

The Effect of Packaging Attributes on Consumer Perception of Cherry Juice

presented by

Audrey Michael Whaling

has been accepted towards fulfillment
of the requirements for the

**Master of
Science**

degree in

Packaging

Major Professor's Signature

8/2/07

Date

PLACE IN RETURN BOX to remove this checkout from your record.
TO AVOID FINES return on or before date due.
MAY BE RECALLED with earlier due date if requested.

DATE DUE	DATE DUE	DATE DUE
NOV 16 2009		

The Effect of Packaging Attributes on Consumer Perception of Cherry Juice

By

Audrey Michael Whaling

A THESIS

**Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of**

MASTER OF SCIENCE

Department of Packaging

2007

Abstract

The Effect of Packaging Attributes on Consumer Perception of Cherry Juice

By

Audrey Michael Whaling

Consumer views of a product are based on many characteristics of both the product and the package. The means-end theory suggests that consumers make decisions to buy according to what choice will produce the most beneficial results. In essence, a consumer will weigh the consequences of several alternatives and choose the most positive outcome for themselves.

Products communicate to consumers through attributes. Packaging, a commonly overlooked aspect of a product, plays a vital role in sending messages regarding product attributes to the consumer. Material, shape, and package design can help to project a positive and beneficial image of the product in the consumer's mind, which can translate into fulfillment of perceived needs.

The objective of this research project is to investigate the impact of packaging on consumer perception of cherry juice. Research was conducted through a series of focus groups grounded in the means-end theory, using three demographic groups; mothers, young adults and adults.

Research findings indicate attributes associated with the communication and utility functions of packaging have the most impact on consumers in all focus groups. Packaging attributes like transparency, inertness, usability, recloseability, and recyclability affected consumer perceptions about the product. Differences arose between demographic groups only in the context of the situation for which the package was being used.

Copyright by
AUDREY MICHAEL WHALING

**For Dr. Laura Bix,
my mentor, my inspiration,
and my guiding light**

Acknowledgements

I would like to take this opportunity to sincerely thank my major professor Dr. Laura Bix. She has been my mentor and motivator throughout this entire process. She took me under her wing when I was only a sophomore in college and has seen me through until the end. Her dedication, compassion, wisdom, and relentless efforts have kept me going. I aspire to one day be like her.

I would also like to thank the members of my committee, Dr. Diana Twede, Dr. Suzanne Thornsby, and Dr. Nora Rifon. Their help and support have been vital to this research.

I would like to express my extreme gratitude to the Juice Products Association the Michigan State University School of Packaging, and the Michigan State Graduate School for funding this research. I also thank MSU Packaging Alumni Association for the scholarship awarded during my program. Thank you to St. Gobain, Elo-Pack, CCL containers, and Performance Packaging, the companies who provided support of this project.

I extend a thank you to the Liz Quilliam for her help during the focus groups and to Lori Strom for her help in recruiting participants. Without their help this research would have been impossible. In addition, a big thank you to Dr. Kami Silk for taking the time to work on data analysis with me. I would also like to extend my appreciation for Linda Estill, Colleen Wager, and April Meersdom for doing the behind the scenes work.

A special thank you to Maria Paz-Gonzales, Javier de la Fuente, Josh Vincent, and Joe Fair, who have supported me through my entire program. The time and help they have volunteered has been monumental. And a HUGE thank you, Kristi Radakovic and Jessic Oniga for always being there when I needed them.

I would also like to thank to my family, who were always there to answer hysterical phone calls at all hours, bring wine and chocolate when needed, providing enthusiasm, and having endless faith in me. I owe you immensely.

Table of Contents

List of tables	ix
List of figures	x
Chapter 1: Introduction	1
I. The Means End Chain	1
II. Product Attributes	7
III. Packaging Functions as Product Attributes.....	7
i. Containment	8
ii. Protection	9
iii. Communication.....	9
iv. Utility	10
IV. The Michigan Cherry Industry	11
Chapter 2: Literature Review	16
I. Influence of Attributes	17
Chapter3: Research Methods	23
I. Objectives.....	23
II. Methods	23
i. Focus Groups	23
ii. Composition of Focus Groups	24
III. Materials	25
i. Glass Bottles	26
ii. Gable Top Cartons.....	27
iii. Polyethylene teraphthalate (PET) bottles	28
iv. Tetra brick (brick packs)	29
v. Aluminum bottles	31
vi. High Density Polyethylene (HDPE) Bottles	32
vii. Flexible Stand Up pouches	33
viii. POM Wonderful® packages	34
IV. Procedures	35
Chapter 4: Methods for Analyses	39
I. Analysis of Package Rankings	39

II. Thought Unit Analysis	39
i. Containment	41
ii. Protection	41
iii. Communication	42
iv. Utility.....	42
v. Other	43
vi. Means End Chain.....	46
III. Long table Approach.....	47
Chapter 5: Results	50
I. Package Rank Order	50
i. Glass Bottles	54
ii. Flexible Stand Up Pouches.....	54
iii. Gable Top Cartons.....	55
iv. Tetra brick (brick packs).....	55
v. High Density Polyethylene (HDPE) Bottles	56
vi. Aluminum Bottles	56
vii. Polyethylene Terephthalate Bottle	57
II. Packaging Rank Order by Demographic Group	57
III. Results of Coding.....	60
i. Containment	63
ii. Protection	64
a. Transparency, Size, etc.	64
b. Labeling	64
iv. Utility	65
a. Use	65
b. Storage.....	65
v. Other	66
IV. Focus group Discussion Findings	67
i. Containment	67
ii. Protection	68
iii. Communication	69
a. Transparency, Shape, and other features	69
b. Labeling.....	72
1. Labeling in general	73
2. Labeling for cherry juice	73
iv. Utility	74

a.	Use of the Product	74
b.	Storage	75
c.	End use	76
V.	Means End Chain For Cherry Juice	77
Chapter 6:	Discussion	81
Chapter 7:	Conclusions	87
Chapter 8:	Research Limitations	91
Chapter 9:	Future research	94
Appendix A:	Screening Questionnaire	97
Appendix B:	IRB Approval Letter and IRB Approved Moderator Guide	99
Appendix C:	Consent Forms	104
Appendix D:	Demographic Survey and Results	111
Appendix E:	Calculation of Inter-coder Reliability	116
Appendix F:	Focus Group Findings	120
Appendix G:	Diseases Associated with Aging	127
Appendix H:	Recruitment Examples	130

List of Tables

Table 1: Antioxidant Content of Highest Containing foods	12
Table 2: Composition of Focus Groups	24
Table 3: Participants who had at least tried cherry juice	24
Table 4: Coding Sheet	44
Table 5: Rank order of packages as an initial part of discussion.....	51
Table 6: Rank order of packages as a discussion of cherry juice packaging.....	51
Table 7: Frequency of best liked package as part of initial, general packaging discussion.....	52
Table 8: Frequency of best liked package after the discussion of juice packaging, with a final emphasis on cherry juice.....	52
Table 9: Significant Shifts in Rankings as indicated by Cross-tabs, chi- squared analysis using SPSS.....	54
Table 10: Frequency of best liked package as part of initial discussion by demographic group.....	58
Table 11: Thought Unit Results.....	61
Table 12: Significant differences between demographic groups in thought units as indicated by Cross-tabs, chi-squared analysis using SPSS.....	63

the first of these is the fact that the system is not a simple one, but a complex one, in which the various parts are interrelated and interdependent. The second is that the system is not a static one, but a dynamic one, in which the parts are constantly changing and evolving. The third is that the system is not a closed one, but an open one, in which the parts are constantly interacting with the environment. The fourth is that the system is not a linear one, but a non-linear one, in which the parts are constantly interacting with each other in a non-linear fashion. The fifth is that the system is not a deterministic one, but a probabilistic one, in which the parts are constantly interacting with each other in a probabilistic fashion. The sixth is that the system is not a simple one, but a complex one, in which the parts are interrelated and interdependent. The seventh is that the system is not a static one, but a dynamic one, in which the parts are constantly changing and evolving. The eighth is that the system is not a closed one, but an open one, in which the parts are constantly interacting with the environment. The ninth is that the system is not a linear one, but a non-linear one, in which the parts are constantly interacting with each other in a non-linear fashion. The tenth is that the system is not a deterministic one, but a probabilistic one, in which the parts are constantly interacting with each other in a probabilistic fashion.

List of Figures

Figure 1: A model of Consumer Problem Solving	2
Figure 2: A visual description of the Means-End Chain.....	3
Figure 3: An example of the Means End Chain for Milk.....	4
Figure 4: Evaluating the Alternatives- Product Perception.....	6
Figure 5: Glass Bottle.....	27
Figure 6: Gable Top Carton.....	28
Figure 7: Polyethylene Terephthalate Bottle.....	29
Figure 8: Tetra Brick (Brick Pack).....	31
Figure 9: Aluminum Bottle.....	32
Figure 10: High Density Polyethylene Bottle.....	33
Figure 11: Flexible Stand Up Pouch.....	34
Figure 12: POM® Wonderful Package.....	35
Figure 13: General flow of discussion for focus groups.....	38
Figure 14: Procedure for the Long Table approach.....	49
Figure 15: Means end chain for cherry juice packaging.....	78

Chapter 1 - Introduction

Packaging protects and delivers products to consumers, in addition to communicating information and facts about the product. Not only do labels and name brands convey information to the consumer, but package type and material can also play a role in sending a message about a product. As a product attribute, the package has the ability to communicate consequences of purchase and, ultimately, affect purchase intention. The message a package conveys can indicate to a consumer whether or not a product/package system will help them fulfill a goal or value they are attempting to achieve (Olson and Reynolds 2001). The relationship of product (and package attributes) to the desired end states, goals and values of a consumer is described through a model referred to as the Means End Chain.

I. The Means End Chain

Consumer values are a key factor that drives consumer behavior. Peter and Olson (2005) define values as, "people's broad life goals," which include their "preferred states of being," and "preferred modes of conduct." The human race consumes in order to meet needs, achieve goals or reach end states, at which point they seek no further fulfillment. Every day millions are spent on products in order for people to achieve these end states. A typical shopping trip (Figure 1) includes: identification of a problem and the need for a solution, finding alternative solutions to the problem, weighing of alternatives, selection of a solution, and an evaluation of the choice after selection.

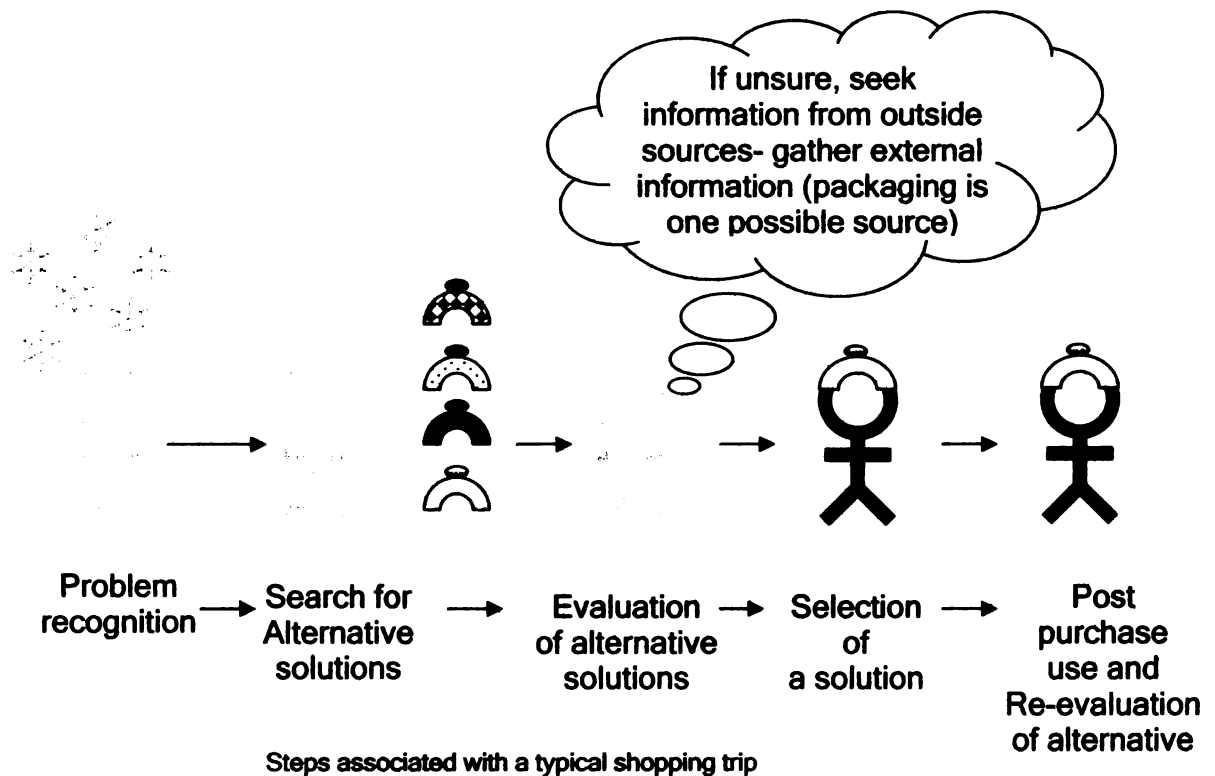


Figure 1: A model of Consumer Problem Solving

Peter and Olson (2005) define an attribute as a characteristic of a product. Characteristics can be subjective, like quality or classiness; or they can be physical, such as the material from which a product is made. Much of the time a consumer evaluates the product by evaluating attributes of that product in order to make a purchase decision. Each attribute is taken into account and weighed in

the context of a preferred end state. In this way product attributes can directly influence the way one aims to achieve values.

