance, the third 10%, the fourth 9.9%, the fifth 9.6%, the sixth 8.8%, and the seventh 7.1%, see table 6.

The variables were assigned to each factor based on the rotated loadings. We labeled each factor based on the variables, factor 1 was labeled the diet product users, factor 2 the information seekers, factor 3 the price sensitive, factor 4 the new product users, factor 5 the environmentally conscious, factor 6 the convenience product users and factor 7 the health conscious, see appendix H.

Table 6. Variance Explained by the Factors.

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.439	25.902	25.902	2.597	12.366	12.366
2	2.336	11.124	37.026	2.538	12.086	24.452
3	1.972	9.393	46.419	2.107	10.036	34.487
4	1.514	7.210	53.629	2.085	9.928	44.415
5	1.364	6.496	60.124	2.033	9.682	54.097
6	1.073	5.108	65.233	1.854	8.829	62.926
7	1.009	4.803	70.036	1.493	7.110	70.036
Extraction Method: Principal Component Analysis.						

7. Cluster Analysis Results

After defining the factors, the second step was to create segments based on those factors. Five clusters were identified based on the coefficients with large increases between stages, with the dendogram, and with the centroides. The five clusters were relatively distributed 24.5 percent of the sample, 12.6 percent, 15.4 percent, 37.5 percent, and 9.8 percent of the sample. Because a five cluster grouping seemed to be more meaningful and more consistent with observed consumer behavior than six and seven cluster grouping, the five cluster solution was chosen. For the interpretation we examined the clusters centroides. The centroides are the mean values of the objects contained in the cluster on each variable. We looked for high values in each cluster.

Cluster 1 was labeled the environmentally conscious and information seeker, cluster 2 the convenience product users, cluster 3 the price conscious, cluster 4 the diet product users, and cluster 5 the health conscious.

a. Conditional Logit Results of the Cluster Analysis

In order to examine the relationship between consumer preferences for fruit juices and consumer characteristics, a conditional logit was estimated based on the market segments. The results of the conditional logit model are presented in Table 7.

Table 7. Conditional Logit Results of Consumer Segments Based on Cluster Analysis for 100% Fruit Juice Products.

	Environment Conscious and Info. Seeker	Convenience Product User	Price Conscious	Diet Product User	Health Conscious
Material of package					
Pet Bottles	1.35***	1.86***	2.29***	1.73***	1.63***
	(.274)	(.499)	(.435)	(.231)	(.503)
Tetra-Pack	-.300	.591	.333	-.076	.853
	(.283)	(.436)	(.456)	(.234)	(.542)
Health and Nutritional Claims					
No Sugar Added	1.09***	-.359	.301	.298	.781
	(.344)	(.425)	(.472)	(.241)	(.508)
Vitamin C	.257	-.424	.321	-.185	.685
	(.335)	(.472)	(.472)	(.257)	(.546)
Nutritional Index	.522	.200	.003	-.292	.311
	(.350)	(.475)	(.526)	(.279)	(.587)
Locally Produced	.047	.109	.407	-.017	.298
	(.199)	(.323)	(.334)	(.167)	(.348)
Organic	.1555	.215	.177	-.186	-.015
	(.274)	(.389)	(.353)	(.213)	(.389)
Price	-1.85***	-1.53***	-2.70***	-1.01***	-1.95***
	(.407)	(.567)	(.580)	(.304)	(.615)
Neither Option (ASC)	-2.19***	-2.61***	-1.92***	-1.61***	-.754
	(.485)	(.751)	(.717)	(.396)	(.821)

Note: Numbers in parenthesis are standard error.
* Significant at 10% level, ** Significant at 5% level, *** Significant at 1% level.

Cluster 1, the environmentally conscious and information seeker group, showed that PET bottles, no sugar added, price, and the ASC for the neither option were significant in the model.

The rest of the health claims (vitamin C and the nutritional index), and the attributes of organic and locally produced were not significant in the purchasing decision of fruit juices; however, they have the expected signs. The majority of respondents belonging to this cluster are females (61.3%), married, and between the ages of 55 to 64 years old. Thirty five percent of the cluster had a bachelor degree or higher education, with average annual incomes ranging from $35,000 to $74,999.

In cluster 2, the convenience product users, results showed that PET bottles, price, and the neither option, were significant in the model. The health claims levels, and the organic and locally produced attributes were not significant in the purchasing decision of fruit juices. The coefficients were negative for the neither option, and for the price as expected; however, vitamin C and no sugar added health claims were also negative, indicating that convenience buyers were more likely to prefer a product without these claims. The positive signs for the rest of the attributes indicate that respondent's utility increases when adding these attributes. Results from the conditional logit showed that package material is very important to respondents in this segment. The cluster is composed mainly by males 59.4%, under the age of 44 years, with a university degree, and annual incomes greater than the median ($35,000 - $49,999).

In cluster 3, the price conscious group, results showed that only PET bottles, price, and the ASC for the neither option, were significant in the model. None of the health claims levels, nor the attributes of organic and locally produced were not significant in the purchasing decision of fruit juices for this segment. The coefficients were as expected, negative for the neither option and for the price, and positive signs for the rest of the attributes indicate that respondent's utility increases when adding these attributes. Results from the cluster analysis and the conditional logit concurred that price is very important to respondents in this segment. Actually the price

coefficient was the highest compare to the other clusters. This cluster is composed mainly by females, between the ages of 35 to 64, with some college or lower education, who received an annual income inferior than $35,000. It makes sense since respondents from this group has a relative low income, price is very important when deciding which products to buy.

In cluster 4, the diet product user, results showed that only PET bottles, price, and the ASC for the neither option, were significant in the model. None of the health claims, nor the organic and locally produced attributes were significant in the purchasing decision of fruit juices for this segment. The coefficients were as expected for the neither option and for the price; however, the rest of the levels have negative signs, indicating that respondent's utility decrease by adding these attributes. These results concurred with the results from the cluster analysis which indicated that this subgroup it is not very attached to any of the factors we study. This cluster is composed mainly by men, between the ages of 45 to 64, with some level of education, 38.9 percent of the cluster has a bachelor degree or graduate, and annual incomes of $35,000 to $99,999.

In cluster 5, the health conscious group, only PET bottles and price were significant. None of the health claims levels, nor the organic and locally produced attributes were significant. The ASC for the neither option was also not significant in the purchasing decision of fruit juices for this segment. The coefficients were as expected for the neither option and for the price. All the levels of the nutritional and health claims have positive signs, suggesting utility increases by adding these attributes. Respondents belonging to this cluster are sensitive to price and try to eat healthy. One possible reason why respondents in the cluster are health conscious may be the age, 76% of the cluster is composed by people older than 45, the majority over 65 year old. In this

cluster 60% of the group is female. The majority have some education (high school or some college), and annual incomes lower than $50,000.

b. Relative Importance of the Cluster Analysis

To understand which of the attributes has more influence on consumer choice, the relative of importance of the attributes was calculated for each of the clusters, see table 8. The environment conscious and information seeker segment consider material of the package the most important attribute, followed very closely by price. The nutritional and health claims have the highest percentage compared to the other segments. The convenience product users consider material of the package very important (42%). In the price sensitive segment, price and package are the most important attributes. For the diet product users package material is extremely important (51%), and for the nutritional claims "No Sugar Added" was the most important level. For the health conscious group again package and price were the most important attributes, but the nutritional and health claims and locally produced attributes were also important.

Table 8. Relative Importance of Consumer Segments Based on Cluster Analysis for 100% Fruit Juice Products.

	Environment Conscious and Info. Seeker	Convenience Product User	Price Conscious	Diet Product User	Health Conscious
Price	31%	27%	37%	23%	34%
Package Material	34%	42%	38%	51%	35%
Nutritional and Health Claims	25%	13%	6%	19%	17%
Locally Produced	3%	3%	14%	2%	13%
Organic Ingredients	6%	15%	5%	5%	2%

c. Willingness to Pay of the Cluster Analysis

The willingness-to-pay values in this study are interpreted as the dollar amount that consumers were willing to pay to obtain the specific attribute level. Table 9 presents WTP estimates for the all clusters.

Table 9. Willingness to Pay of Consumer Segments Based on Cluster Analysis for 100% Fruit Juice Products.

	Environment Conscious and Info. Seeker	Convenience Product User	Price Conscious	Diet Product User	Health Conscious
Tetra-pack	$ (0.16)	$ 0.39	$ 0.12	$ (0.08)	$ 0.44
Pet bottles	$ 0.73	$ 1.22	$ 0.85	$ 1.72	$ 0.84
No sugar added	$ 0.59	$ (0.24)	$ 0.11	$ 0.29	$ 0.40
Vitamin C	$ 0.14	$ (0.28)	$ 0.12	$ (0.18)	$ 0.35
Nut. Index	$ 0.28	$ 0.13	$ 0.00	$ (0.29)	$ 0.16
Locally Produced	$ 0.03	$ 0.07	$ 0.15	$ (0.02)	$ 0.15
Organic Ingredients	$ 0.08	$ 0.14	$ 0.07	$ (0.19)	$ (0.01)

On average, respondents in the environment conscious and information seeker segment are willing to pay more for the nutritional and health claims than any other segment. Only diet product users are willing to pay more for the PET bottles ($1.72) than convenience products users ($1.22). The last segment will pay more for the organic ingredients ($0.14) than any other segment. Respondents in the price sensitive group place a positive value on all attributes except for the nutritional index. The health conscious group is willing to pay a premium of $0.40 for the no sugar added product, $0.35 for the vitamin C claim, and $0.16 for the nutritional index.

8. Median Split Results

A median split another segmentation technique explained in chapter III was used to determine if group respondents differ from the aggregate model. New variables were created by summing the ratings of the attitudinal questions in each factor for each respondent. Respondents were categorized as high and low for each of the factors via a median split.

For instance for factor 1, respondents scoring higher than 8 points (median) in the following questions: I have use diet foods at least one meal a day, I eat more low calorie food than the average person, and I often choose food/beverage because they contribute to weight control, were split to create high and low diet product users. The same procedure was used for

the rest of the factors.