One way of describing the relationship between values and product attributes is the Means End Chain. Pieters et al. (1995) describes the Means End Chain as, “relationships between product attributes, consequences of product use, and consumer values.” According to the Means End Chain, consumers make decisions based on a products attributes they believe will produce outcomes (Gutman 1997). Consumers aim to maximize positive outcomes and minimize negative ones. They weigh their options, comparing each alternative and how it will affect them. They make a decision based on what choice will produce the most positive outcome. Simply, it is a theory that describes a means to an ends. Olson and Reynolds (2001) provide the following associations shown in Figure 2:

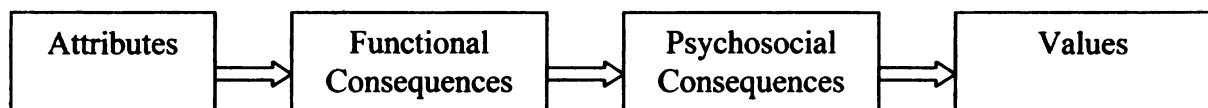


Figure 2: A visual description of the Means End Chain

A consumer begins with a problem that needs a solution (i.e. needing milk while cooking dinner). A consumer must then evaluate several different solutions for this problem and weigh the consequences of each. These consequences are either functional or psychosocial consequences (Olson and Reynolds 2001) that will result from a situation. Figure 3 shows the means end chain in action. Functional consequences include the actual use for the product, for example needing the milk to make macaroni and cheese for dinner. Psychosocial

consequences are those that have meaning to a consumer in regard to how they feel and how they believe others see them. Psychosocial consequences, for example could be the choice between whole milk and fat free milk. Choosing fat free milk may result in a person feeling healthier, and believing others see them as healthy. After evaluating alternatives and weighing all consequences, a consumer then makes the choice they see fit to best fulfill their goals.

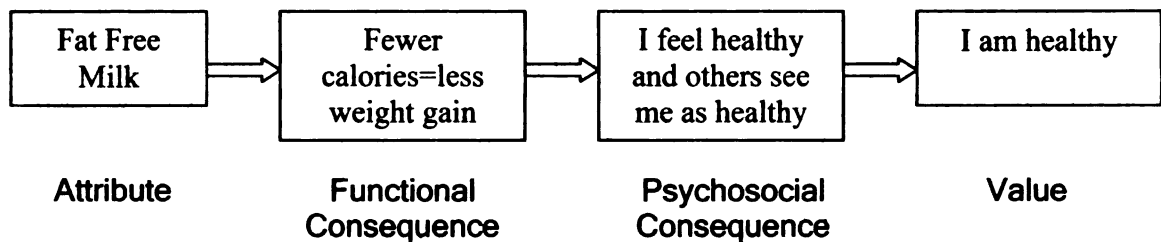


Figure 3: An Example of the Means End Chain for Milk

Product attributes evaluated by consumers consist of knowledge about the product which includes brand attributes, brand image, brand personalities, and perceptions of product (Krum and Culley 1983). How a consumer sees a product can strongly influence their beliefs about that product, and, in turn, how they see that product helping to achieve their values. Judgments and decisions about a product are often made after considering the possible benefits and costs to the consumer (Mukherjee and Hoyer 2001). A consumer who perceives a product to be positive and beneficial is more likely to consume or use it.

Product perception can be broken down further. There are two psychological responses a consumer experiences when exposed to stimuli (products). These responses are affect and cognition (Figure 4). Affect is the feeling a consumer has about a product. These feelings are most often a reaction and experienced physically. A consumer often cannot control these

feelings, and they occur with almost any type of stimulus. For example, a consumer may love the characters Snap, Crackle, and Pop of Kellogg's™ Rice Krispies cereal. This feeling is considered affect.

Cognition involves the mental processes, thoughts and ideas a consumer has about a product. These processes include understanding, evaluating, planning, deciding, and thinking (Anderson 1985), and enable consumers to interpret information they receive from the environment as well as information from their past experiences. They also allow a consumer to understand their own behavior and beliefs. And finally, not only does cognition allow consumers to interpret information, but use that information to make decisions and carry out actions to achieve goals (Peter and Olson 2005).

These responses shape perception, and in turn perception is knowledge of a product attributes. This knowledge ultimately creates a basis for consumers to use in making decisions. If the responses to products, or other stimuli, can be positively influenced, a consumer may see that product as an aid to achieve their goals and values. This may translate into intention to purchase the product (Peter and Olson 2005).

the first of these is the fact that the
the second is the fact that the
the third is the fact that the
the fourth is the fact that the
the fifth is the fact that the
the sixth is the fact that the
the seventh is the fact that the
the eighth is the fact that the
the ninth is the fact that the
the tenth is the fact that the
the eleventh is the fact that the
the twelfth is the fact that the
the thirteenth is the fact that the
the fourteenth is the fact that the
the fifteenth is the fact that the
the sixteenth is the fact that the
the seventeenth is the fact that the
the eighteenth is the fact that the
the nineteenth is the fact that the
the twentieth is the fact that the
the twenty-first is the fact that the
the twenty-second is the fact that the
the twenty-third is the fact that the
the twenty-fourth is the fact that the
the twenty-fifth is the fact that the
the twenty-sixth is the fact that the
the twenty-seventh is the fact that the
the twenty-eighth is the fact that the
the twenty-ninth is the fact that the
the thirtieth is the fact that the
the thirty-first is the fact that the
the thirty-second is the fact that the
the thirty-third is the fact that the
the thirty-fourth is the fact that the
the thirty-fifth is the fact that the
the thirty-sixth is the fact that the
the thirty-seventh is the fact that the
the thirty-eighth is the fact that the
the thirty-ninth is the fact that the
the fortieth is the fact that the
the forty-first is the fact that the
the forty-second is the fact that the
the forty-third is the fact that the
the forty-fourth is the fact that the
the forty-fifth is the fact that the
the forty-sixth is the fact that the
the forty-seventh is the fact that the
the forty-eighth is the fact that the
the forty-ninth is the fact that the
the fiftieth is the fact that the
the fifty-first is the fact that the
the fifty-second is the fact that the
the fifty-third is the fact that the
the fifty-fourth is the fact that the
the fifty-fifth is the fact that the
the fifty-sixth is the fact that the
the fifty-seventh is the fact that the
the fifty-eighth is the fact that the
the fifty-ninth is the fact that the
the sixtieth is the fact that the
the sixty-first is the fact that the
the sixty-second is the fact that the
the sixty-third is the fact that the
the sixty-fourth is the fact that the
the sixty-fifth is the fact that the
the sixty-sixth is the fact that the
the sixty-seventh is the fact that the
the sixty-eighth is the fact that the
the sixty-ninth is the fact that the
the seventieth is the fact that the
the seventy-first is the fact that the
the seventy-second is the fact that the
the seventy-third is the fact that the
the seventy-fourth is the fact that the
the seventy-fifth is the fact that the
the seventy-sixth is the fact that the
the seventy-seventh is the fact that the
the seventy-eighth is the fact that the
the seventy-ninth is the fact that the
the eightieth is the fact that the
the eighty-first is the fact that the
the eighty-second is the fact that the
the eighty-third is the fact that the
the eighty-fourth is the fact that the
the eighty-fifth is the fact that the
the eighty-sixth is the fact that the
the eighty-seventh is the fact that the
the eighty-eighth is the fact that the
the eighty-ninth is the fact that the
the ninetieth is the fact that the
the ninety-first is the fact that the
the ninety-second is the fact that the
the ninety-third is the fact that the
the ninety-fourth is the fact that the
the ninety-fifth is the fact that the
the ninety-sixth is the fact that the
the ninety-seventh is the fact that the
the ninety-eighth is the fact that the
the ninety-ninth is the fact that the
the hundredth is the fact that the

Page 100

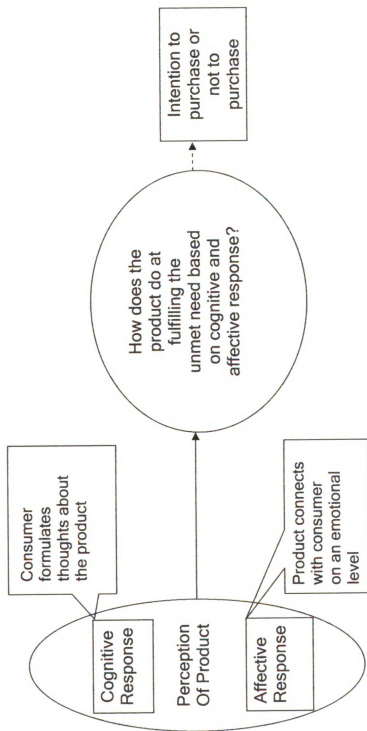


Figure 4: Evaluating the Alternatives- Product Perception

II. Product Attributes

In most situations a consumer has specific attributes they look for when purchasing a product (Fennel 1978). These attributes can range from the safety of using the product to convenience or consumer satisfaction with the product. A consumer evaluates attributes different products offer and decides which will maximize positive outcomes of the decision he or she makes. Positive outcomes are those that solve the initial problem of the consumer; those outcomes that fulfill a consumer's requirements. A product that meets and fulfills a consumer's needs may then result in a positive perception of the product.

However, consumer perspectives of products are based not just on a single attribute, but many, so it is critical to identify all of those characteristics that influence a consumer's perception of a product (Karnes 1995). Consumers buy with a list of requirements a product must fulfill, and evaluate a product based on those expectations. The requirements they look for in a product are those which will help them solve the initial problem that began their search (Olson and Reynolds 2001).

III. Packaging Functions as Product Attributes

The package is a product attribute and a key factor in influencing purchasing behavior (Jacoby and Olson 1972). If the consumer is focusing on product attributes when shopping, the package is included in those attributes. Thus, a package that sends a positive message to the consumer translates into a positive message about the product. Colors, texture, shape,

and text all make an impression on the purchaser that can influence behavior. Packaging is the first thing a consumer sees in the store and the last interaction medium before purchase (Ampuero and Vila 2006). Sending a clear message of beneficial attributes creates the idea that purchasing the product will have minimal negative consequence and satisfy consumer needs.

The package is not just a vehicle to move the product from manufacturer to market place. According to Abbott (1989) the four main functions of packaging are 1) containment, 2) protection 3) communication and 4) utility. These four functions are present in packaging, regardless of the type; and they can be further broken down to specific attributes of the package.

i. Containment

Containing a product is thought to be the original function of packaging (Abbott 1989). This includes the handling and use of the product. Imagine what would happen if a person tried to deliver a gallon of milk to his or her neighbor without the plastic jug. A package enables a product to be properly transported from one location to another.

Attributes typically associated with this function are the durability and machinability of the packaging material. It is also the design of the package and its ability to move easily through the supply chain. It can also be the package material and shape and its ability to keep the contents of the product securely inside.

ii. Protection

Most products require a barrier from hazards of the outside environment and a means to preserve product properties. Contamination, alteration, and tampering are all things that may occur to a product, and it is the packages' duty to prevent this from occurring (Abbott 1989). Oxidation, photo degradation, and changes that result from temperature fluctuations may be detrimental to the product's properties. The package must protect the product and retain its quality until the end of its stated shelf life. As a result, the shelf life of a product is highly dependent on the properties of the package.

Attributes associated with this function are the material of the package and its ability to withstand environmental conditions that include temperature fluctuations, migration, or hazards that may puncture or break the package. Other attributes associated with this function include the ability to prevent tampering by outsiders or chemical reactions resulting from outside factors.

iii. Communication

Communication includes product labeling, branding, information about the product, as well as unspoken information the consumer interprets themselves. Attention to a package is determined both by the properties of the package itself and by factors that rest in the consumers past experiences (Nasalroad 1992). A consumer adds what the package communicates to his or her existing knowledge and formulates a perception of the product. Consumers evaluate the benefits they believe they will receive from purchasing a particular type of package/product system. If the package can

evoked a thought of benefit and a positive feeling, the more willing a consumer is to buy it. It has been stated that your package becomes your product (Fox 1987) and it appears at the point where the peak in the decision-making process occurs (Peters 1994).