Demographic characteristics were compared for each subgroup, see appendix I. People who use a lot of diet products have higher levels of education compare to the low users. The price sensitive group is composed mainly of females, living in the South, with incomes and education lower than the non sensitive group. The environmentally conscious group is younger, more educated and with relative higher incomes than those who are not that concern for the environment. People who are more likely to try a new product are younger people. Older people (over 65 years old) use less convenience products, have less education than convenience product users. Forty percent of the health conscious group is over 55 years old.

9. Conditional Logit for Each Segment Based on Median Split and Demographic Characteristics

To examine the effect of consumer characteristics on choice decisions and consumer preferences, the data was divided into different subgroups based on the results from the median split, from demographic information, and fruit juice consumption (gender, age, education, income, and fruit juice consumption). A conditional logit model was used to estimate each subgroup, see table 10 and 11.

A test outlined by Louviere and Swait (1993, 2000) was used to test if there are differences between the estimates of the sub-groups, see appendix N. Results led to reject the null hypothesis that subgroups share the same coefficient estimates for the environmentally conscious, information seeker, and age subgroups. For the rest of the subgroups, parameter estimates were not statistically different between respondents. Since only these three subgroups demonstrated to be significantly different for the aggregate model the following section will explain the results from the conditional logit, relative of importance and willingness to pay for only those subgroups.

Table 10. Conditional Logit Results of Consumer Segments Based on Median Split for 100% Fruit Juice Products.

	Health Conscious		Environmentally Conscious		Diet Product Users		Information Seeker		Price Conscious		Convenience Product Users		New Product User	
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
Material of package														
Pet Bottles	1.656 ***	1.628 ***	1.703 ***	1.544 ***	1.683 ***	1.544 ***	1.538 ***	1.969 ***	1.426 ***	1.863 ***	1.392 ***	1.911 ***	1.591 ***	1.667 ***
	(0.175)	(0.245)	(0.185)	(0.223)	(0.203)	(0.199)	(0.173)	(0.270)	(0.187)	(0.218)	(0.189)	(0.213)	(0.176)	(0.235)
Tetra-Pack	0.197	-0.067	0.095	0.118	0.179	0.02	0.218	-0.079	0.021	0.185	0.195	-0.034	0.007	0.229
	(0.184)	(0.224)	(0.197)	(0.215)	(0.213)	(0.198)	(0.181)	(0.24)	(0.192)	(0.22)	(0.198)	(0.209)	(0.18)	(0.234)
Health and Nutritional Claims														
No Sugar Added	0.433 **	0.443 *	0.325 *	0.677 ***	0.551 **	0.339	0.523 ***	0.335	0.461 **	0.461 **	0.7181 **	0.117	0.585 ***	0.257
	(0.187)	(0.268)	(0.197)	(0.252)	(0.222)	(0.214)	(0.189)	(0.275)	(0.205)	(0.235)	(0.212)	(0.224)	(0.198)	(0.247)
Vitamin C	0.106	-0.0 58	0.041	0.126	0.246	-0.163	0.26	-0.325	-0.005	0.137	0.262	-0.206	0.201	-0.156
	(0.193)	(0.282)	(0.205)	(0.258)	(0.224)	(0.231)	(0.201)	(0.27)	(0.221)	(0.233)	(0.222)	(0.232)	(0.205)	(0.257)
Nutritional Index	-0.102	0.401	-0.23	0.543 **	0.198	-0.081	0.065	0.237	0.001	0.198	0.232	-0.054	0.085	0.159
	(0.211)	(0.288)	(0.226)	(0.264)	(0.243)	(0.243)	(0.211)	(0.291)	(0.231)	(0.254)	(0.233)	(0.249)	(0.218)	(0.269)
Locally Produced	0.038	0.192	0.139	0.065	0.085	0.131	0.228 *	-0.166	0.209	-0.014	0.126	0.087	0.129	0.086
	(0.126)	(0.178)	(0.138)	(0.155)	(0.147)	(0.144)	(0.127)	(0.181)	(0.139)	(0.153)	(0.138)	(0.153)	(0.13)	(0.164)
Organic	0.035	-0.022	-0.147	0.337 *	-0.007	0.072	0.041	0.012	0.028	0.064	0.13	-0.082	-0.025	0.16
	(0.153)	(0.226)	(0.164)	(0.202)	(0.177)	(0.183)	(0.154)	(0.229)	(0.175)	(0.184)	(0.171)	(0.19)	(0.162)	(0.204)
Price	-1.61 ***	-1.484 ***	-1.485 ***	-1.782 ***	-2.021 ***	-1.063 ***	-1.437 ***	-1.845 ***	-1.189 ***	-1.965 ***	-1.673 ***	-1.412 ***	-1.493 ***	-1.641 ***
	(0.232)	(0.335)	(0.249)	(0.304)	(0.273)	(0.267)	(0.233)	(0.341)	(0.257)	(0.285)	(0.26)	(0.281)	(0.242)	(0.309)
Neither Option (ASC)	-1.711 ***	-1.849 ***	-1.573 ***	-2.056 ***	-2.058 ***	-1.392 ***	-1.246 ***	-2.682 ***	-1.413 ***	-2.051 ***	-1.58 ***	-1.926 ***	-1.534 ***	-1.991 ***
	(0.294)	(0.429)	(0.324)	(0.369)	(0.341)	(0.346)	(0.305)	(0.415)	(0.336)	(0.354)	(0.331)	(0.357)	(0.311)	(0.388)

Note: Numbers in parenthesis are standard error.
* Significant at 10% level, ** Significant at 5% level, *** Significant at 1% level.

Table 11. Conditional Logit Results of Consumers Demographic and Fruit Juice Consumption Subgroups for 100% Fruit Juice Products.

	Gender		Age		Education		Income		Fruit Juice Consumption	
	Males	Females	Younger 55	Older 55	Less Bachelor	Bachelor or more	Less 50K	More 50K	Less 3 times week	More 3 times week
Material of package										
Pet Bottles	1.569 ***	1.655 ***	1.8 ***	1.314 ***	1.646 ***	1.581 ***	1.431 ***	1.817 ***	1.526 ***	1.881 ***
	(0.209)	(0.191)	(0.183)	(0.221)	(0.18)	(0.224)	(0.192)	(0.206)	(0.166)	(0.272)
Tetra-Pack	0.098	0.056	0.142	-0.054	0.009	0.221	0.156	0.007	0.135	-0.005
	(0.217)	(0.192)	(0.184)	(0.233)	(0.186)	(0.227)	(0.197)	(0.21)	(0.174)	(0.256)
Health and Nutritional Claims										
No Sugar Added	0.455 *	0.474 **	0.296	0.679 ***	0.513 ***	0.349	0.514 ***	0.378 *	0.394 **	0.574 **
	(0.2350	(0.204)	(0.195)	(0.248)	(0.199)	(0.241)	(0.21)	(0.226)	(0.181)	(0.292)
Vitamin C	0.158	0.003	0.063	0.017	0.233	-0.235	0.14	-0.039	0.006	0.154
	(0.238)	(0.216)	(0.209)	(0.251)	(0.205)	(0.255)	(0.22)	(0.232)	(0.19)	(0.295)
Nutritional Index	0.066	0.165	0.1	0.104	0.1	0.0965	0.277	-0.093	0.02	0.304
	(0.257)	(0.224)	(0.216)	(0.272)	(0.22)	(0.263)	(0.229)	(0.25)	(0.213)	(0.311)
Locally Produced	0.129	0.093	0.22 *	-0.065	0.086	0.148	0.162	0.066	0.227 *	-0.164
	(0.152)	(0.138)	(0.131)	(0.164)	(0.132)	(0.16)	(0.139)	(0.15)	(0.121)	(0.19)
Organic	0.243	-0.143	-0.054	0.153	-0.067	0.203	0.101	-0.015	0.051	-0.01
	(0.187)	(0.173)	(0.165)	(0.2)	(0.164)	(0.199)	(0.172)	(0.186)	(0.15)	(0.235)
Price	-1.899 ***	-1.253 ***	-1.274 ***	-1.964 ***	-1.578 ***	-1.498 ***	-1.672 ***	-1.419 ***	-1.577 ***	-1.526 ***
	(0.352)	(0.255)	(0.243)	(0.308)	(0.245)	(0.3)	(0.262)	(0.277)	(0.227)	(0.354)
Neither Option (ASC)	-1.977 ***	-1.502 ***	-1.555 ***	-2.045 ***	-1.763 ***	-1.64 ***	-1.787 ***	-1.651 ***	-1.715 ***	-1.776 ***
	(0.352)	(0.335)	(0.315)	(0.385)	(0.312)	(0.383)	(0.332)	(0.351)	(0.289)	(0.446)

Note: Numbers in parenthesis are standard error.
* Significant at 10% level, ** Significant at 5% level, *** Significant at 1% level.

a. Environmentally Conscious Group

The results of the CL model for the environmentally conscious group show that PET bottles, no sugar added, price, organic ingredients, nutritional index and the ASC for the neither option, were significant in the model (see table 8). The vitamin C and locally produced were not significant in the purchasing decision of fruit juices. For the respondents who are not really interested in the environment, only PET bottles, no sugar added, price, and the ASC for the neither option, were significant in the model, see table 7. The coefficients were as expected, negative for the neither option and for the price. The negative sign for the alternative constant indicated that respondent's preferred fruit juices packages than the neither option, and a lower price. The positive signs for the rest of the attributes indicate that respondent's utility increases when adding these attributes. However, in the low environmentally conscious group, the nutritional index and organic were negative, indicating that utility decreased by adding these attributes.

b. Information Seeker Group

Results of the information seeker group show that people for who usually don't read and compare labels, PET bottles, no sugar added, price, locally produced, and the ASC for the neither option, were significant in the model. For the information seeker only PET bottles, no sugar added, price, and the ASC for the neither option, were significant. For respondents who usually don't read and compare labels, coefficients were negative for the neither option and for the price, and positive signs for the rest of the attributes indicated that respondent's utility increased when adding these attributes. However, for the information seeker group, tetra-pack, locally produce and 100% Vitamin C were negative, indicating that utility decrease by adding these attributes.

c. Age group

Previous studies have suggested that respondents in different age groups and other social groups have different preferences for food attributes (Pitman & Reinhardt, 2000). Results from the group of respondents younger than 55 years showed that PET bottles, price, locally produced, and the ASC for the neither option, were significant in the model. Results for respondents older than 55 years old show that PET bottles, no sugar added, price, and the ASC for the neither option, were significant. The coefficients signs were as expected for both subgroups, negative for the neither option and for the price, and positive signs for the rest of the attributes. Only for those who are older than 55 years old, the locally produced attribute was negative.