Attributes associated with packaging communication include the size, shape, and type of package. The transparency or opacity of a package can signal information about the product; a transparent package can give the consumer a better understanding of the contents while consumers need to draw their own conclusions about an opaque package. Size and shape are also attributes that likely influence purchase behavior. In addition, any labeling, graphics, or messages that are present on a package fall into this category. A consumer that is shopping for fat free milk needs the package to communicate what he or she is looking for. Messages that indicate a greater value can also influence a consumer's purchase intentions.

iv. Utility

Utility is the package's ability to aid in the use or dispensing of the product (Abbott 1989). This includes the opening, closing, reuse, storage and disposal, among other actions performed while using a package. Many times packages are created with "easy to use" features like a pull tab for soda pop or a specially designed handle for laundry detergent. Attributes typically associated with this function of packaging are features of the package that aid in its use, storage or disposal. A package made of a specific material that is easy to recycle has an attribute that also falls into this function category.

the first of these is the fact that the
the second is the fact that the
the third is the fact that the
the fourth is the fact that the
the fifth is the fact that the

the sixth is the fact that the
the seventh is the fact that the
the eighth is the fact that the
the ninth is the fact that the
the tenth is the fact that the
the eleventh is the fact that the
the twelfth is the fact that the
the thirteenth is the fact that the
the fourteenth is the fact that the
the fifteenth is the fact that the
the sixteenth is the fact that the
the seventeenth is the fact that the
the eighteenth is the fact that the
the nineteenth is the fact that the
the twentieth is the fact that the

the twenty-first is the fact that the
the twenty-second is the fact that the
the twenty-third is the fact that the
the twenty-fourth is the fact that the
the twenty-fifth is the fact that the
the twenty-sixth is the fact that the
the twenty-seventh is the fact that the
the twenty-eighth is the fact that the
the twenty-ninth is the fact that the
the thirtieth is the fact that the

the thirty-first is the fact that the
the thirty-second is the fact that the
the thirty-third is the fact that the
the thirty-fourth is the fact that the
the thirty-fifth is the fact that the
the thirty-sixth is the fact that the
the thirty-seventh is the fact that the
the thirty-eighth is the fact that the
the thirty-ninth is the fact that the
the fortieth is the fact that the

IV. The Michigan Cherry Industry

The Michigan cherry industry has a need to develop packaging for its products that is more focused on end-user purchasing in order to expand its market. Currently, Michigan produces about 70-75% of the total tart cherry crop in the USA, about 250 million pounds out of a total 350 million pounds nationwide (Michigan Department of Agriculture 2006). In 2003, Michigan's production of red tart cherries was 154 million pounds, grossing more than \$57 million dollars (USDA/NASS 2005).

However, profits have experienced a decline due to global competition, mainly from Poland. Poland's share of tart cherry imports into the USA increased from 6% in 1986 to 18% in 2004 (Thorsbury and Woods 2005). Competitors from Poland have developed superior packaging for products like cherry juice that is easy to use, adequately protects the product, and fulfills consumer needs. Some of the current cherry juice packages, including polyethylene jugs, and aluminum bottles, that Michigan manufacturers use do not adequately protect the product, enabling it to oxidize, resulting in the loss of health benefits and an off-flavor and odor (Paz-Gonzales 2006). It is clear that the package does not meet the needs of the product or of the consumer.

Preserving the nutraceutical benefits of tart cherry juice and communicating these benefits to potential consumers has become a primary goal of the Michigan-based growers of cherries. A nutraceutical is, "a comprehensive term which includes foods, dietary supplements, and medical foods that have a health-medical benefit including the prevention and/or treatment of disease,"

(DeFelice 2002). These foods include elements like antioxidants and oxygen radical absorption capacity units (ORACs), and are packed with nutrients. All of these substances may help prevent heart disease, cancer, arthritis, and help to promote a healthy life style. “Nutraceuticals compete in the vitamin and pharmaceutical market, and tend to be marketed as such through product and shelf positioning in stores,” (Hobbs 2002).

Tart cherries are a wealthy source of antioxidants (Wang et al. 1999). An antioxidant is a radical inhibitor found in foods (Bruice 2001) which can help protect against damaging oxidation of cell walls and structures in the body. Compounds that prevent oxidation have oxygen radical absorption capacity units (ORAC), units that exist to absorb free radical oxygen molecules that can cause damage to human tissues and organs. Tart cherries were found to have the 14th highest capacity of ORAC units of foods tested in one study (Halvorsen 2006).

Table 1: Antioxidant Content of Highest Containing Foods

Rank	Product	Antioxidant Content (mmol/serving)
1	Blackberries	4.746
2	Walnuts	3.721
3	Strawberries	3.584
4	Artichokes, prepared	3.559
5	Cranberries	3.125
6	Coffee	2.959
7	Raspberries	2.870
8	Pecans	2.741
9	Blueberries	2.680
10	Cloves, ground	2.637
11	Grape juice	2.557
12	Chocolate, baking, unsweetened	2.516
13	Cranberry Juice	2.474
14	Cherries, sour	2.205
15	Wine, red	2.199
16	Power Bar™, chocolate Flavored	1.875
17	Pineapple Juice	1.859

(Halvorsen 2006)

Tart cherry products also have scavengers of super oxide anions called superoxide dismutase (SODs). These are enzymes that act as extremely powerful antioxidants and are contained in very few natural foods (Cherry Advantage 2003). Antioxidant compounds provide the benefits of cancer protection, slow rates of portions of the aging process, prevent heart disease, and increase the health of the immune system. Antioxidants may also be beneficial during treatment for cancer patients. In a study performed with cancer patients undergoing radiation therapy, it was found that patients taking antioxidant supplements, "had a better quality of life without any adverse affects," after treatment (Prasad et. al 2002). It is suggested that the antioxidant compounds help protect normal cells while inhibiting cancer cells from growing.

Studies at both Michigan State University (MSU) and Oregon State University (OSU) have verified other health promoting compounds to be present in tart cherries. These other compounds include anthocyanins, and phenols. Anthocyanin is a flavanoid compound found in the skins of many fruits, flowers, and vegetables (Bruce 2001) and is responsible for cherries' red color. These compounds act as anti-inflammatory agents and were found to be more plentiful in Michigan tart cherries than that of commercial aspirin or ibuprofen (Wang et al. 1999). This may explain why arthritic pain and gout were reported to have been alleviated by the consumption of cherries (Blau 1950). Certain flavanoid compounds in tart cherries can break up monosodium urate, which causes some forms of arthritis (Cherry Marketing Institute 2006). Another potential explanation may be the abundance of other compounds that can inhibit the COX 1 and COX

2 enzymes, which are produced by the body as a response to pain. When these enzymes are inhibited, the body does not feel pain. These properties indicate tart cherry juice may be helpful in fighting against chronic pain.

Phenols or polyphenols are carbon based molecules that are found in many fruits and plants (Seeram and Heber 2003). Ellagic acid is among the many phenolic compounds found in tart cherries (Cherry Marketing Institute 2007) that may provide some healthful benefits to consumers. Ellagic acid is a powerful antioxidant that has been proven to be absorbed by humans from food sources (Seram and Heber 2004). Other phenolics found in tart cherries have shown to protect neuronal cells from oxidative stress (Kim et. al 2005). These compounds may offer added health benefits to consumers. These benefits will, undoubtedly become an important part of the packaging and labeling that is used to market the juice of tart cherries.

However, the US Food and Drug Administration (FDA) has only a few approved health claims about nutrients related to specific diseases, and these do not include anthocyanins or phenols found in cherries. If the FDA has not specifically approved the health claims, those benefits cannot be put on the labels. In October 2005, the FDA informed companies producing cherry products labeled with benefits suggesting the products fight cancer, arthritis, gout, heart disease, among others, that the products were considered drugs. Further, the FDA considered these products illegal drugs because they had not undergone the specific protocol for approval by the FDA, and threatened to seize them if they were not relabeled or taken off the shelf (Greensberg 2005). Therefore, because manufacturers cannot at present indicate health claims regarding the ability of

ingredients to fight or prevent disease, the packaging must convey that message in another way.

The need to earn consumer purchasing intentions made cherry juice an ideal candidate for this research project. The package must convey the nutraceutical benefits of the product in order to support the marketing strategy. To get tart cherry juice and tart cherry juice concentrate to market, utilization of the correct package is vital. The packaging must communicate to the consumer the healthful benefits of this product and be congruent with the consumer's image of juice packaging.

the first of these is the fact that the
the second is the fact that the
the third is the fact that the
the fourth is the fact that the
the fifth is the fact that the
the sixth is the fact that the
the seventh is the fact that the
the eighth is the fact that the
the ninth is the fact that the
the tenth is the fact that the
the eleventh is the fact that the
the twelfth is the fact that the
the thirteenth is the fact that the
the fourteenth is the fact that the
the fifteenth is the fact that the
the sixteenth is the fact that the
the seventeenth is the fact that the
the eighteenth is the fact that the
the nineteenth is the fact that the
the twentieth is the fact that the
the twenty-first is the fact that the
the twenty-second is the fact that the
the twenty-third is the fact that the
the twenty-fourth is the fact that the
the twenty-fifth is the fact that the
the twenty-sixth is the fact that the
the twenty-seventh is the fact that the
the twenty-eighth is the fact that the
the twenty-ninth is the fact that the
the thirtieth is the fact that the
the thirty-first is the fact that the
the thirty-second is the fact that the
the thirty-third is the fact that the
the thirty-fourth is the fact that the
the thirty-fifth is the fact that the
the thirty-sixth is the fact that the
the thirty-seventh is the fact that the
the thirty-eighth is the fact that the
the thirty-ninth is the fact that the
the fortieth is the fact that the
the forty-first is the fact that the
the forty-second is the fact that the
the forty-third is the fact that the
the forty-fourth is the fact that the
the forty-fifth is the fact that the
the forty-sixth is the fact that the
the forty-seventh is the fact that the
the forty-eighth is the fact that the
the forty-ninth is the fact that the
the fiftieth is the fact that the
the fifty-first is the fact that the
the fifty-second is the fact that the
the fifty-third is the fact that the
the fifty-fourth is the fact that the
the fifty-fifth is the fact that the
the fifty-sixth is the fact that the
the fifty-seventh is the fact that the
the fifty-eighth is the fact that the
the fifty-ninth is the fact that the
the sixtieth is the fact that the
the sixty-first is the fact that the
the sixty-second is the fact that the
the sixty-third is the fact that the
the sixty-fourth is the fact that the
the sixty-fifth is the fact that the
the sixty-sixth is the fact that the
the sixty-seventh is the fact that the
the sixty-eighth is the fact that the
the sixty-ninth is the fact that the
the seventieth is the fact that the
the seventy-first is the fact that the
the seventy-second is the fact that the
the seventy-third is the fact that the
the seventy-fourth is the fact that the
the seventy-fifth is the fact that the
the seventy-sixth is the fact that the
the seventy-seventh is the fact that the
the seventy-eighth is the fact that the
the seventy-ninth is the fact that the
the eightieth is the fact that the
the eighty-first is the fact that the
the eighty-second is the fact that the
the eighty-third is the fact that the
the eighty-fourth is the fact that the
the eighty-fifth is the fact that the
the eighty-sixth is the fact that the
the eighty-seventh is the fact that the
the eighty-eighth is the fact that the
the eighty-ninth is the fact that the
the ninetieth is the fact that the
the ninety-first is the fact that the
the ninety-second is the fact that the
the ninety-third is the fact that the
the ninety-fourth is the fact that the
the ninety-fifth is the fact that the
the ninety-sixth is the fact that the
the ninety-seventh is the fact that the
the ninety-eighth is the fact that the
the ninety-ninth is the fact that the
the hundredth is the fact that the

Chapter 2 - Literature Review

If the consumer does not foresee the product fulfilling needs, it will be discarded from consideration and will not be purchased. Additionally, the consumer must see the product as a solution to their problem for it to fulfill their needs. Unmet consumer needs can result in a negative perception and consumer desertion of a product (Beverland 2006). For example, specific attributes of wine can influence consumer perception (Beverland 2006). Consumers of wine look for authenticity composed of six attributes:

- **heritage and pedigree,**
- **stylistic consistency,**
- **quality commitments,**
- **relationship to place,**
- **method of production, and**
- **downplaying commercial motives.**

Wines that did not meet these criteria were less valued and less preferred; demonstrating unmet needs result in abandonment of the product.

A second example is devastating effect New Coke had on the Coca-Cola Company in the 1980s. In 1985, Chairman Roberto Goizueta announced the launch of “the most significant soft drink development in the company’s (Coca-Cola) history,” (Peter and Olson 2005). The company released a newly formulated soft drink, “New Coke,” which changed the 99 year old formula. The company changed the taste in order to regain market share from their competitor Pepsi. However, the change was not well

received by consumers. Not only did the company lose market share, but they lost the loyalty of millions of consumers who, eventually, organized a campaign to bring the old coke back (Oliver 1986). This further suggests that consumers who do not find their needs met will not purchase a product.