10. Relative Importance of the Segments

To understand which of the attributes has more influence on consumer choice, the relative of importance of the attributes was calculated for the three groups.

a. Environmentally Conscious Group

The results of the relative importance estimates showed that material of package was the most important attribute to respondents; however, price is more important to consumers who are less environmentally conscious. Organic ingredients (18%) and the nutritional claim (18%) are more important to people with a high concern about the environment, see figure 4.

b. Information Seeker Group

The results of the relative importance estimates showed that packaging material was the most important attribute to respondents, followed by price. The nutritional claim attribute was equally important to both no-information and information seekers. The notable differences when comparing the relative importance was for the attribute of locally produced and the organic

ingredients. Consumers who usually don't read labels consider locally produced and organic products more important than high information seekers, see figure 5.
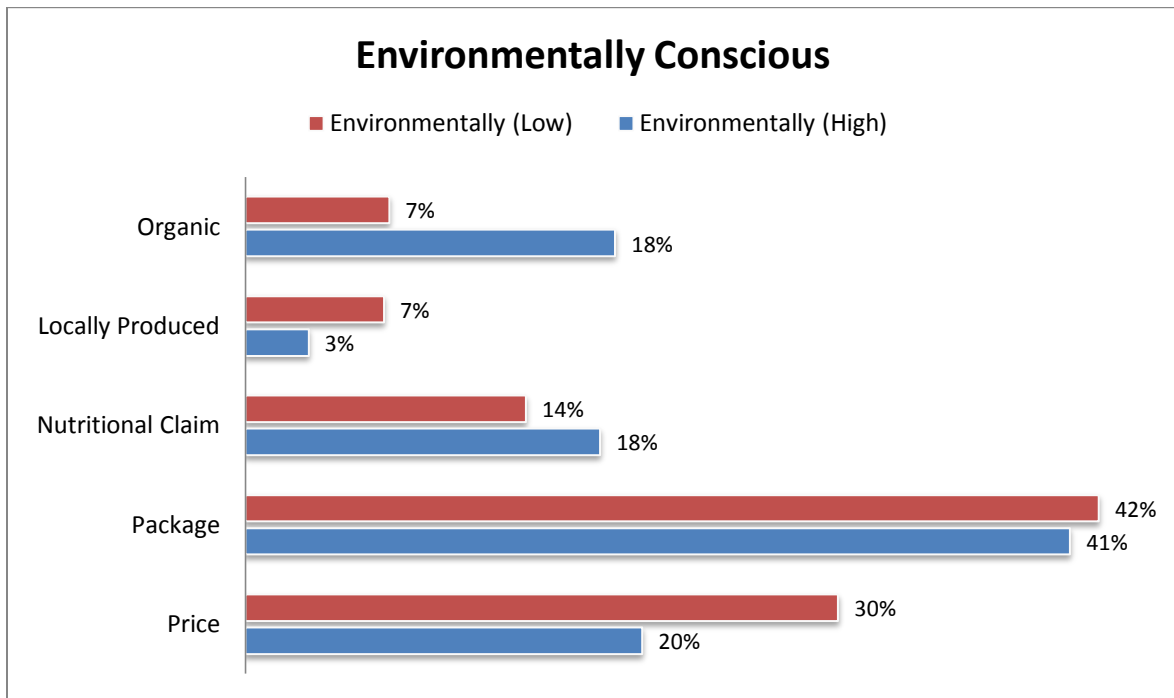
Figure 4. Relative Importance of Environmentally Conscious Subgroup

Figure 5. Relative Importance of Information Seeker Subgroup

However, when comparing the part-worth utilities of the attribute of nutritional and health claims, information seekers prefer the nutritional index, and low information seekers prefer the Vitamin C claim. The No sugar added claim was slightly prefer by low information seeker, see figure 6.

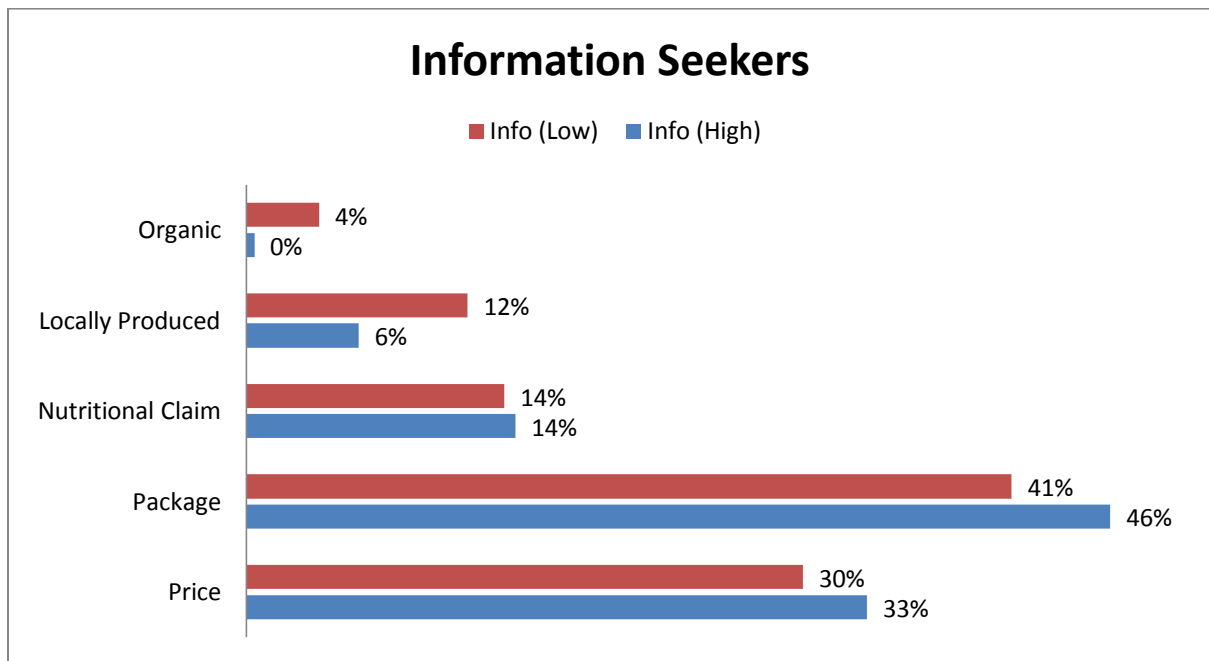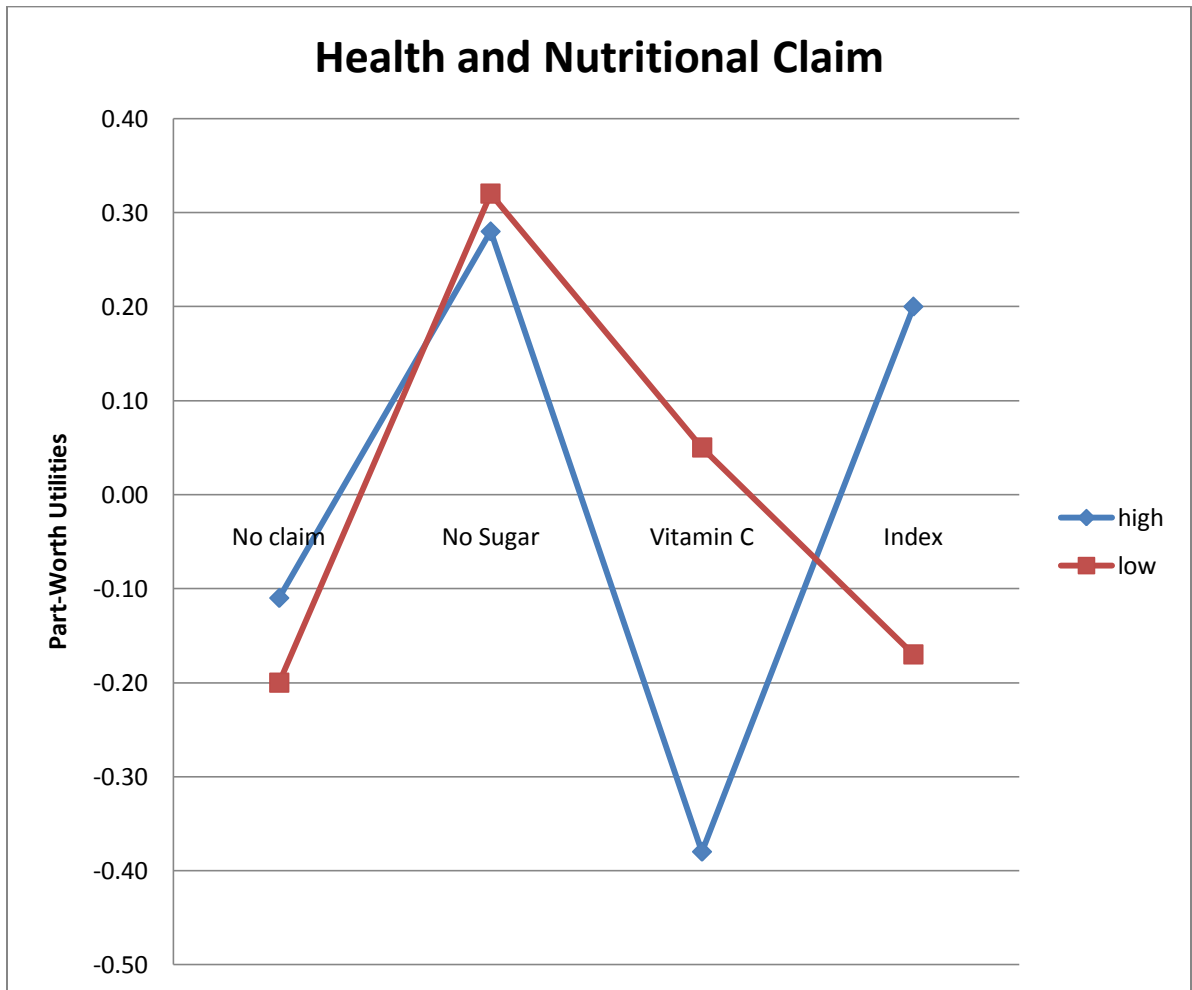**Figure 6. Part-Worth Utilities for the Health and Nutritional Claim**

c. **Age Group**

The results of the relative importance estimates showed that packaging material and price are the most important attributes to respondents. Younger people considered organic products more important than older people. Some differences found when comparing the relative of

importance was for the attribute of locally produce, younger people consider locally produced products more important than older people. Older people appreciate more the nutritional claims compare to younger people, see figure 7.
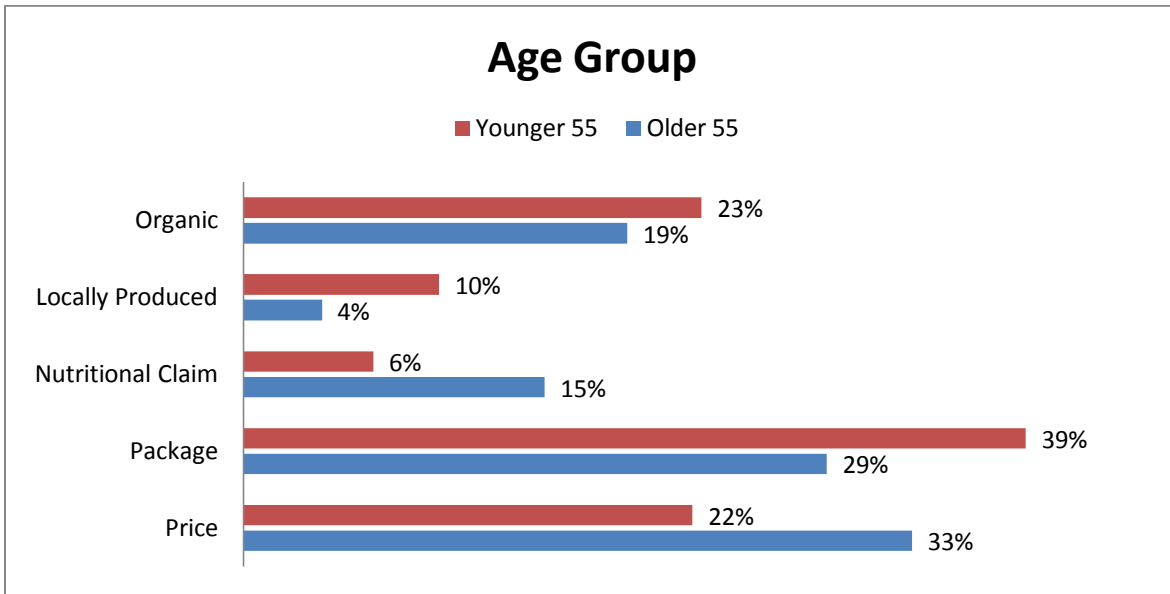
Figure 7. Relative Importance of Age Subgroup

11. Willingness to Pay of Segments

The willingness-to-pay values in this study are interpreted as the dollar amount that consumers were willing to pay to obtain the specific attribute level. Table 12 and13 present WTP estimates for the all subgroups based on the segments, demographic information, and fruit juice consumption.

a. Environmentally Conscious Group

On average, respondents who are high environmentally conscious are willing to pay less ($.087) for the PET bottles than respondents who are not environmentally conscious ($1.15). One possible reason might be because this type of material requires greater processing to be recycled. These same respondents place a positive value on all nutritional attributes. They are willing to pay a premium of $0.07 for the Vitamin C, $0.38 for the no sugar added, and $0.31for

Table 12. Willingness to Pay Results of Consumer Segments Based on Median Split for 100% Fruit Juice Products.

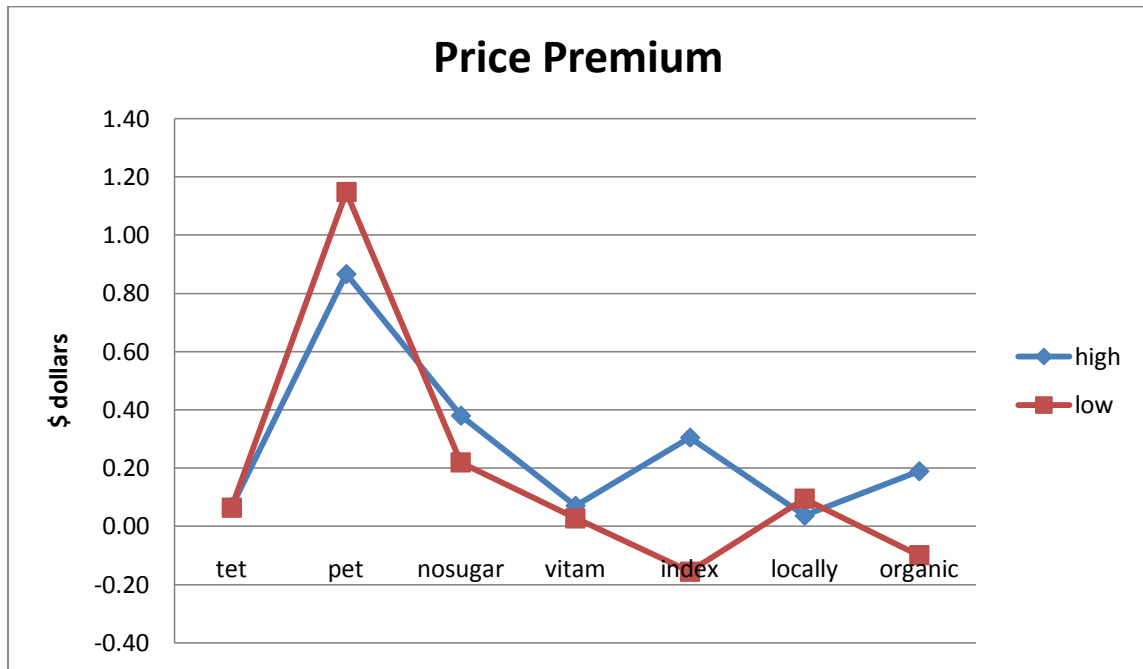|	Health Conscious		Environmentally Conscious		Diet Product Users		Information Seeker		Price Conscious		Convenience Product		New Product Users	
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
Material of package														
Pet Bottles	$1.03	$1.10	$1.15	$0.87	$0.83	$1.50	$1.07	$1.07	$1.20	$0.95	$0.83	$1.35	$1.07	$1.02
Tetra-Pack	$0.12	($0.05)	$0.06	$0.07	$0.09	$0.02	$0.15	($0.04)	$0.02	$0.09	$0.12	($0.02)	$0.01	$0.14
Health and Nutritional Claims														
No Sugar Added	$0.27	$0.30	$0.22	$0.38	$0.27	$0.32	$0.36	$0.18	$0.39	$0.23	$0.43	$0.08	$0.39	$0.16
Vitamin C	$0.07	($0.04)	$0.03	$0.07	$0.12	($0.15)	$0.18	($0.18)	$0.00	$0.07	$0.16	($0.15)	$0.14	($0.10)
Nutritional Index	($0.06)	$0.27	($0.16)	$0.31	$0.10	($0.08)	$0.05	$0.13	$0.00	$0.10	$0.14	($0.04)	$0.06	$0.10
Locally Produced	$0.02	$0.13	$0.09	$0.04	$0.04	$0.12	$0.16	($0.09)	$0.18	($0.01)	$0.08	$0.06	$0.09	$0.05
Organic	$0.02	($0.02)	($0.10)	$0.19	$0.00	$0.07	$0.03	$0.01	$0.02	$0.03	$0.08	($0.06)	($0.02)	$0.10

Table 13. Willingness to Pay Results of Consumers Demographic and Fruit Juice Consumption Subgroups for 100% Fruit Juice Products.

	Gender		Age		Education		Income		Fruit Juice Consumption	
	Males	Females	Younger 55	Older 55	Less Bachelor	Bachelor or more	Lower 50K	Greater 50K	Less 3 times week	More 3 times week
Material of package										
Pet Bottles	$0.83	$1.32	$1.41	$0.67	$1.04	$1.06	$0.86	$1.28	$0.97	$1.23
Tetra-Pack	$0.05	$0.05	$0.11	($0.03)	$0.01	$0.15	$0.09	$0.01	$0.09	$0.00
Health and Nutritional Claims										
No Sugar Added	$0.24	$0.38	$0.23	$0.35	$0.33	$0.23	$0.31	$0.27	$0.25	$0.38
Vitamin C	$0.08	$0.00	$0.05	$0.01	$0.15	($0.16)	$0.08	($0.03)	$0.00	$0.10
Nutritional Index	$0.03	$0.13	$0.08	$0.05	$0.06	$0.06	$0.17	($0.03)	$0.01	$0.22
Locally Produced	$0.07	$0.07	$0.17	($0.03)	$0.06	$0.10	$0.10	$0.47	$0.14	($0.11)
Organic	$0.13	($0.11)	($0.04)	($0.08)	($0.04)	$0.14	$0.06	($0.01)	$0.03	($0.01)

the nutritional index. In contrast, low environmentally conscious do not place a positive value to the nutritional index. Environmental conscious respondents are willing to pay $0.19 more for organic ingredients, contrary to not environmentally conscious people who are not willing to pay a premium, see figure 8.

Figure 8. Willingness to Pay Environmentally Conscious Group

b. Information Seeker Group

On average, respondents who used information on the labels to choose food products are willing to pay $0.13 more for the nutritional index, compare to the $0.05 that low information seeker will pay. High information seeker won't pay a premium for the vitamin c claim or the locally produced logo, see figure 9.

c. Age Group

Older people (over 55 years old) are willing to pay $0.35 more for a "No Sugar Added" claim, compare to younger people (under 55 years old) that will pay only $0.23, see figure 10.