In addition to functional needs, a product must connect to the consumer on an emotional level. This can trigger past positive experiences that will inspire them to buy that product (Fleischman 1966). This has to do with the affect a consumer experiences when presented with a product (Figure 4). Connecting the affective response with cognition enables consumers to formulate thoughts about the product and decide whether or not to purchase. People who have expectations for a product are likely to form thoughts that are consistent with those expectations (Wyer and Srull 1989). The way a consumer thinks AND feels about a product, can ultimately influence their purchase intention. Intention to purchase depends on the degree to which consumers expect the product to satisfy them when they consume it (Kupiec and Revell 2001). If expectations of satisfaction are high, intentions to purchase are high, and consumption will likely occur.

I. Influence of Attributes

It is crucial that both the product and consumer be considered during package design; both the labeling and the package send messages regarding the product and its ability to fulfill a consumer's needs. Attempting to design a package with the consumer in mind decreases the likelihood that any features a consumer searches for will be overlooked (Pullman, Moore, and Wardell 2002). Therefore, manufacturers and designers must know

what the specific elements of a package suggest to consumers in order to send a clear message. They must know what attributes a consumer will look for in a product and design a package that will convey those attributes.

A survey of 380 University students in Poland investigated the kinds of packaging attributes that influence consumer choices of fruit juices (Cichon and Ucherek 1999). They found that functionality, capacity, ecological aspect, general look, and shape were among the top five attributes that determined consumer choice of packaging, with the first impression and first look at a package as the most important part of influencing purchasing behavior. Forty three percent respondents said package appearance could influence perception of product quality. Thus, the package can influence what a consumer thinks of a product. It can convey a positive image, suggesting benefits to the consumer, or a negative one, indicating the consumer probably will not benefit from purchasing it. Therefore, a package must indicate to consumers how the product and its attributes will benefit them. Cichon and Ucherek suggest what the consumer perceives at first look of a package and formulates as a first impression is the most important part of influencing purchasing behavior.

Consumer perception can be facilitated by what the package communicates about the product. Participants in a study investigating the process of selecting beverages were found to make a choice based on the freshness or quality suggested by the packages (Zeithaml 1988). Researchers of that beverage study were able to better understand what consumers perceive about products and what motivates them to buy.

Discovering and using these motives and the driving factors behind purchasing behavior is an extremely fertile ground for marketing experts (Peri 2006) which can later be translated into packaging designs.

Visual package elements play a major role, representing the product for many consumers. The size/shape and information of a package relate more to the affective side of consumer decision making (Silayoi and Speece 2004). These affective responses are the emotions or the feelings a consumer experiences upon decision making. For example, a consumer may feel a twinge of excitement when viewing a uniquely shaped bottle, possibly persuading them to consider it as a solution to their problem at hand. Other visual elements, like colors and graphics, were also discussed in this study's (Silayoi and Speece 2004) focus groups. Consumers agreed that these attributes had an influence on their purchase decisions. It appears, utilizing these features on a product to send a clear message to the consumer of how that product may benefit them, is a step toward earning purchasing behaviors.

The package also tends to aid in purchasing decisions when the consumer is uncertain of what choice to make. Consumers make decisions based on a problem they need to solve. In a situation where they are unsure about their choice, it becomes more difficult and the consumer must gather external information. When a package design can give a consumer information about a product, it adds a sense of quality to the product and can aid the consumer in his or her choice. In situations where the consumer is unsure of what decision to make, the package design has been used as a quality cue (Stokes 1984). This

means that packaging can help make a decision for a consumer when they are unsure of which brand/size/type of product they want to buy.

The choice of a product can also be heavily influenced by the package's material, (Van Dam and Van Trijp 1993) which is an example of a packaging attribute. Much like packaging is an attribute of a product, the packaging has its own attributes. These include the materials it is made from, color, size, shape and labeling. One example of how package material can affect product choices is the different perceptions of plastic and glass beer bottles. A 2006 survey revealed that most consumers (95%) prefer beer in glass bottles as compared to plastic (George 2006). Of the respondents that preferred glass, 37% perceive that beer stays colder longer in glass bottles. Ultimately, the belief that glass bottles maintain colder beer for longer periods of time, a functional attribute, leads to consumers choosing the glass bottle over the plastic because it enables them to fulfill their goal of drinking cold beer.

A package must also coincide with consumer's expectations of the product. The traditional wine bottle versus a bag in a box packaging system is one such example. For years, consumers thought only glass wine bottles with real cork closures were quality products. They expect that other packages do not provide as good of a product. However, the bag in box packaging system provides better protection from constantly changing temperatures, hard handling conditions, exposure to light, and oxidation (Tinney 2005).

A 2002 study supports that consumer expectations must agree with the packaging for a positive response. Consumers were presented with beer, juice, and hot chocolate in three different containers; an amber beer bottle, a cylindrical glass, and a ceramic coffee cup (Raudenbrush et al. 2002). Consumers rated the pleasantness and intensity on a 0-10 scale. The beverages that were congruent with container expectations received higher scores than those that were incongruent. This suggests that beverages inconsistent with their packages will be perceived less positively than ones matching expectancy.

Beverage packages are of particular interest, because beverages cannot be distributed without containers (Van Dam and Van Trip 1993). A consumer focused product/package is vital to earn the purchasing behavior of consumers. It must protect the product as well as communicate beneficial attributes to the consumer and convey the message manufacturers wish to suggest.

Marketers and package designers have tried various strategies in an effort to gain purchase intentions of consumers. Whether it is a label that expresses benefits of the product, eye catching colors, or a design that caters to the needs of consumers, companies have repositioned and reintroduced products in order to increase sales. In 2002, Sherwin Williams reintroduced its Dutch Boy ® brand of paint. The new "Twist and Pour" was the first and only package of its type in the market. The plastic, square-shaped package featured an easy twist off lid, a handle and a pour spout that came in the gallon size. The redesign of the container focused on females, who were found to be a large portion of those purchasing the product and making decorating decisions (DNS Retailing Today

2002). The company has seen “multiple quarters of increase market share” (Arnold 2003) and had an enormous amount of attention from the market.

Similar results came from the redesign of the “Milk Chug” produced by Deans Food Company. Like the Dutch Boy redesign, the Milk Chug centered on meeting unmet consumer needs. In 1997, the company launched their milk in resealable plastic bottles that were targeted at 13-24 year olds and families (Jensen 1997). The small, 8 oz. containers were single serve, re-closable, and fit easily in a car cup holder or lunch box. Deans Food Co. responded to consumers need for a drink on the go and the market reacted positively to the redesign with an increase in sales. In 1998 the company saw a 96% increase in sales of chocolate pints of milk and a 77% increase in sales of pints overall (Markgraf 1998). The change, in fact, had influence over the entire category, not just Deans. Markets without the new package stayed flat or declined, while those with the new chugs grew 1.3% (Thompson 1998).

Recently, the Michigan cherry industry has attempted to meet consumer needs and reposition their products by emphasizing the healthful benefits of tart cherries. Although a marketing scheme is in place, an analysis of what packaging best communicates healthful benefits to consumers has yet to be established. By testing different types of beverage packaging, this project aims to identify what packaging elements convey the nutraceutical benefits of tart cherry juice to consumers.

Chapter 3 - Research Methods

I. Objectives

The overall objective of this research is to identify which elements of a package communicate nutraceutical properties of tart cherry juice. This study investigates the functions of packaging as attributes of the product, as well as other characteristics to observe if they have an effect on consumer perception.

More specifically, this research intends to:

- ▲ Identify how different types of beverage packages may influence consumer's perception of a product
- ▲ Provide information and evidence to the cherry industry about the impact beverage packaging may have on consumer perception of their product; and
- ▲ Develop a Means End Chain for cherry juice

II. Methods

i. Focus Groups

A focus group is a group of eight to ten people together discussing a similar topic. The goal of a focus group is to listen and gather information from the participants. The people for these groups are selected because they have something in common. In this case, the participants all drank juice. Six consumer focus groups were conducted to examine consumer perceptions of juice packaging and package attributes that convey healthful benefits.

ii. Composition of Focus Groups

Due to the suggested beneficial effects of cherry juice consumption for diseases like arthritis, heart disease, and cancer, cherry juice has traditionally been marketed to those who are at higher risk for these diseases. (See appendix G) In all cases, the prevalence of these diseases increases with age. The aim of this study was to expand the focus of the cherry industry into other markets, suggesting cherry juice is not just for a specific population with diseases, but for everyone.

The groups were composed of three different types of consumers: mothers with children between the ages of four and twelve, adults aged 24-29, and adults aged 41-51. Two different group sessions were conducted with each of the three types of consumer groups (see Table 2 for information about the composition of the groups). Table 2 gives some information about the number of participants who drank cherry juice.

Table 2: Composition of Focus Groups

	Total	Males	Females	Average Age	Education
41-51 year olds	23	10	13	46.7	82.6% completed college or above
24-29 year olds	18	8	10	25.8	77.7% completed college or above
Mothers	18	0	18	38.4	72.2% completed college or above
Total	59	18	41		80.0% completed college or above

Table 3: Participants who had at least tried cherry juice

41-51 year olds	24-29 year olds	Mothers with children
9	5	7

Recruitment of participants began approximately two weeks before the focus groups were conducted using a variety of resources. Flyers were posted throughout the campus community, two campus list serves (one that was composed of breast feeding mothers and a second composed of those caring for an elderly family member) and word of mouth advertising were all used to recruit participants for the six focus groups. Potential focus group participants were instructed to contact a member of the research team who then performed a screening questionnaire (see appendix A). The questionnaire was used to eliminate those who were not within the target population of the study.

Exclusion criteria were as follows: people who indicated that they did not drink juice, and/or people who did not fall into the targeted age range. For participants that qualified, name, age, and contact information were recorded and they were informed of the specifics of the study. Further contact was made by a member of the research team, reminding qualified participants of the time and date of the focus group. Ten to twelve participants were recruited with the intention that at least 8-10 would attend each focus group session. As a result of the recruiting technique, participants were recruited from Michigan State University's campus and the surrounding Lansing area. The focus groups were held at Michigan State University in the Communication Arts and Sciences building in room 182, during weekday evenings. Two focus groups were conducted for each of the three demographic groups previously mentioned

III. Materials

Eight different package types were used in this study. The study aimed to include the most common packages presently used for juice in today's U.S.

marketplace. It also included some packages that are popular in other global markets.

Packaging types tested included:

- glass bottles,
- gable top cartons,
- Polyethylene terephthalate (PET) bottles,
- tetra packs® (brick packs),
- aluminum bottles,
- High Density Polyethylene (HDPE) bottles,
- flexible pouches,
- specially designed glass and plastic bottles for POM ® Wonderful Pomegranate Juice

i. Glass Bottles

According to the Global Marketing Information Database (GMID), glass bottles are expected to grow in the market as a package for high quality drinks (GMID 2006). The GMID reports a potential rise in the use of glass for functional drinks and ready-to-drink coffee suggesting that “natural products using high quality ingredients” would be a perfect fit for glass packaging (GMID 2006).

Glass bottles used in this project were donated by St. Gobain, (Scottsdale, AZ). (See Figure 5). The bottles have a capacity of 12.75 fluid ounces, a narrow neck, and are identified by mold number 4356012B. They are 7.719 inches in height, have a diameter of 2.492 inches, and a continuous thread finish (designation 38-400). The bottles were sealed with metal screw caps with plastisol liners (SG containers 2007). The glass bottles are clear with gold caps¹ and were filled with juice to a consistent level. A total of twelve bottles were used for this research project.

¹ For a more technical description please see Gonzales 2007

and were filled with juice to a consistent level. A total of twelve bottles were used for this research project.



Figure 5- Glass Bottle

ii. Gable Top Cartons

The gable top carton was introduced in 1915 when it was patented by J. Van Wormer. However it was not until the 1930s that Ex-Cell-O commercialized its use. This new alternative to glass was lighter weight and reduced the cost of filling (Twede and Selke 2005).

Today in the marketplace, gable top cartons are used for milk, juices, protein drinks, and many other beverages. "Gable-top liquid cartons remain an economical choice for 100% juice, nectars and some RTD (Ready-to-Drink) tea, offering good barrier protection for perishable products as well as easy stacking on refrigerated shelves,"(GMID 2006). The use of a continuous thread closure in gable tops make beverages easy to pour and ideal for repeat use. In 2005 GMID reported that there were 2.2 billion gable top cartons used for fruit and vegetable juices and 336 million used for functional drinks.

The gable top cartons for this study were donated by Elo-Pak, New Hudson, MI (see Figure 6). The cartons are made of plastic coated bleached kraft-paper and have a height of 7.512 inches with a width and depth of 2.9595 inches. They are equipped with a pour spout with a continuous thread closure and a polypropylene cap. The cartons were provided un-printed and filled to capacity with 25 fluid ounces of water. Only eight cartons were procured for testing, so participants had to share in instances when there were more than eight participants during a focus group session.



Figure 6- Gable Top Carton

iii. Polyethylene teraphthalate (PET) bottles

Since its introduction in the 1970s, PET has steadily gained a foothold in almost every type of beverage industry. "For manufacturers seeking portable, single-serve convenience, PET remains, by far the most popular material, being lightweight, clear and unbreakable" (GMID 2005). In 2005, approximately 68

billion units of PET bottles were used for beverages in the United States and that number is expected to continue growing by 87 billion in 2010 (GMID 2005).

For this study, PET bottles were purchased from Sam's Club™, (Lansing, MI) as beverage containers for Tropicana™ (see Figure 7). The bottles have a height of 6.692 inches with a maximum diameter of 2.2345 inches. The bottles are equipped with a 1.23 inch continuous thread closure and threaded polypropylene cap.

Labels were removed and the bottles were scrubbed with hot water and sponges to remove excess labels and adhesive. In addition, Goo-Gone™ was used to remove any excess adhesive on the bottles. The bottles were filled with juice to a consistent level. Twelve bottles were used for the focus groups.



Figure 7- Polyethylene Terephthalate Bottle

iv. Tetra brick (brick packs)

The tetra brick (Figure 8) also called the brick pack, was invented in Sweden in the 1950s by Akerlaund & Rausing. The package, made of plastic coated paperboard, was a formed and filled tetrahedron (Twede and Selke 2005).

sizes of brick packs are actually thought to have higher quality products by some consumers. But those packages and products are those that are often imported to the states from other countries (GMID 2006). Therefore, it is the consumer's perception that no quality products produced in the U.S. are packaged in tetra bricks.

The tetra brick was chosen for this study due to its popularity internationally. In 2005, 1.9 billion brick packs were used for fruit and vegetable juices in the United Kingdom alone (GMID 2006). During this same time period, the U. S. consumed 1.1 billion packs for fruit and vegetable juices. By contrast, in Japan, 786 million brick packs were used for fruit and vegetable juice, but over 5.6 billion were used for other beverages like specialty drinks, ready-to-drink teas, and concentrates. The success of the brick pack outside the U.S. market demonstrates potential for it to grow within the U. S.

Hershey's chocolate milk (8 fluid ounce) brick packs were purchased from a Meijer Retail and Grocery SuperCenter (Lansing, MI) (see Figure 8). The brick packs have dimensions of 4.1645 inches by 2.635 inches by 1.57 and held 8 fluid ounces of liquid. The packs were inconsistent the other treatments because they were printed. As such, spray paint was applied to cover the labeling. A coat of flat white Rust-Oleum® High performance enamel was used to paint the packs, leaving a blank white surface. Several coats were applied to ensure that no information from the label was visible. Finally, three coats of glossy white Rust-Oleum® high performance enamel was used to paint the tetra bricks, so they had a shiny finish. The brick packs were purchased containing 8 fluid oz of liquid and

information from the label was visible. Finally, three coats of glossy white Rust-Oleum® high performance enamel was used to paint the tetra bricks, so they had a shiny finish. The brick packs were purchased containing 8 fluid oz of liquid and that amount was used for the focus groups. Twelve brick packs were used for the focus groups.

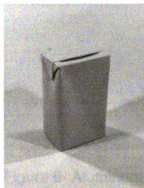


Figure 8-Tetra Brick (brick pack)

v. Aluminum bottles

The aluminum bottle is a newcomer to the world of beverage packaging. It was first introduced in Japan and has been used all over the world for alcoholic beverages, energy drinks, and most recently, for beer in the U.S. (Lukas 2005). The aluminum bottle is lightweight and recyclable, making it a good option for juice containers.

The aluminum bottles used for this study were donated by CCL containers (Hermitage, PA) (see Figure 9). The bottles have a capacity of 18 fluid ounces and a height of 7.953 inches with a maximum diameter of 2.5850 inches. The closure system is an aluminum cap with a size 38 snap slug that matches a polyethylene lug coating on the finish of the bottle. The bottles were filled with

water to a consistent fill level of 18 fluid ounces and 12 bottles were used for the focus groups.



Figure 9- Aluminum Bottle

vi. High Density Polyethylene (HDPE) Bottles

Another newcomer to the world of packaging is the High Density Polyethylene (HDPE) "Chug™". Although HDPE bottles have been used in the packaging industry previously, this particular design and shape was introduced in 1997 by the Deans Food Company. The HDPE bottle was chosen for this project because of its positive impact on the dairy market.

The High Density Polyethylene bottles were purchased from Sam's Club™, (Lansing, MI) in the form of beverage containers for Dean's™ chocolate milk (see Figure 10). The containers have a capacity of 16 fluid ounces and a height of 6.890 inches with a maximum diameter of 2.624 inches. The closure system is a (36 mm) continuous thread closure. The shrink sleeve labels and milk were removed, and any excess milk was rinsed from the package with warm water.

Twelve packages were used for this study and filled with water in order to simulate juice filled bottles.



Figure 10- High Density Polyethylene Bottle

vii. Flexible Stand Up pouches

The flexible stand up pouch has commonly been used in the industry for fruit drinks. In 2005 GMID indicates the lead maker of pouches expanded use of the packages into 100% fruit juices and some functional drinks in the U.S (GMID 2006). During that same year, over 4.2 billion flexible pouches were used for fruit and vegetable juice drinks, with another 768 million used for functional drinks. The Euromonitor reports, "pouches are a popular choice for single-serve juice among both parents and children," (GMID 2006) making them an ideal candidate for packaging cherry juice in a single serve, on-the-go manner. The flexible pouch is also light weight and, in this case, reclosable.

The flexible stand up pouches were donated to this project by Performance Packaging (Las Vegas, NV) (see Figure 11). The packages tested were a multi layered laminate of polypropylene (PP) / aluminum / high density polyethylene (HDPE). Finished containers held 7 fluid ounces. The overall

thickness of the pouch material is approximately 5 mils and the threaded closure-caps system is made of polypropylene. They have a height of 6.890 inches and a width of 3.079 inches.

Donated pouches were printed, so, as with the brick packs, pouches were painted to create a neutral treatment. A coat of chrome Rust-Oleum® was applied using several thin coats until the information on the label did not show through. As with the HDPE bottles pouches were also filled with water (6.5-7 oz.) to simulate a juice product inside. Only eight pouches were procured for testing, so participants had to share in instances when there were more than eight participants per focus group.



Figure 11- Flexible Stand Up Pouch

viii. POM Wonderful® packages

Three POM® packages were presented to focus group participants (see Figure 12) *after* they had finished discussions of the seven different types of packages for juice products and nutraceuticals. Two of the POM® packages were made of glass and the third was made of Polyethylene Terephthalate (PET). The packages measures 6.811 inches tall and the glass package had a maximum

diameter of 3.2160 inches while the plastic had a maximum diameter of 2.3150 inches. The proprietary shape resembles two spheres, one on top the other. The POM® bottle was introduced in late 2002 as a package for pomegranate juice and were purchased for this project from Goodrich's Grocery Store (East Lansing, MI).



Figure 12-POM® Wonderful Package

Like cherry juice, pomegranate juice makes claims of healthful properties that are beneficial to those that drink it (Fuhrman et. al 2005; Pantuck et. al 2006; Lansky and Newman 2007). The intention was that this package would serve to catalyze comparisons for today's marketplace regarding juice packaging and healthful attributes.

IV. Procedures

The focus groups lasted no more than an hour and a half and the participants were asked a series of questions from an IRB approved moderator guide (see appendix B- IRB-06-844) about the first seven packages. Participants were seated at a rectangular table. Each focus group was video recorded and researchers took notes while the sessions occurred.

Before the beginning of each focus group, consent forms, approved under IRB 06-844 / APP# i025745, were signed and collected (see Appendix C), as well as demographic information (see Appendix D). After introductions were made, the discussion began with a warm up question and general comments about packaging, asking participants whether or not packaging was something they noticed when shopping (see Figure 13 for a visual representation of procedure). Afterward, the different package types discussed in the materials section, with the exception of the POM[®] package, were presented to the participants, and where possible, each consumer received one of each type of package. The exceptions were the flexible pouch and the gable top carton, limited supplies forced participants to share these containers. The participants were asked to rank, on a scale of 1 to 7, which package they liked best and which package they liked least (1=Best; 7=Least). Following the individual rankings, the moderator asked the participants to publicly identify which package they liked best and give a brief description of the reasons for their choice. General discussion was held about the characteristics of the package that made the participants choose it as their favorite. The moderator then asked the participants to identify which package they liked the least and a brief discussion was held on the reasons for their choices. Next, the moderator asked the participants to identify, if any, beverage packages they did not see amongst the seven in front of them. Packages mentioned were discussed further, to identify the characteristics the participants liked and did not like about those specific packages.

At this point, discussion was directed to juice and types of juice packaging the participants commonly purchased. The characteristics of the products and

juice packages mentioned were discussed to get a feel for what the consumers typically looked for when shopping. Next, a question was raised about the package's ability to send a message about the product and it was discussed on how a package could convey healthful benefits to consumers. The participants were then asked about nutraceuticals and the healthy properties of cherry juice. Participants were encouraged to volunteer what, if any, information they knew about cherry juice. Then the participants were asked if there was any way that a package could communicate to consumers the nutraceutical properties of cherry juice. The discussion focused on package type as well as some characteristics of the label that could be utilized to communicate with consumers. Finally the participants were asked to imagine there was cherry juice inside the packages in front of them. They were asked to consider a package that would best communicate the nutraceutical properties of the juice to consumers and display a healthy image. Once again, the consumers were asked to rank scale of 1 to 7, which they liked best to which they liked least. (1=Best; 7=Least). The moderator asked the participants to hold up the package they liked the best for cherry juice and discussion followed about why consumers made their selections.

As a last measure, the moderator presented the participants with the POM® juice package; both in glass and in plastic. The discussion was open to participants to suggest what they liked and did not like about the packages. They were asked what about the package might indicate healthy benefits. The moderator then asked for any final thoughts or comments about topics that were discussed. Finally, incentives were distributed to the participants.

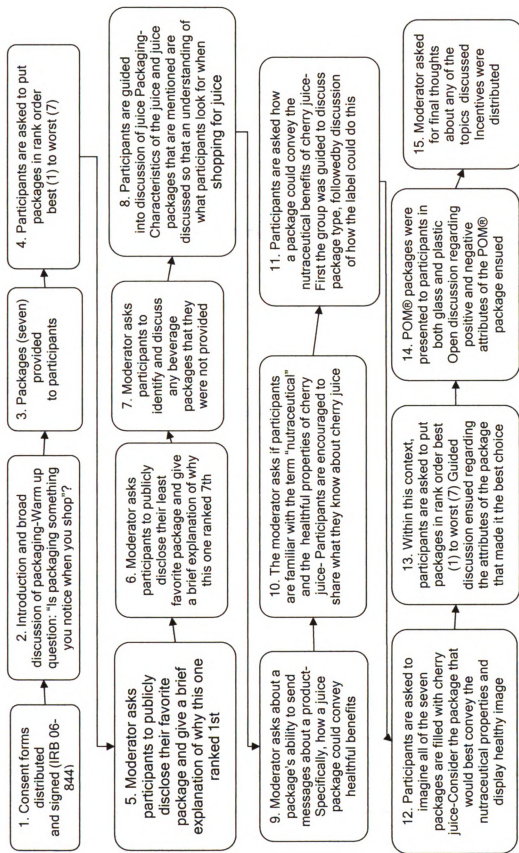


Figure 13: General flow of discussion for focus groups

Chapter 4 - Methods for Analysis

The data for this study were analyzed in several different ways:

- I. The rank order was used to analyze data for shifts using SPSS.**
- II. Abridge transcripts were created and broken into thought units, coded, and inputted into SPSS for analysis**
- III. The discussion and comments from the focus groups were analyzed using abridged transcript, notes and review of the video recordings. Using the long table approach, themes were identified and a Means End Chain for Cherry juice was created.**

I. Analysis of Package Rankings

Rankings that were collected during steps 4 and 13 of the focus group (see Figure 13) were keyed into SPSS and analyzed using cross-tabs, chi-squared analysis to test if there were significant differences between rank ordering before and after the discussion of cherry juice. In addition, cross-tabs, chi-squared analysis was used to test if there were significant differences between demographic groups in the participants' selection of their favorite package

II. Thought Unit Analysis

During the sessions, researchers took notes and tried to highlight the common themes of the focus group. In addition, the sessions were video recorded and after all sessions were completed, a researcher reviewed the tapes and created an abridged transcript. An abridged transcript is a method for creating material to analyze focus groups (Krueger and Casey 2000). This

method includes a researcher viewing and listening to a video recording tape of each respective session and transcribing only the pertinent information to the study. An abridge transcript is, “a condensed version of the focus group with irrelevant conversation removed,” (Krueger and Casey 2000). To ensure the researcher did not focus on particular themes heard in previous focus groups, no tapes were transcribed until after all focus groups were completed.