On the other hand, younger people are willing to pay more for local products relative to older people. They will pay more than double ($1.41) relative to older people ($0.67) for a PET bottle.
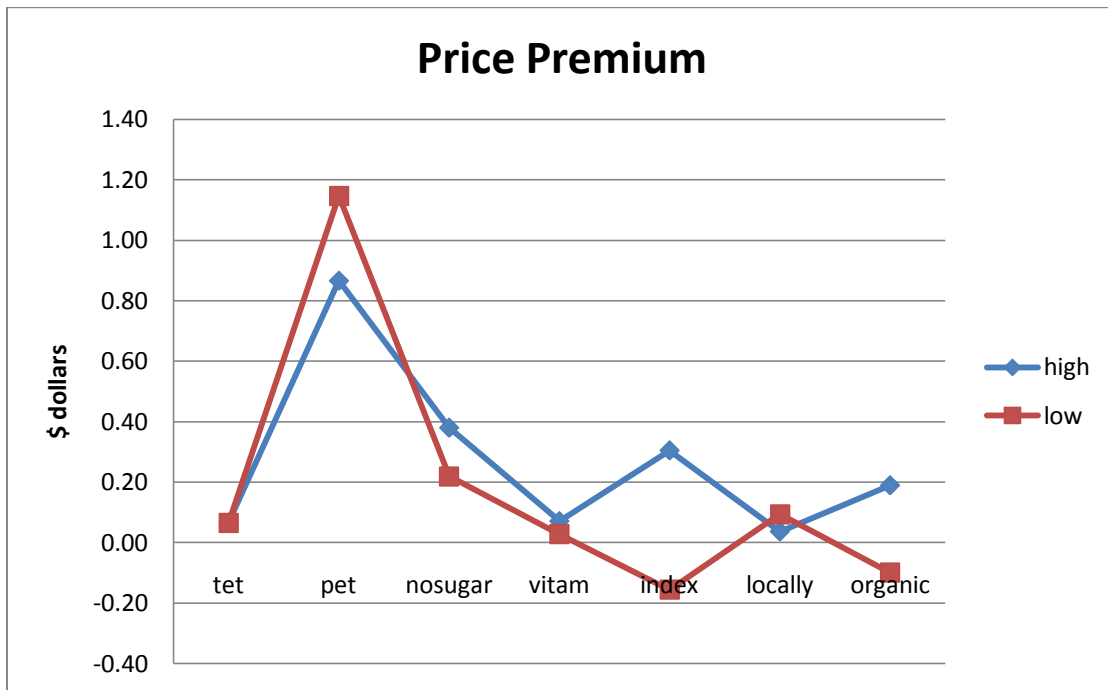
Figure 9. Willingness to Pay Information Seeker Group
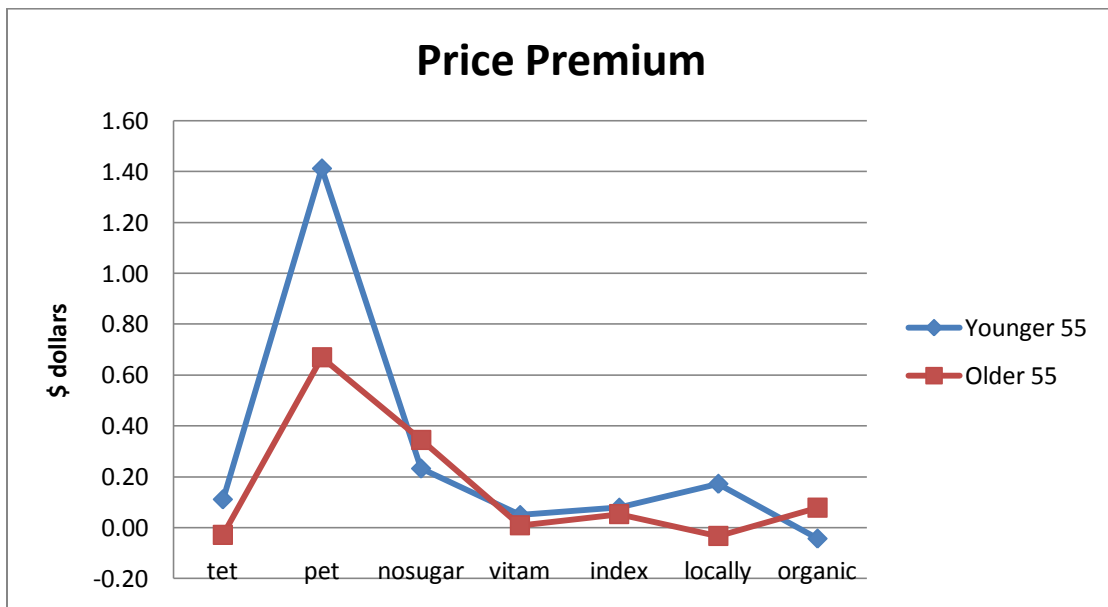
Figure 10. Willingness to Pay Age Group

CHAPTER V. CONCLUSIONS

With the increased importance of health and nutrition, changing life styles and higher incomes, the U.S. food market offers numerous opportunities for new products and product modifications. Today's trends for healthy eating habits and "ready-to-eat" products have increased consumer demand for more detailed and accessible information, primarily on food packaging and labels. Although product attributes such as quality and price are extremely important to consumers and producers, packaging and labeling play a fundamental role on consumer's intention to purchase. These factors are important because they represent the first line of contact between the consumer and the product.

Determining which packaging and labeling attributes are most significant to the consumer is essential before launching a product. In the case of 100% fruit juices, packaging and labeling can predispose the consumer to buy the product. In order to get an advantage in this competitive market, food manufacturers and marketers need to understand the consumer's decision process before introducing the product into the market.

The purpose of this study was to develop a better understanding of consumer preferences for 100% fruit juices packages and labels. To evaluate which types of packaging and labeling will be more attractive to the adult market, and to examine the attributes influencing consumer's intention to purchase as well as the factors that affect these preferences. Specifically, the objectives were to: (1) investigate which packaging and labeling attributes U.S. consumers consider important when choosing 100% fruit juices, (2) to estimate consumer's willingness-to-pay for those attributes, (3) and to identify market segments based on consumers preferences, behavior, attitudes, interests and beliefs, and analyzed the differences between the segments.

61

To accomplish these objectives, a survey was collected from approximately 253 households in the U.S. through a web survey. The survey was divided into four sections. The first section includes questions regarding fruit juice consumption. The second section involves a series of variables regarding consumer psychographics lifestyles, attitudes, and behaviors. The third section examines the conjoint hypothetical profiles, and the last section contains the socioeconomic and demographic variables. Factor analysis and a median split technique were used to divide the sample in different segments. A conditional logit model was used to analyze the data for a choice-based conjoint experiment and to estimate relative of importance and willingness-to-pay for the different attributes.

Results from descriptive statistics for the survey indicated that 68.4% of the respondents reported they consume fruit juice at least once a week. The majority stated they consumed fruit juice at home, and usually with breakfast. They prefer orange juice over other fruit juices. Other individual characteristics measured included attitude and behavior toward health, diet, price, environmental issues, if they like to try new products, if they used information on the label, usage of convenience products, and time pressure. Approximately 81 percent of respondents reported that they check the prices, and used coupons at the grocery store. More than 70 percent of respondents value product information and care about health. More than half of the respondents reported they use ready to eat products, purchased diet food and recycled goods. At least 70 percent of the sample said they will try new products, and 49 percent of the respondents indicate that they have a busy life.

Results from the CL model suggest that consumers distinguished between competing claims and logos. They place positive values and are willing to pay a premium price of $1.04 for the Polyethylene Terephthalate (PET) bottle, and $0.29 more for the no sugar added products.

The choice of the product is heavily influenced by the material of the package, in particular beverage packages, because they cannot be distributed without a container (Van Dam and Van Trijp, 1993). Consumers in this sample tended to respond to a marketing label with a diet claim, rather than nutritional information, such as the Vitamin C or a nutritional index. These findings are consistent with an International Food Information Council Foundation survey conducted in 2007, which reported that consumers are very concerned with the amount of sugar they consume and used this information above vitamin and minerals when reading labels and nutritional facts. The other attribute variables were not significant in the model.

Because the CL model uses the characteristics of the alternative choices to predict the selection, it is more challenging to include personal characteristics in the model. In order to investigate how choices vary across respondent's characteristics, the data was divided into different subgroups, based on individual characteristics and demographics. Factor analysis and a median split technique were used to define the subgroups and applied the conditional model to see if there are differences between consumer's choices and their attitudes and behaviors

Each group was run separately using the same CL analysis. Log likelihood tests were performed to examine differences between estimates for the subgroups. From the results of the CL analysis, environmentally conscious respondents, information seekers, and age were significant in explaining differences across market segments. Consumers with high environment interests were more likely to pay a premium for a fruit juice with organic ingredients and a nutritional index on the label. However, they will not pay a premium for locally produced or a 100% vitamin C claim.

Notable differences in the information seekers segment was for the attribute of locally produced, consumers who usually don't read label consider locally produced products more

important than high information seekers. High information seekers prefer the nutritional index and are willing to pay $0.13 more, compared to the $0.05 that low information seeker will pay. This last group preferred the "No Sugar Added" product. Older people (over 55 years old) are willing to pay $0.35 more for a "No Sugar Added" product, compared to younger people (less 55 years old) that will pay $0.23. In contrast, younger people are willing to pay more for local products than older people. They also will pay more than double ($1.41) of what older people will pay ($0.67) for a PET bottle.

1. **Implications**

The results obtained from this study can provide valuable information to fruit juice producers and marketers about consumer attitudes towards fruit juice packaging and labeling. Consumers in general do use label claims as a source of information when purchasing food products. However, the type of package proved to be the most important attribute when making choice decisions. Consumers will pay a higher premium for PET bottles. Marketers should focus on creating and improving packages, with environmental materials and convenient to carry.