Although focus groups are typically the source of qualitative data, it is possible to create a quantitative analysis from the information gathered through a technique referred to as “content analysis.” This technique includes the rigorous analysis of the content using, “approaches that emphasize the reliability and replicability of the observations and subsequent interpretations,” (Stewart and Shamdasani 1990). In this case, a system was created that broke the focus group transcripts into thought units. Each unit was then coded with a scheme that was created based on the major functions of packaging (containment, communication, protection, and utility) and further broken down with the constructs of the means-end chain theory. An “other” category resulted for statements that did not fit logically the functions of packaging, but it was used sparingly. A total of 24 sub categories resulted.

Due to the large amount of data and multiple categories, decision rules were created in order to aid researchers to qualify statements into the most appropriate categories. A unit was first categorized in the functions of packaging, and then further qualified as a functional consequence, psychosocial consequence, or a value. These rules enabled the data to be broken up for a more indepth analysis.

Two coders were used in this study to establish reliability. Coders for this study both had previously taken courses in understanding and applying the main functions of packaging, as well as the means-end chain theory. The coders spent approximately 15 hours reviewing the data, revising the codebook and decision rules. Units were coded separately by the two coders, using 5% of the overall data using the coding sheet and decision rules. The initial intercoder reliability was satisfactory (Cohen's Kappa = 0.73; see end off appendix E: Steps 1-8 for calculation). Discrepancies were discussed and resolved over another time period of approximately 3 hours to improve understanding of the decision rules.

i. Containment

As mentioned, containment is the function of the package that enables the product to be moved. It is defined as the package's ability to allow the product to be handled, used, and transported. Statements in this category pertained to the package's enclosure of the product and use it incurred from that enclosure (e.g. "its contained in one unit" or "I'd rather have the glass, it feels different than this plastic").

ii. Protection

Protection was defined as guarding or preserving the product for use, or against any outside environmental factors. Statements regarding protection of the product attributes for its required shelf life or from external hazards were coded in this category. In addition statements that indicated the product's interaction with the package fell into this category (e.g. "It tastes better in aluminum").

iii. Communication

Communication was defined as statements suggesting what the package indicated to the consumer about the product. Communication was further coded into “labeling” and “communication” categories. Statements that had to do with the package labeling or any sort of contents that might appear on the label or on the package itself were defined as labeling. According to the USFDA, under the Federal Food, Drug, and Cosmetic act, a food product’s label must include nutritional information, ingredients, manufacturer information, identity, nutrient content claims, and serving size (CFR 2004). Statements from the focus groups pertaining to these items, graphics, or the like fell into the “labeling” category, (e.g. “And have a cherry, and a heart next to it.”). Statements pertaining to the size, shape, type of packaging or transparency fell into the “communication” category (e.g. I would want it to be clear, to see the color of the juice”).

iv. Utility

Utility broadly encompassed the use of a package. This was broken down further into use of the package, storage, and end use. “Use of the package” included statements that had to do with features aiding pouring, opening or closing (e.g. for the plastic bottle this category would include the statement “you can reclose them”). Statements pertaining to the later use of the product were included in the storage category (“I think it [carton] goes easily in an out, goes into grocery bags well plastic or paper”). And finally, the subcategory, end use, dealt with the package after consumption of the product. Statements indicating advantages or disadvantages with regard to disposal, recycling, or reuse fell into

this category ("I don't think this is cardboard I think this is paperboard- it's not recycleable").

v. Other

"Other" was a collection of statements that could not be sorted into any of the previous categories. Typically these statements included thoughts unrelated to packaging. Coders were instructed to use this category sparingly.

Coders used tables to organize the thought units into a form that could be effectively quantified. A separate table was done for each of the three groups of interest (mothers with children, adults 24-29 and adults 41-51). (Please see Table 1, which includes statements from all three groups to illustrate the different types of thought units).

Table 4: Coding sheet
Overall category

Secondary category Code Exemplary Statement

Containment (for handling, transportation and use) (Abbott 1989)	Functional consequences	Cont-Func 1	"bigger quantities, unless we have to buy something little for the kids"
	Psychosocial consequences	Cont-Psy-2	"A small child less likely to drop it"
	Values	Cont-Val-3	"Glass is more special, something different"
Protection (and or preservation of the contents for required shelf life use life and sometimes protection of external environment from any hazard or contact with the contents) (Abbott 1989)	Functional consequences	Pro-Func-4	"Solid, resistant to puncturing"
	Psychosocial consequences	Pro-Psy-5	"Glass has a cool appearance"
	Values	Pro-Val-6	
Communication (or identification of content, quality quantity, and manufacturing, usually by means of printing, decoration, labeling, package shape or transparency) (Abbott 1989)	Labeling	Lab-Func-7A	"But I go for the lower acid content"
		Lab-Psy-8B	"If it boasted it didn't have corn syrup in it"
		Lab-Val-9C	"I like the word organic,"
	Size/shape/pkg type, etc	Comm-Func-10A	"It's a good quantity"
		Comm-Psy-11B	"Glass- I can see what I'm getting"
		Comm-Val-12C	"I like the shape of it- reminds me of how the moms go and change the milk bottles"

Table 4 Continued

Utility (or performance which would facilitate dispensing and use of products, including ease of opening, reclosure, portioning,, application, unit of use, multipacks, safety, second use or reuse and working features such as are found in sprays, and especially provision for instructions) (Abbott 1989)	Use of product	Functional consequences	Use-Func-13A	"I guess a handle makes sense if it is heavy initially"
		Psychosocial consequences Values	Use-Psy-14B Use-Val-15C	"trendy, stylish in front of my student's" "I like that because I like the container"
		Functional consequences Psychosocial consequences Values	Stor-Func-16A Stor-Psy-17B Stor-Val-18C End-Func-19A	"Its something Id thrown in my car" "Resealable are important" "You can't drink it all at once" " Its recyclable"
	End use	Functional consequences Psychosocial consequences Values	End-Psy-20B End-Val-21C	
		Functional consequences	Other-Func-22	"In fact the next time I go to the store I will look for that /and I will want to taste it"
		Psychosocial consequences Values	Other-Psy-23 Other-Val-24	I do try-but I love Hawaiian punch" "If I am worried about health- I will send water"
	Other (comments that did not fit into the categories provided)			

vi. Means End Chain

Each of the five categories were further broken down by the constructs of the means-end chain. Again, the means end chain suggests that attributes suggest functional and psychosocial consequences to consumers, which ultimately lead them to values or end goals of being. Therefore, each category was further coded into functional consequences, psychosocial consequences and values. Statements pertaining to the function of the package like "it's convenient," or "it's easy to use" demonstrate functional consequences, while statements pertaining to the image, or how a person would feel about a package while using it are psychosocial consequences. The statements: "The aluminum bottle is trendy; I'd look stylish in front of my student's," is an example of psychosocial consequences. Finally, the values category included statements that indicated the participants would reach their personal values or could not further explain a reason for their reaction (e.g. "I don't know, I just like it").

III. Long table approach

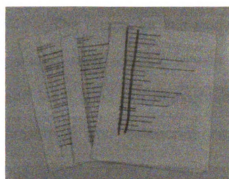
Using the abridged transcripts for each focus group session, analysis was performed by the long table approach. The long table approach is a method of cutting the transcripts and grouping the quotes into categories under each research question. "It is a time-tested method," (Krueger and Casey 2000) and enables the data to be grouped by categories and themes.

First, two copies of each transcript were printed. One copy was used as a reference and the other was used for analysis. Each transcript was color coded with markers by running a solid colored line down the left hand margin of each page. One line was used for the first focus group of each respective demographic, and two lines were used for the second. The mothers with children were coded in yellow, the 41-51 year olds were coded in green, and the 24-29 year olds were coded in pink. Each research question asked during the focus groups was written on the top of individual pieces of newsprint. Beginning with the warm up question, which was about packaging in general, a researcher reviewed each abridged transcript and cut apart the quotes that answered the question and grouped them on the respective newsprint paper. For example, a question asked participants, "Do you notice packaging when you are shopping? Do you ever think about packaging when you are buying something? Do you ever buy anything just because of the package?" If answers to these questions were provided they were placed under the question. If the answers provided did not answer the question or were off topic, they were set aside for later analysis.

The researcher continued through all of the research questions asked and all of the transcripts, grouping similar ideas together. For example, if several

people mentioned they bought uniquely shaped glass bottles when they went shopping, those ideas would be grouped together. After all quotes from the transcripts were properly categorized, the researcher created a descriptive summary for each question. Themes that were consistent within a group were noted as well as themes that were consistent across each group. Ideas that were different between each group or that only one group mentioned were also noted. Based on the results of the discussion, a Means End Chain was created for cherry juice.

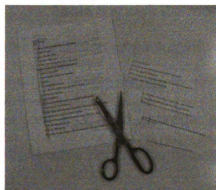
Figure 14: Procedure for the Long Table Approach



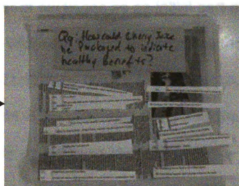
Step 1: Transcripts are color coded by focus group



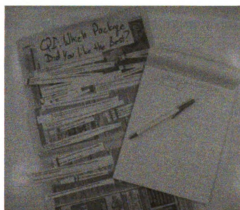
Step 2: Research questions laid out



Step 3: Transcripts cut apart



Step 4: Similar quotes grouped under appropriate research question



Step 5: Descriptive summaries created

Chapter 5 - Results

The results for this study are presented in three different ways. First, the package rank ordering results are presented and packages that were the best and least liked are highlighted. Second, the thought unit analysis results are presented and categories receiving the largest number of comments are highlighted. Finally, the themes and common ideas from the focus group discussion are mentioned.

I. Package rank order

Table 5 shows the mode of the rank order of packages as an initial part of the discussion of packaging. The glass bottle was selected most commonly as the best liked package in the first round of rank ordering. The PET bottle ranked second best liked package, earning a ranking of 2.00. Amongst the packages, the flexible pouch was selected most commonly as the least liked package and had a ranking most often of 7.00. Table 6 shows the mode for the rank order of packages after discussion of cherry juice. Again, the glass earned the best liked ranking (1.00) for cherry juice and the PET bottle was most commonly ranked second. The flexible pouch was ranked most commonly as the least liked package for cherry juice.

Table 5: Rank order of packages as an initial part of discussion

	Glass Bottle	Flexible Pouch	Gable Top Carton	Brick Pack	HDPE Bottle	Aluminum Bottle	PET Bottle
N Valid	55	55	55	55	55	55	55
Missing	2	2	2	2	2	2	2
Median	2.00	6.00	4.00	5.00	4.00	4.00	3.00
Mode	1.00	7.00	5.00	6.00	3.00	4.00	2.00

Table 6: Rank order of packages as a discussion of cherry juice packaging

	Glass Bottle	Flexible Pouch	Gable Top Carton	Brick Pack	HDPE Bottle	Aluminum Bottle	PET bottle
N Valid	53	53	53	53	53	53	53
Missing	4	4	4	4	4	4	4
Median	1.00	6.00	4.00	6.00	4.00	4.00	2.00
Mode	1.00	7.00	4.00	6.00	3.00	5.00	2.00

Table 7: Frequency of rank order by package as part of the initial discussion- Figure 8 step 4 (total possible responses- 57²)

	Glass	Flexible Pouch	Gable Carton	Top	Brick Pack	HDPE Bottle	Aluminum Bottle	PET Bottle
Best Liked	16	3	5		4	6	9	12
2.00	14	4	5		4	8	8	14
3.00	2	4	12		5	12	8	12
4.00	5	7	10		4	11	12	5
5.00	6	3	14		11	10	5	6
6.00	5	14	6		14	4	6	5
Least Liked	7	20	3		13	4	7	1
Missing	2	2	2		2	2	2	2
Total	57	57	57		57	57	57	57

Table 8: Frequency of rank order by package after the discussion of cherry juice packaging- Figure 8 step 13 (total possible responses- 57²)

	Glass	Flexible Pouch	Gable Carton	Top	Brick Pack	HDPE Bottle	Aluminum Bottle	PET Bottle
Best Liked	30	1	7		0	1	2	12
2.00	15	1	6		1	3	8	20
3.00	3	0	5		9	17	8	11
4.00	4	1	17		4	13	9	5
5.00	1	10	9		9	11	11	2
6.00	0	15	4		17	6	9	1
Least Liked	0	25	5		13	2	6	2
Missing	4	4	4		4	4	4	4
Total	57	57	57		57	57	57	57

² Two participants did not return their package rank order sheets

Tables 7 and 8 give the number of participants who ranked each package at each point on the rank order scale. Glass was ranked the highest by most participants both at the beginning and the end of the focus groups. Sixteen participants liked glass the best during initial discussions and 30 participants liked it best after cherry juice was indicated as the product inside. That was almost a doubling of the participants who ranked they liked it the best.

The flexible pouch and the brick pack both fell in rank order when the initial results and final results are compared. During the initial discussions, 20 participants ranked the pouch as the package that they liked the least, while 13 participants ranked the brick pack last. At the conclusion of the focus groups, the flexible pouch number increased to 25 as the package least liked, while the brick pack stayed consistent at 13.

Using SPSS tabulated data, a crosstab function was performed of the rank ordering of the packages at initial discussion and after the discussion of cherry juice. Several shifts in consumer ranking were indicated when comparing the results of the packages before and after they were indicated to have cherry juice in them. These shifts give some important insight into consumer perception of a package when a product context. They suggest that when the product is specified, consumer thoughts and feelings regarding the package change. This was noticed with the shifts in rank order of the packaging that occurred. The participants had opinions about the packages in general, but when the scope was narrowed to those packages containing cherry juice, their perceptions changed. This is consistent with the concepts of congruence noted by Raudenbush (et al.

2002) mentioned previously. Thus, it can be said that different package types do have an effect on consumer's perceptions of juice and cherry juice.

Table 9- Significant Shifts in Rankings as indicated by Cross-tabs, chi-squared analysis using SPSS

Package	χ^2	Sigma	Significant Shift?	Direction of Shift
Glass	35.816	0.057	marginal	Up
Flexible Pouch	70.095	0.000	Highly significant	Down
Gable-Topped Carton	33.841	0.527	No	
Brick Pack	25.762	0.687	No	
HDPE bottle	52.960	0.034	Yes	Down
Aluminum Bottle	58.365	0.011	Highly Significant	Down
PET Bottle	20.7846	0.979	No	

Significant shifts (≤ 0.05) are indicated in bold

i. Glass

Although the chi -square indicates a mildly significant change ($\chi^2= 35.816$, sigma= 0.57). The crosstab data indicated that 15 consumers ranked the package the best liked (1.00) before product indication and 30 consumer ranked the packaged best liked (1.00) after product indication. An upward shift was observed along the ranking scale as 13 participants ranked glass a 2.00 on the scale before product indication, and 15 after product indication. In addition, before product indication, five participants ranked glass a 6.00 and seven ranked it a 7.00 or liked it the least. After product indication, zero participants ranked the glass bottle in either of these categories.

ii. Flexible pouch

The findings of the crosstabs for the flexible pouch were significant ($\chi^2= 70.095$, sigma= 0.00). A downward shift was observed. Two participants ranked the pouch best liked (1.00) before product indication, but ranked it least liked

(7.00) after indication. A total of 18 participants ranked the flexible pouch least liked (7.00) before product indication which increased to a total of 25 participants after product indication. This increase in the flexible pouch as the least liked package (7.00) was observed from participant's rankings across the board.

iii. Gable top carton

Cross tabs for the gable top carton did not indicate a significant shift ($\chi^2=33.841$, $\sigma= 0.527$) in package rankings, however some observations were made. Throughout the scale, the gable top carton shifted upward. Before product indication, 12 participants ranked the package a 4.00 and after product indication, five ranked it a 3.00 or higher, with three participants staying consistent at a 4.00. Before product indication, 9 participants ranked the flexible pouch a 5.00 and after product indication, 7 participants ranked the package a 4.00 or higher. In addition, the best liked category increase from 5 participants to 7, after product indication.

iv. Brick Pack

The crosstabulation of the data for the brick pack before and after showed no significant difference ($\chi^2= 25.762$, $\sigma= 0.687$). However, some observations were made from the data. Before product indication, four participants indicated they liked the brick pack the best, and after product indication, zero participants indicated they liked it the best. Twelve participants ranked the package a 6.00 on the scale before product indication, which increased to 17 after product indication. Because the number of participants was consistent for ranking the brick pack the least liked package ($n=13$, $n=13$), it can

be assumed the increase in rankings of 6.00 were from participants who had previously ranked it more positively on the scale.

v. High Density Polyethylene Bottle

The crosstabs for the HDPE jug indicate a significant downward shift ($\chi^2=52.960$, $\text{sigma}=0.034$) in the participants rankings from before product indication to after product indication. Six participants liked the HDPE jug best before product indication, and one liked it best after indication. The other five participants shifted to rank the package as 2.00 (1 person), 5.00 (2 people), and 6.00 (3 people). Five people shifted from ranking the package a 2.00 to a 3.00 after product indication. Three people all ranked the HDPE jug a 6.00 after product indication, when before they ranked it at 3.00 (1 person), 4.00 (1 person), and 5.00 (1 person). The rest of the data stayed fairly consistent.

vi. Aluminum Bottle

The cross tabs for the aluminum bottle indicate a significant downward shift ($\chi^2=58.365$, $\text{sigma}=0.011$) in the participants rankings before product indication to after product indication. Nine participants indicate they liked the aluminum bottle the best before product indication and 2 indicated they liked it the best after product indication. Comparing before and after discussion of cherry juice, five people shifted their rank of the package to 4.00 or lower. Before product indication, five people ranked the aluminum bottle a 5.00 and after indication, the number of participants increased to 11. This increase was observed from at least five participants ranking the package lower. Six participants ranked the aluminum bottle a 6.00 before product indication, and 9 ranked it a 6.00 after indication. At least seven people shifted their rank of the

aluminum bottle after it was indicated to have cherry juice in it from a higher rank to a 6.00.

vii. Polyethylene Terephthalate Bottle

The cross tabs do not indicate a significant shift of the consumer rankings before product indication to after product indication ($\chi^2 = 20.7846$, $\sigma = 0.979$). However, some observations were made. Before product indication, 13 participants ranked the PET bottle a 2.00 and after product indication, 20 ranked the package a 2.00. In addition, 12 participants ranked the PET as the one they liked best after product indication as compared to 11 before product indication. Participants who ranked the bottle a 4.00 before product indication (4 people), shifted their ranking to 2.00 and 3.00 after product indication. Six people who ranked the package a 5.00 shifted their rankings to best liked (1.00), 2.00, and 3.00 after product indication, and one person who ranked the packaged least liked before product indication, ranked it a 2.00, after indication.

II. Packaging Rank Order by Demographic Group

Additionally, the rankings were broken down by demographic group. Table 7 and 8 give the findings of the preferred package before and after the facilitator initiated discussion of cherry juice.

Table 10: Frequency of best liked package as part of initial discussion by demographic group -Figure 8 step 13 (total possible responses- 57³)

	Glass	Flexible Pouch	Gable Top Carton	Brick Pack	HDPE Bottle	Aluminum Bottle	PET Bottle
Before							
41-51	7	1	2	0	3	4	3
24-29	7	1	2	0	1	2	3
Moms	2	1	1	4	2	3	6

Package with the greatest frequency of respondents are presented in bold

Table 8: Frequency of best liked package after the discussion of juice packaging, with a final emphasis on cherry juice- Figure 8 step 13 (total possible responses- 55⁴)

	Glass	Flexible Pouch	Gable Top Carton	Brick Pack	HDPE Bottle	Aluminum Bottle	PET Bottle
After							
41-51	15	0	1	0	0	1	1
24-29	7	0	5	0	1	0	3
Moms	8	1	1	0	0	1	8

Package with the greatest frequency of respondents are presented in bold

Table 7 shows both 41-51 year olds and 24-29 year olds preferred glass bottles during the initial discussion which was based on packaging in general. During this same point in the discussion, the focus groups consisting of mothers liked the PET bottle the best, with six participants ranking it the best liked (see Table 7).

After discussion focused on cherry juice (see Table 8), glass remained as the preferred package for the 41-51 year olds, with 15 participants ranking it best (1.00). The 24-29 year olds stayed consistent with 7 participants giving it a 1.00, again making it the package they liked the best. Six more participants within the

³ Two participants did not return their rank order sheets

⁴ Two participants did not return their rank order sheets and two sets of responses were thrown out because the participants did not respond according to the correct procedure.

mothers with children demographic group selected the glass bottle as the package they liked the best, increasing their number to 8.

However, eight participants from the mothers with children also selected the PET bottle as the package they liked the best. As such, the glass bottle and PET bottle both ranked favorably when rated by mothers, while the glass bottle was the best liked by the 41-51 year olds and the 24-29 year olds. Significant difference existed between demographic groups at the initial discussion of packaging for the brick pack ($\chi^2=7.958$, $\text{sigma}=.019$) for which package the participants liked the best. Significant differences existed between demographic groups for the glass bottle ($\chi^2=7.938$, $\text{sigma}=.019$), the gable top carton ($\chi^2=6.509$, $\text{sigma}=.039$), and the PET bottle ($\chi^2=7.248$, $\text{sigma} = .027$) after discussion of cherry juice.

III. Results of Coding

The following table summarizes results of the coding of thought units. Table 9 represents all comments and their respective categories. One thousand eight-hundred and ninety nine thought units were coded into twenty four different categories. The four package functions were the major categories, which were broken down into sub categories using attributes of those functions and the constructs of the Means End Chain. Labeling within the communication category obtained the most thought units, and the communication category obtained the most thought units overall.

Table 11: Thought unit Results

		41-51 year olds	24-29 year olds	Mothers with Children	Total by sub- category	Total by Major category	n(%)
Packaging Functions Containment							
	Functional	30 41.7	31 43.1	11 15.3	72 3.79	126 6.64	
	Psychosocial	4 11.4	19 54.3	12 34.3	35 1.84		
	Values	0 0.0	14 73.7	5 26.3	19 1		
Protection							
	Functional	20 60.6	8 24.2	5 15.2	33 1.74	86 4.53	
	Psychosocial	3 18.8	9 56.3	4 25.0	16 0.84		
	Values	17 45.9	17 45.9	3 8.1	37 1.95		
Communication Transparency, Size, Etc.							
	Functional	32 29.9	37 34.6	38 35.5	107 5.63	376 19.80	
	Psychosocial	41 22.8	72 40.0	67 37.2	180 9.48		
	Values	38 42.7	31 34.8	20 22.5	89 4.69		
Labeling							
	Functional	38 40.0	33 34.7	24 25.3	95 5	635 33.44	
	Psychosocial	81 28.6	118 41.7	84 29.7	283 14.9		
	Values	119 46.3	61 23.7	77 30.0	257 13.5		
Utility Use							
	Functional	64 25.4	89 35.3	99 39.3	252 13.3	401 21.12	
	Psychosocial	14 12.8	29 26.6	66 60.6	109 5.74		

Table 11: Continued

	Values	14	35.0	14	35.0	12	30.0	40	2.11		
Storage	Functional	7	24.1	16	55.2	6	20.7	29	1.53	45	2.37
	Psychosocial	2	18.2	8	72.7	1	9.1	11	0.58		
	Values	2	40.0	3	60.0	0	0.0	5	0.26		
End Use	Functional	24	57.1	12	28.6	6	14.3	42	2.21	81	4.27
	Psychosocial	12	50.0	0	0.0	12	50.0	24	1.26		
	Values	8	53.3	5	33.3	2	13.3	15	0.79		
Other	Functional	14	29.2	19	39.6	15	31.3	48	2.53	149	7.85
	Psychosocial	17	29.8	25	43.9	15	26.3	57	3		
	Values	12	27.3	26	59.1	6	13.6	44	2.32		
Total thought Units		613	32.3	696	36.7	590	31.1	1899	100		

The distribution of thought units across all the focus groups was fairly even. Across all the focus groups, the participants made the most comments in the category of communication, with an emphasis on labeling. Thought units in regard to communication accounted for over half of the units recorded (see Table10). The psychosocial consequences and values for labeling were the categories that received the largest number of thought units at 283 and 257 respectively.

Table 12- Significant differences between demographic groups in thought units as indicated by Cross-tabs, chi-squared analysis using SPSS

Function	Secondary Category	X ²	Sigma	Significant Difference
Containment	-	11.937	0.003	Yes
Protection	-	14.350	0.001	Yes
Communication	Transparency, Size, Etc.	1.863	0.394	No
	Labeling	11.917	0.003	Yes
Utility	Use	43.616	0.000	Yes
	Storage	12.379	0.002	Yes
	End Use	19.504	0.000	Yes

i. Containment

Units coded for containment accounted for 6.64% (n=126) of the total thought units, with 41-51 year olds accounting for 26.9% (n=34), 24-29 year olds accounting for 50.8% (n=64), and mothers accounting for 22.2% (n=28) of the units. The chi square analysis showed there was a significant difference among the distribution of thought units over the demographic groups ($\chi^2=11.937$, sigma=0.003)

ii. Protection

The thought units coded for the protection function accounted for 4.53% (n=86) of the total thought units in this project. The 41-51 year olds accounted for 46.5% (n=40) of the thought units coded and the 24-29 year olds accounted for 39.5% (n=34) of the thought units. The mothers with children seemed to be less concerned with the protection function than the other demographic groups as they accounted for 13.9% (n=12) of the thought units. Chi square analysis indicates there was a significant difference between the demographic groups of the distribution of thought units ($\chi^2=14.350$, $\sigma=0.001$)

iii. Communication

The communication function overall accounted for the most thought units at 53.2% (n=1011). This means that over half of the units coded for fell into this category.

a. Transparency, Size, etc.