This study also showed that consumers are willing to pay a premium for the "No Sugar Added" products. U.S. consumers tended to place a higher level of utility when the benefit will lead to a nutritional aspects rather than a healthy attribute. Marketers should highlight this information on advertising campaigns.

Even though the market for organic products is small, an important task for organic producers is to increase consumer's knowledge of the benefits of consuming these products. Another important finding that marketers and managers should be focusing on are those segments that value the benefits of organic ingredients. Environmentally conscious people in our study were interested not only in organic products, but also in the nutritional index. Creating a

mix of this kind of information will give producers an advantage over the competitors. Younger people with higher levels of education demonstrate to be more interested in organic products. Marketing campaigns direct to this fraction of the population should be addressed, to create new food habits. Almost 70% of the sample state that they drink fruit juices at least one a week. Increasing the distribution channels by adding fruit juices in vending machines in schools, gyms, offices, and places where people usually spend more of their time and usually are in a hurry will increase the demand of this product.

2. Limitations and Future Research

One limitation of the study was number of responses, because economics constraints we could only afford 253 responses, which is a relative low number to run different models such as mixed logit which has been proved to obtain better results when analyzing the data compared to the CL, because it relaxed the IIA assumption.

The other limitation was that most of the respondents in the present study were older and more educated compared to the U.S. sample base on the 2000 Census. Future research could stratify the sample according to select demographic variables. Another limitation was that respondents saw only half of the choice sets evaluated in the study, because of the length of the survey, and because respondent fatigue increase as the number of alternatives increase (Louviere, Hensher, and Swait 2000).

This study could be conducted on a larger scale to test whether or not similar preferences for fruit juices hold. Because package was the most important attribute, another study focusing only on packaging attributes could provide more specific characteristics consumer will be willing to pay such as background color, shape, sealable. Future research could focuses also only on

label attributes for fruit juices, showing consumers only one package could increase consumer's

attention to other attributes in the label.

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APPENDIX A. DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS COMPARED TO US POPULATION

Variable	Sample %	United States
Region		
Northeast	24.5	No Data
Midwest	21.7	Available
South (Median)	32.0	
West	21.7	
Gender		
Male	46.2	49.0
Female (Median)	53.8	51.0
Marital Status		
Single (divorce, widowed)	36.0	45.6
Married (Median)	64.0	54.4
Number children(under 18) living house		
0 (Median)	64.8	
1	14.2	No Data
2	15.0	Available
3	4.7	
More 5	1.2	
Age		
18 to 24	4.3	13
25 to 34	12.3	19
35 to 44	20.6	21.5
45 to 54 (Median)	25.3	8
55 to 64	26.1	11.6
65 years and over	11.5	16.7
Ethnic Background		
White/Caucasian (Median)	83.3	75.1
Hispanic	7.9	8
Asian	3.6	3.6
Other	1.2	13.3
Education		
Less than High School	2.4	19.6
High school/GED	19.8	28.6
Technical College/ Some College (Median)	39.1	27.3
Bachelors Degree	24.9	15.5
Masters/Doctoral Degree	13.9	8.9

Note: Demographic characteristics of United States are from U.S. Census Bureau, Census 2000.

Variable	Sample %	United States
Income		
Less than $10,000	8.3	9.5
$10,000 to $14,999	5.5	6.3
$15,000 to $24,999	8.7	12.8
$25,000 to $34,999	11.1	12.8
$35,000 to $49,999 (Median)	18.2	16.5
$50,000 to $74,999	24.1	19.5
$75,000 to $99,999	11.5	10.2
$100,000 to $149,999	7.1	7.7
$150,000 to $199,000	2.8	2.2
$200,000 or more	2.8	2.4

Note: Demographic characteristics of United States are from U.S. Census Bureau, Census 2000.

APPENDIX B. SUMMARY STATISTICS OF INDIVIDUAL CHARACTERISTICS (PERCENTAGES)

Variable	Strongly Disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree
To me product information is of high importance. I need to know what the food product contains.	1.6	4.0	13.8	44.3	36.6
I compare product information labels to decide which brand to buy.	3.2	8.3	20.2	43.1	25.3
I compare labels to select the most nutritious food.	4.0	7.9	20.2	43.5	24.5
I notice when products I buy regularly change in price.	0.4	4.0	11.9	43.9	39.9
I look for ads coupons in the newspaper and plan to take advantage of them when I go shopping.	4.0	9.9	19.0	30.4	36.8
I find myself checking the prices in the grocery store even for small items.	2.0	4.7	9.9	44.3	39.1
We use a lot of ready-to-eat foods in our household.	14.6	20.9	28.5	24.9	11.1
Frozen foods account for a large part of the food products I use in our household.	11.5	23.7	28.5	27.7	8.7
I use a lot of mixes, for instance baking mixes and powder soups.	19.4	30.0	23.3	20.9	6.3
I try to avoid food products with additives.	3.6	9.9	40.3	28.5	17.8
I regularly do exercise.	7.5	20.9	17.8	35.6	35.6

Variable	Strongly Disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree
I often eat fruits and vegetables.	0.0	4.3	12.3	51.0	32.4
I eat red meat moderately.	3.2	7.1	21.7	51.4	16.6
I control the salt ingestion.	1.2	13.0	16.6	40.7	28.5
I take regularly health check-ups.	7.5	13.8	13.0	37.5	28.1
I prefer consuming recycled products.	8.3	10.7	43.1	28.1	9.9
I throw garbage in selective containers.	5.9	16.6	12.3	38.7	26.5
I have switched products for ecological reasons.	9.5	22.9	34.0	24.5	9.1
I try to find the balance between work and my private life.	2.8	3.2	26.5	46.6	20.9
I always seem to be in a hurry.	9.1	20.2	30.8	26.1	13.8
Menu planning and food shopping take quite a bit of my time.	5.9	24.5	32.8	28.1	8.7
I eat diet food at least one meal a day.	23.7	30.0	20.9	20.9	4.3
I buy more low calorie food than the average person.	17.8	25.3	24.9	23.7	8.3
I often choose food/beverage because they contribute to weight control.	15.4	16.6	29.2	30.0	8.7

Variable	Strongly Disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree
I am the kind of person who would try any new product once.	3.6	11.1	23.3	46.6	15.4
When I see a new brand on the shelf, I often buy it just to see what it's like.	8.7	18.6	28.5	36.0	8.3
I like the challenge of doing something I have never done before.	2.8	8.3	28.9	44.3	15.8
I have at least one meal away from home. (Daily)	24.9	28.9	13.8	20.6	11.9

Note: Total observations = 253.

APPENDIX C. FRUIT JUICE CONSUMPTION

Variable	Frequency	Percentage
How often do you drink fruit juices?		
Never	10	4.0%
Less than once a month	35	13.8%
1-3 times a month	35	13.8%
Once a week	27	10.7%
2-3 times a week	67	26.5%
4-5 times a week	35	13.8%
More than 5 times a week	44	17.4%
Where do you consume the majority of juice?		
Away from home	31	12.3%
At home	222	87.7%
I usually drink fruit juice _____ .		
With breakfast	123	48.6%
As a snack	7	28.1%
After exercise	5	2.0%
With a meal	38	15.0%
Other	16	6.3%
I prefer _____ juice.		
Orange	26	49.8%
Grape	22	8.7%
Apple	26	10.3%
Cranberry	31	12.3%
Pineapple	7	2.8%
Tropical Mix	28	11.1%
Other	13	5.1%

Note: Total observations = 253.

APPENDIX D. CHOICE SET DESIGN AND PERCENTAGE CHOICE DECISION

Choice Set	Alternative 1	Alternative 2	Alternative 3
1	Can 100% Vitamin C - - $0.80 **(46.1%)**	Pet Bottle Nutritional Index Locally Produced Organic $1.20 **(29.7%)**	I would not buy either product to the left **(24.2%)**
2	Pet Bottle No sugar added - Organic $1.20 **(82.8%)**	Tetra-brick - - - $1.60 **(7%)**	I would not buy either product to the left **(10.2%)**
3	Tetra-brick 100% Vitamin C Locally Produced - $1.20 **(44.5%)**	Can Nutritional Index Locally Produced Organic $1.60 **(23.4%)**	I would not buy either product to the left **(32%)**
4	Tetra-brick 100% Vitamin C - Organic $1.20 **(17.2%)**	Tetra-brick No sugar added Locally Produced - $0.80 **(60.9%)**	I would not buy either product to the left **(21.9%)**
5	Tetra-brick - Locally Produced Organic $0.80 **(5.2%)**	Tetra-brick No sugar added - Organic $1.60 **(22.4%)**	I would not buy either product to the left **(26.4%)**

Choice Set	Alternative 1	Alternative 2	Alternative 3
6	Can	Pet Bottle	I would not
	-	100% Vitamin C	buy either
	-	Locally Produced	product to
	-	-	the left
	$1.20	$1.60	
	(17.6%)	**(57.6%)**	**(24.8%)**
7	Pet Bottle	Tetra-brick	I would not
	-	Nutritional Index	buy either
	Locally Produced	-	product to
	Organic	-	the left
	$1.20	$1.20	
	(72.8%)	**(14.4%)**	**(12.8%)**
8	Can	Pet Bottle	I would not
	No sugar added	Nutritional Index	buy either
	Locally Produced	-	product to
	-	-	the left
	$1.20	$0.80	
	(11.2%)	**(78.4%)**	**(10.4%)**
9	Can	Pet Bottle	I would not
	100% Vitamin C	Nutritional Index	buy either
	Locally Produced	-	product to
	Organic	Organic	the left
	$1.60	$1.20	
	(13%)	**(72%)**	**(15%)**

Notes: In parenthesis percentage of people choosing that option.

A SURVEY OF

Consumer Attitudes Concerning 100% Fruit Juices

Louisiana State University

LSU AgCenter
Research & Extension

Welcome! Thank you for agreeing to take our survey. We are an academic group in the Department of Agricultural Economics at Louisiana State University AgCenter, and we are very interested in your input about fruit juice packaging and labeling.

Today the majority of fruit juice companies are targeting children; however there remain a need for a nutritional drink for the adult.

The purpose of this survey is to evaluate which type of packaging and labeling will be more convenient and attractive for this market, in terms of the attributes influencing consumer's intention to purchase as well as the factors that affect your preferences.

There is no right or wrong answer. Your opinion is what matters to us. Your answers are completely confidential, and we will not connect you to your responses in any way. Thank you in advance for your help with our research project.

Section I. Consumption Fruit Juices

How often do you drink fruit juices?
- Never
- Less than once a month
- 1-3 times a month
- Once a week
- 2-3 times a week
- 4-5 times a week
- More than 5 times a week

Where do you consume the majority of juice?
- Away from home
- At home

I usually drink fruit juice _____.

○ With breakfast

○ As a snack

○ After exercise

○ At the gym

○ With a meal

○ Other [   ]

I prefer _____ juice.

○ Orange

○ Grape

○ Apple

○ Cranberry

○ Pineapple

○ Tropical Mix

○ Other [   ]

Section II. Consumer lifestyle, beliefs, and attitudes

Please read the following statements carefully and indicate the response that most nearly reflect your opinion

	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
To me product information is of high importance. I need to know what the food product contains.	○	○	○	○	○
I compare product information labels to decide which brand to buy.	○	○	○	○	○
I compare labels to select the most nutritious food.	○	○	○	○	○
I notice when products I buy regularly change in price.	○	○	○	○	○
I look for ads coupons in the newspaper and plan to take advantage of them when I go shopping.	○	○	○	○	○
I find myself checking the prices in the grocery	○	○	○	○	○

Please read the following statements carefully and indicate the response that most nearly reflect your opinion

	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
store even for small items.					
We use a lot of ready-to-eat foods in our household.	○	○	○	○	○
Frozen foods account for a large part of the food products I use in our household.	○	○	○	○	○
I use a lot of mixes, for instance baking mixes and powder soups.	○	○	○	○	○
I try to avoid food products with additives.	○	○	○	○	○
I regularly do exercise.	○	○	○	○	○
I often eat fruits and vegetables.	○	○	○	○	○
I eat red meat moderately.	○	○	○	○	○
I control the salt ingestion.	○	○	○	○	○
I take regularly health check-ups.	○	○	○	○	○
I prefer consuming recycled products.	○	○	○	○	○
I throw garbage in selective containers.	○	○	○	○	○
I have switched products for ecological reasons.	○	○	○	○	○
I try to find a balance between work and my private life.	○	○	○	○	○
Menu planning and food shopping take quite a bit of my time.	○	○	○	○	○
I have use diet foods at least one meal a day.	○	○	○	○	○
I buy lower calorie food than the average people.	○	○	○	○	○
I often choose food/beverage because they contribute to weight control.	○	○	○	○	○
I am the kind of person who would try any new product once.	○	○	○	○	○
When I see a new brand on the shelf, I often buy it just to see what it's like.	○	○	○	○	○
I like the challenge of doing something I have never done before.	○	○	○	○	○
I have at least one meal away from home.	○	○	○	○	○

Section III. Introduction to Conjoint Analysis

We are trying to assess the optimal combination of packaging, labeling and price attributes for 100% fruit juices.

Please focus on packaging, labeling and price only – the fact the product is grape juice should not influence you choice. All the containers have the same amount of content 12 oz.

On the following screens, you will be presented with a series of choices, each with three options.

Two of the choices include front label claims presented on different packages types, at different prices.

The third choice indicates no preference between choice A and B.

Please indicate which type of packaging, labeling and price will be more convenient and attractive to you, in terms of the attributes influencing your intention to purchase.

The package levels are:
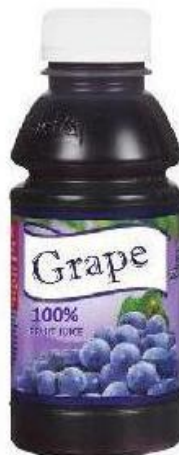
Tetra-Brick   PET Bottle   Can

The price levels are:

$0.80 (Base Price)

$1.20 (50% Premium), which means 50% more than the $0.80 (Base)

$1.60 (100% Premium), which means 100% more than the $0.80 (Base)

If you prefer an organic or a non organic product

If you prefer a fruit juice produced locally. This means that the main ingredient of the fruit juice was grown or produced within 100 miles from the point of purchase. Local producers argue that a product produce locally is fresh, more nutritious and also environmentally friendly since supermarkets will be using less fuel.

What type of Nutritional Information you prefer on the label:

Nutritional information regarding sugar content, means that no extra sugar was added

Nutritional information regarding Vitamin C content, means 100% of the recommended daily intake

Overall Nutritional Index, is a nutritional rating system which converts nutritional information into a single score on a scale of 1-100. The higher the value, the more nutritious the food is. It attempt to simplify food choices.

Option 1. Choice Based Conjoint Analysis

Please indicate the option that you would select if these products were made available to you in the marketplace. (Select one)

I would not buy either product to the left

○   ○   ○

Please indicate the option that you would buy if these products were made available to you in the marketplace. (Select one)

I would not buy either product to the left

○   ○   ○

90

Please indicate the option that you would buy if these products were made available to you in the marketplace. (Select one)

$1.20
50% ABOVE BASE PRICE

$1.60
100% ABOVE BASE PRICE

I would not buy either product to the left

○   ○   ○

Please indicate the option that you would buy if these products were made available to you in the marketplace. (Select one)

$1.20
50% ABOVE BASE PRICE

$0.80
BASE PRICE

I would not buy either product to the left

○   ○   ○

Option 2. Choice Based Conjoint Analysis

Please indicate the option that you would buy if these products were made available to you in the marketplace. (Select one)

Grape 100% FRUIT JUICE — USDA ORGANIC — LOCAL FOOD 100 MILES

$0.80
BASE PRICE

Grape 100% FRUIT JUICE — USDA ORGANIC — No Sugar Added — LOCAL FOOD 100 MILES

$1.60
100% ABOVE BASE PRICE

I would not buy either product to the left

○   ○   ○

Please indicate the option that you would buy if these products were made available to you in the marketplace. (Select one)

GRAPE 100% FRUIT JUICE

$1.20
50% ABOVE BASE PRICE

Grape 100% FRUIT JUICE — 100% Vitamin C — LOCAL FOOD 100 MILES

$1.60
100% ABOVE BASE PRICE

I would not buy either product to the left

○   ○   ○

Please indicate the option that you would buy if these products were made available to you in the marketplace. (Select one)

Grape
100%
FRUIT JUICE

$1.20
50% ABOVE BASE PRICE

Grape
100%
FRUIT JUICE
93

$1.20
50% ABOVE BASE PRICE

I would not buy either product to the left

○   ○   ○

Please indicate the option that you would buy if these products were made available to you in the marketplace. (Select one)

GRAPE
100%
FRUIT JUICE
No Sugar Added

$1.20
50% ABOVE BASE PRICE

Grape
100%
FRUIT JUICE
93

$0.80
BASE PRICE

I would not buy either product to the left

○   ○   ○

Section IV. Demographics

In what region do you live?

○ Northeast

○ Midwest

○ South

○ West

What is your gender?

○ Male

○ Female

What is your current status?

○ Single

○ Married

How many children (under the age of 18) are currently living in your house?

◉ 0

○ 1

○ 2

○ 3

○ 4

○ 5 or More

Which of the following best describes your age category in years?

◉ 18 to 24

○ 25 to 34

○ 35 to 44

○ 45 to 54

○ 55 to 64

○ 65 years and over

Which of the following best describes your ethnic background?

○ White/Caucasian

○ African American

○ Hispanic

○ Asian

○ Other

What is the highest level of education you have completed?

○ Less than High School

○ High School / GED

○ Technical College

○ Some College

○ Bachelor Degree

○ Master's Degree

○ Doctoral Degree

Which of the following best describes your annual income?

○ Less than $10,000

○ $10,000- $14,999

○ $15,000 - $24,999

○ $25,000 - $34,999

◉ $35,000 - $49,999

○ $50,000 - $74,999

○ $75,000 - $99,000

○ $100,000 - $149,999

◉ $150,000 - $199,999

○ $200,000 or more

APPENDIX H. FACTOR ANALYSIS

Factor 1 = Diet Product Users

I have use diet foods at least one meal a day.

I eat more low calorie food than the average person.

I often choose food/beverage because they contribute to weight control

Factor 2 = Information Seeker

To me product information is of high importance. I need to know what the food product contains.

I compare product information labels to decide which brand to buy.

I compare labels to select the most nutritious food.

Factor 3 = Price Conscious

I notice when products I buy regularly change in price.

I look for ads coupons in the newspaper and plan to take advantage of them when I go shopping.

I find myself checking the prices in the grocery store even for small items.

Factor 4 = New Product Tryer

I am the kind of person who would try any new product once.

When I see a new brand on the shelf, I often buy it just to see what it's like.

I like the challenge of doing something I have never done before.

Factor 5 = Environmentally Conscious

I prefer consuming recycled products.

I throw garbage in selective containers.

I have switched products for ecological reasons.

Factor 6 = Convenience Product User

We use a lot of ready-to-eat foods in our household.

Frozen foods account for a large part of the food products I use in our household.

I use a lot of mixes, for instance baking mixes and powder soups.

I have at least one meal away from home. (Daily)

I always seem to be in a hurry.

Menu planning and food shopping take quite a bit of my time.

Factor 7 = Health Conscious

I try to avoid food products with additives.

I often eat fruits and vegetables.

I eat red meat moderately.

I control the salt ingestion.

I regularly do exercise.

I take regularly health check-ups.

APPENDIX I. SUBGROUPS DEMOGRAPHIC CHARACTERISTICS (PERCENT)

Variable	High Diet Product Users	Low Diet Product Users	High Price Sensitive	Low Price Sensitive	High Environment Conscious	Low Environment Conscious
Region						
Northeast	25.4	23.7	21.1	27.7	23.1	25.2
Midwest	25.4	18.3	22.0	21.5	28.7	16.6
South	27.9	35.9	39.0	25.4	27.8	35.2
West	21.3	22.1	17.9	25.4	20.4	22.8
Gender						
Male	47.5	45.0	39.8	52.3	48.1	44.8
Female	52.5	55.0	60.2	47.7	51.9	55.2
Marital Status						
Single (divorce, widowed)	33.6	38.2	30.9	40.8	34.3	37.2
Married	66.4	61.8	69.0	59.2	65.7	62.8
Number children(under 18) living house						
0	63.9	65.6	62.6	66.9	66.7	63.4
1	12.3	16.0	12.2	16.2	13.0	15.2
2	17.2	13.0	16.3	13.8	12.0	17.2
3	5.7	3.8	7.3	2.3	7.4	2.8
More 5	0.8	1.5	1.6	0.8	0.9	1.4
Age						
18 to 24	2.5	6.1	3.3	5.4	6.5	2.8
25 to 34	17.2	7.6	8.9	15.4	14.8	10.3
35 to 44	20.5	20.6	21.1	20.0	22.2	19.3
45 to 54	23.8	26.7	26.8	23.8	23.1	26.9
55 to 64	25.4	26.7	26.8	25.4	25.9	26.2
65 years and over	10.7	12.2	13.0	10.0	7.4	14.5

Variable	High Diet Product Users	Low Diet Product Users	High Price Sensitive	Low Price Sensitive	High Environment Conscious	Low Environment Conscious
Ethnic Background						
White/Caucasian	82.9	84.7	87.8	80.0	79.6	86.9
African American	4.9	10.7	7.3	8.5	9.3	6.9
Hispanic	5.7	1.5	4.1	3.1	5.6	2.1
Asian	4.9	2.3	0.8	6.2	5.6	2.1
Other	1.6	0.8	0.0	2.3	0.0	2.1
Education						
Less than High School	4.1	0.8	0.8	3.8	1.9	2.8
High school/GED	14.8	24.4	23.6	16.2	13.9	24.1
Technical College	9.0	7.6	8.1	8.5	8.3	8.3
Some College	26.2	35.1	30.9	30.8	27.8	33.1
Bachelors Degree	24.6	25.2	25.2	24.6	27.8	22.8
Masters Degree	18.9	5.3	9.8	13.8	17.6	7.6
Doctoral Degree	2.5	1.5	1.6	2.3	2.8	1.4
Income						
Less than $10,000	4.1	12.2	8.9	7.7	9.3	7.6
$10,000 to $14,999	7.4	3.8	6.5	4.6	6.5	4.8
$15,000 to $24,999	9.8	7.6	8.1	9.2	4.6	11.7
$25,000 to $34,999	5.7	16.0	14.6	7.7	10.2	11.7
$35,000 to $49,999	18.9	17.6	17.9	18.5	18.5	17.9
$50,000 to $74,999	23.0	25.2	25.4	23.1	21.3	26.2
$75,000 to $99,999	11.5	11.5	11.4	11.5	13.9	9.7
$100,000 to $149,999	10.7	3.8	4.9	9.2	7.4	6.9
$150,000 to $199,000	4.1	1.5	0.0	5.4	3.7	2.1
$200,000 or more	4.9	0.8	2.4	3.1	4.6	1.4

Variable	High Info. Seekers	Low Info. Seekers	High New Product Trier	Low New Product Trier	High Convenience Product User	Low Convenience Product User	High Health Conscious	Low Health Conscious
Region								
Northeast	19.4	27.5	23.7	25.0	22.0	26.9	21.8	25.9
Midwest	24.7	20.0	23.7	20.5	26.0	17.7	24.1	20.5
South	38.7	28.1	32.0	32.1	32.5	31.5	32.2	31.9
West	17.2	24.4	20.6	22.4	19.5	23.5	21.8	21.7
Gender								
Male	44.1	47.5	40.2	50.0	46.3	46.2	47.1	45.8
Female	55.9	52.5	59.8	50.0	53.7	53.8	52.9	54.2
Marital Status								
Single (divorce, widowed)	37.6	35.0	35.1	36.5	38.2	33.8	31.0	38.6
Married	62.4	65.0	64.9	63.5	61.8	66.2	69.0	61.4
Number children(under 18) living house								
0	66.7	63.8	63.9	65.4	53.7	75.4	66.7	63.9
1	16.1	13.1	12.4	15.4	16.3	12.1	13.8	14.5
2	9.7	18.1	15.5	14.7	20.3	10.0	10.3	17.5
3	5.4	4.4	8.2	2.6	8.1	1.5	6.9	3.6
More 5	2.2	0.6	0.0	1.9	1.6	0.8	2.3	0.6
Age								
18 to 24	5.4	3.8	5.2	3.8	4.9	3.8	3.4	4.8
25 to 34	11.8	12.5	14.4	10.9	17.9	6.9	13.8	11.4
35 to 44	22.6	19.4	26.8	16.7	23.6	17.7	19.5	21.1
45 to 54	23.7	26.3	26.8	24.4	22.8	27.7	23.0	26.5
55 to 64	24.7	26.9	19.6	30.1	24.4	27.7	26.4	25.9
65 years and over	11.8	11.3	7.2	14.1	6.5	16.2	13.8	10.2

Variable	High Info. Seekers	Low Info. Seekers	High New Product Trier	Low New Product Trier	High Convenience Product User	Low Convenience Product User	High Health Conscious	Low Health Conscious
Ethnic Background								
White/Caucasian	83.9	83.8	81.4	85.3	82.1	85.4	75.9	88.0
African American	9.7	6.9	7.2	8.3	7.3	8.5	10.3	6.6
Hispanic	5.4	2.5	7.2	1.3	4.9	2.3	8.0	1.2
Asian	1.1	5.0	4.1	3.2	5.7	1.5	5.7	2.4
Other	0.0	1.9	0.0	1.9	0.0	2.3	0.0	1.8
Education								
Less than High School	1.1	3.1	4.1	1.3	0.8	3.8	2.3	2.4
High school/GED	19.4	20.0	19.6	19.9	19.5	20.0	17.2	21.1
Technical College	9.7	7.5	8.2	8.3	9.8	6.9	8.0	8.4
Some College	32.3	30.0	29.9	31.4	24.4	36.9	25.3	33.7
Bachelors Degree	22.6	26.3	20.6	27.6	28.5	21.5	26.4	24.1
Masters Degree	11.8	11.9	14.4	10.3	16.3	7.7	18.4	8.4
Doctoral Degree	3.2	1.3	3.1	1.3	0.8	3.1	2.3	1.8
Income								
Less than $10,000	7.5	8.8	7.2	9.0	5.7	10.8	6.9	9.0
$10,000 to $14,999	8.6	3.8	7.2	4.5	6.5	4.6	6.9	4.8
$15,000 to $24,999	6.5	10.0	5.2	10.9	8.1	9.2	6.9	9.6
$25,000 to $34,999	7.5	13.1	11.3	10.9	13.0	9.2	6.9	13.3
$35,000 to $49,999	21.5	16.3	18.6	17.9	16.3	20.0	20.7	16.9
$50,000 to $74,999	23.7	24.4	21.6	25.6	24.4	23.8	24.1	24.1
$75,000 to $99,999	12.9	10.6	12.4	10.9	13.0	10.0	13.8	10.2
$100,000 to $149,999	5.4	8.1	8.2	6.4	6.5	7.7	5.7	7.8
$150,000 to $199,000	2.2	3.1	4.1	1.9	3.3	2.3	3.4	2.4
$200,000 or more	4.3	1.9	4.1	1.9	3.3	2.3	4.6	1.8

APPENDIX J. COMPARING COEFFICIENT ESTIMATES FOR VARIOUS GROUPS OF RESPONDENTS

Subgroups	Log Likelihood Function	Chi-Square Statistics	Results
Sample Data	-898.5		
Diet Product User			
Low	-455.94	-10.12	Fail to reject Ho
High	-437.50		
Price Sensitive			
Low	-475.64	-9.26	Fail to reject Ho
High	-418.23		
Environmentally Conscious			
Low	-521.32	-24.82	Reject Ho
High	-364.27		
Information Seeker			
Low	-588.63	-23.38	Reject Ho
High	-298.18		
New Product Tryer			
Low	-560.31	-9.62	Fail to reject Ho
High	-333.38		
Convenience Product User			
Low	-478.33	-12. 52	Fail to reject Ho
High	-413.91		
Health Conscious			
Low	-592.58	-3.94	Fail to reject Ho
High	-300.95		
Gender			
Male	-407.13	-6.44	Fail to reject Ho
Female	-488.15		
Age			
Younger 55	-537.12	-24.76	Reject Ho
Older 55	-348.93		
Education			
Less Bachelor	-545.05	-8.9	Fail to reject Ho
Higher Bachelor	-349.00		
Income			
Lower 50k	-472.28	-6.16	Fail to reject Ho
Greater 50K	-423.14		
Fruit Juice Consumption			
Less 3 times week	-622.76	-8.08	Fail to reject Ho
More 3 times week	-271.70		

Note: Chi square with 9 degrees of freedom = 21.67 with a significance of 0.01

APPENDIX K. CERTIFICATION OF THE NATIONAL INSTITUTES OF HEALTH (NIH)

Certificate of Completion

The National Institutes of Health (NIH) Office of Extramural Research certifies that **Tatiana Bonilla** successfully completed the NIH Web-based training course "Protecting Human Research Participants".

Date of completion: 03/31/2010

Certification Number: 426145

VITA

Tatiana Bonilla was born in February 1981, in San Jose, Costa Rica. She graduated from Universidad de Costa Rica, in March 2003, where she received the title of Bachelor in Business Management. After the completion of this degree she worked five years for British American Tobacco. The first years she worked for the department of finance as a finance junior assistant. After the first year she was promoted as team leader of two finance modules for seventeen companies that operate in Central America and the Caribbean. In 2007 she was assigned to an implementation of SAP project in Mexico. One year later she returned to Costa Rica to participate in the implementation of the same software but for the Caribbean and Central America. In August of 2008, she was admitted in the Department of Agricultural Economics and Agribusiness at Louisiana State University. Currently she is a candidate for the degree of Master of Science in agribusiness management.