This sub category accounted for 19.8% (n=376) of the total thought units coded. Under this subcategory, the demographic groups were distributed fairly evenly in their thought units. The 41-51 year olds accounted for 29.5% (n=111) of the thought units, the 24-29 year olds accounted for 37.2% (n=140), and the mothers accounted for 34.3% (n=125) of the thought units. Chi square analysis indicates there was no significant difference in the distribution of thought units over the demographic groups ($\chi^2=1.863$, $\sigma=0.394$).

b. Labeling

This sub-category accounted for 33.4% (n=635) of the total thought units coded in this study. The thought units were again distributed fairly evenly across

the demographic groups. The 41-51 year olds accounted for 37.8% (n=238) of the thought units, the 24-29 year olds accounted for 33.4% (n=212) and the mothers accounted for 29.5% (n=185) of the thought units. Chi square analysis among these groups indicate there was a significant difference in the distribution of thought units ($\chi^2=11.917$, $\sigma=0.003$).

iv. Utility

a. Use

Thought units for the utility category mostly fell into this subcategory. Use accounted for 76.1% (n=401) of the thought units coded for utility. The 41-51 year olds accounted for 22.9% (n=92) of the thought units, the 24-29 year olds accounted for 32.9% (n=132) of the thought units, and the mothers accounted for 44.1% (n=177) of the thought units. Chi-square analysis indicated there was significant difference with the distribution of thought units among the demographic groups ($\chi^2=43.616$, $\sigma=0.000$)

b. Storage

The distribution across demographic groups was not even for this category. 41-51 year olds accounted for 24% (n=11) of the thought units, 24-29 year olds accounted for over half the thought units at 60% (n=27), and mothers with children accounted for 15.6% (n=7). The chi square analysis indicated there was again a significant difference among the demographic groups with the distribution of thought units ($\chi^2=12.379$, $\sigma=0.002$).

c. End Use

The distribution across the demographic groups was fairly even for this sub-category. The 41-51 year olds accounted for 54.3% (n=44) of the thought

units, the 24-29 year olds accounted for 21% (n=17), and the mothers accounted for 24.7% (n=20) of the thought units. Chi square analysis indicates there was a significant difference between the distribution of thought units across the demographic groups ($\chi^2=19.504$, $\sigma=0.000$).

v. Other

The other category only accounted for 7.8% of the total thought units coded for this study. The distribution across the demographic groups was distributed unevenly. The 41-51 year olds accounted for 28.9% (n=43) of the thought units, the 24-29 year olds accounted for 47% (n=70) of the thought units, and the mothers accounted for 24.2% (n=36) of the thought units. Chi square analysis indicates that there was a significant difference among the demographic groups of the distribution of thought units ($\chi^2=7.776$, $\sigma=.020$)

Observations of the distribution of thought units indicate communication and utility were the two most talked about categories. Labeling appeared to be the most talked about overall; however this was the case in all of the demographic groups. The 41-51 year olds tended to have more thought units regarding protection, labeling, and end use. 24-29 year olds tended to have more thought units in regard to containment, transparency, size, etc., storage, and the other categories. The mothers had the most thought units in regard to use

IV. Focus group Discussion Findings

Through attributes, the package can convey different messages to the consumer about the package and the product itself. Several themes developed throughout the course of each focus group and some of these themes varied by group (See appendix F for organized table).

i. Containment

Generally, the glass bottle was thought as capable of containing the product through almost all situations, but some participants concerns focused on the sturdiness of the package. Many consumers mentioned that glass is breakable and depending on the situation of use, they may consider an alternative package. Plastic many times was mentioned as durable. Participants were not afraid the PET bottle or HDPE bottle would leak or break. The aluminum bottle was also characterized as durable, and several of the 41-51 year olds mentioned that it was sturdy and could be used in situations like going to the gym, camping, or hiking.

The gable top carton was mentioned by some of the participants to not adequately contain the product in certain cases. They felt it was not durable and, therefore, not a very good package. "It can get broken in the back of the car" and "it could get punctured," were statements heard. Some participants thought the package could easily be damaged enabling the product to leak out.

The flexible pouch and the brick pack were two packages that many of the participants felt were inferior with regard to product containment. Many of the participants stated these packages leaked, and could easily be pierced. A

characteristic quote of this issue indicates, "... they [pouch] get punctured, and they'll leak out."

ii. Protection

Participants were interested in a product that was fresh and disliked that interacted with the product. Taste of the product was a key attribute in determining whether the package had migrated into the product or any compounds of the product had sorbed out. Participants indicated the glass bottle to be an ideal candidate to protect the product from the environment and that the package was not likely to affect the product. Many of the consumers voiced that glass was pure, clean, and would not interact with product. Characteristic quotations from focus groups included, "Things taste better out of glass," and "I've never had a bad bottle of juice in glass."

Some of the other packages were thought to not protect the product as well. Most of the consumers seemed to believe that things packaged in plastic tasted like the plastic itself. It was suggested that plastic commonly "transfers" into the product and leaves a residue which results in a plastic-like taste. Off-flavor was a theme in the discussion about gable topped cartons, as well. This idea generated negative perceptions about products that tasted more like the package than the product being consumed.

Several participants from the focus group that consisted of mothers also tended to see gable-topped cartons as packages that could puncture easily or break. The flexible pouch and brick pack were also thought to be the worst at protecting the product. Participants mentioned the pouches were easily "squished" and the brick packs got soggy when exposed to moisture.

Participants expressed concerns regarding the protective attributes of the aluminum bottle, indicating that due to the material, the temperature of the package and product could change rapidly. They suggested that this may lead to fluctuations in and out of the ideal temperature range, possibly damaging the product. Aluminum was also thought to leach into the product during these temperature changes by some of the mothers with children.

iii. Communication

Different types of packaging seemed to communicate a huge amount to the consumers. A large number of comments fell into this category and this is consistent with the approach used for data coding.

a. Transparency, Shape, and other features

One dominant theme across all the focus groups was the need for transparency of the packaging. Participants were very interested in seeing what the product looked like. Participants indicated that if they could see the product for themselves, they had a better understanding of the type of product that they were getting. They wanted to judge the color, the consistency, and condition of the product before purchasing it, especially if it was a juice that they had not purchased previously.

This translates into how they may feel buying that product and has the potential to predict how content they will be with their decision to purchase. As the only two transparent packages presented in this study, the glass bottle and PET bottle were mentioned frequently as best in aiding the consumers to connect with and judge the product itself and not just the package.

The importance of the idea of transparency became even stronger after the consumers were asked about packaging for cherry juice. Statements such as, "You want to see what it looks like," and "I would want it to be clear, to see the color of the juice" were characteristic of all groups as the discussion of packaging for cherry juice. In general, participants wanted to see a new product or something they were unfamiliar with before purchasing it. "If it's something I've never bought before I want to see it before I buy it."

Each package type and shape appeared to communicate different things to the participants. Frequent words triggered by the glass bottle were "healthy," "natural," "quality," and "expensive." Many participants mentioned products that were healthy typically came in glass, and that it was a "natural package." While many of the participants saw glass as higher quality, they also believed that it was more expensive. Most translated that to mean that it contained a higher quality product, which some were willing to pay more for, while others were not.

Some of the participants viewed the PET bottle more positively because of its structure and the embossing on the bottle. Some consumers mentioned that more time and money spent on the package for a product indicated a better product. "I like the way it looks, and the design, its aesthetically pleasing," was a characteristic quote of the plastic bottle.

Several participants made comments about the gable top carton as "THE juice package." It was characterized by some participants as, "the thing that morning stuff comes in." Many of the 24-29 year olds felt the gable topped carton was a typical package for juice, indicating that they expected there to be something healthy inside. "The box seems natural, like I'd be having a teaspoon

of it every morning,” was a quote made to support this idea. Mothers with children, like the 24-29 year old participants, indicated the gable-topped carton to be a typical juice package.

The HDPE bottle drew some interesting comments in regard to its shape. Several people identified it as a milk package, which was both positive and negative. One participant commented, “The 50s... it reminds me of how the moms go and change the milk bottles,” which brought a connection with the past and a feeling of nostalgia. However, another participant connected it with a current milk package, and a product with which she had had negative experiences.

Judging from the comments made and the rankings it received from the participants (see Tables 5 and 6), aluminum was the least liked bottle. Several comments were made about its lack of transparency and how it appeared to look like a package for Sterno, or for cleaning products. The comment “aluminum is the last thing that healthy things come in,” was supported by several participants in one group of 24-29 year olds and echoed across all the other groups. However, the bottle did earn some positive feedback with the suggestion that it was a new and interesting package that might be ideal for a new product. Mothers with children seemed to think their children might respond more positively to it than the other packages. They mentioned the shininess and “cool” look of the bottle would catch their child’s attention and they might want to try it. “They’d like it because its cold and you can’t see what’s in it. It’s cool,” were quotes that supported this idea.

The brick pack and the flexible pouch earned the least positive responses from participants of all focus groups. It was mentioned in EVERY focus group session that the brick pack signified “kids,” or products that were composed primarily of sugar and water. One participant passionately mentioned the brick pack, “Makes me feel like a little kid in a bad way, I’m an adult now, I don’t drink out of this!” Another stated that, “It makes you look five.” The negative response to the brick pack increased when the consumers were asked to think about the best way to package cherry juice.

The pouch evoked a different set of responses. Among them were “space age,” “robotic food,” and unhealthy, and “[it] looks like something you’d hook up to an IV.” Although the mothers with children tended to be less harsh than the other two groups, overall, the participants indicated they did not see the pouch as a juice package.

Overall comments regarding the ways that a package can convey health included: keeping it simple, but also, if it looked like more money and time was spent in creating a package, the product was probably of higher quality and healthy. Many of the participants, especially the 41-51 year olds, said that if a package was too trendy or flashy, that would indicate an unhealthy product to them.

b. Labeling

Although all packages presented to participants were unlabeled, participants were asked what a label could do to indicate a healthy product to a consumer. Since the label is ultimately part of the package, it was discussed as an avenue to send a message to consumers.

1. Labeling in general

Some common themes among the participants included the need for a natural looking label that was simple, with clearly stated nutritional facts that were convenient to read and identify. Across the focus groups, the color pallet of the label was suggested to be in natural colors with fresh looking graphics. The word “organic” also seemed to indicate to the participants a healthy product.

The mothers with children and 24-29 year olds seemed more interested in putting fun facts about health on the label that might teach the consumer about the product. However, crazy colors and busy graphics were not thought to indicate a healthy product. “If I see fire crackers and stars and hearts - I don’t want to feel like that on the inside.”

2. Labeling for cherry juice

Once the packages were indicated to have cherry juice as the product, (Figure 4, step number 12) consumers were asked again about what labeling could do to promote a healthy message. During the focus groups, the words “antioxidant,” and “heart healthy,” were mentioned. The participants indicated those words should be clearly stated on the package in large letters. In each of the groups, it was suggested a heart be present on the package, and that any health claims of the product should be certified or backed up by a credible source. Participants from all of the groups indicated they did not want gimmicky, flashy, or child like labels for the product. It was also mentioned by participants from all of the groups, even the 24-29 year olds, the labels need to be clear and easy to read. Several participants from all of the groups made comments about difficulty reading the fine print on many of current labels.

iv. Utility

The different types of packaging were also discussed in depth by means of their performance, features for using the product, and the package itself as part of the product. Again, a large number of comments fell into this category and are discussed according to the way they were broken down for coding.

a. Use of the Product

Across all the groups, “easy to use” was mentioned frequently. Participants liked packages that were easy for them to handle, carry, use to dispense product, open, and reclose. Difficult packaging in general received a negative response. Of the packages presented, most of the participants across the focus groups liked the brick pack the least. They were considered difficult to open, the straw got lost or breaks, they squirted everywhere, were messy, or there was always a little bit of product left over in the package.

Some participants found the gable-topped carton to be considered difficult to open, “The ones that have a little white thing to pull out the ring, my kids can’t get them out.” The cartons were also seen by some of the participants in each of the groups as spillable, not good for on the go, inconvenient, not durable, and sometimes difficult to use. They did however, think the product was easily dispensed, and the package fit nicely in the refrigerator.

Although not present in this group of packages, the larger plastic jugs with handles were mentioned across all of the groups. The participants liked these packages because they were easy to carry, and the handle aided in dispensing of the product. Most participants indicated liking the package because it was a large quantity and easy to use.

The PET bottle was also liked for its indentations because most of the participants felt it was easy to hold. Its compactness and lightweight were commented on as, again, making it easy to use. The weight of the HDPE bottle and aluminum bottle were also mentioned as light. However, they were mentioned to be slippery and not as easy to use in all of the focus groups.

b. Storage

If the product was not to be consumed in one use, it needs to be stored for later. Most commonly, the gable top carton was mentioned as easy to stored in the refrigerator. The reclosable pour spout made it easy for participants to seal it and save for later. The aluminum bottle, glass bottle, and PET bottles were also indicated as packages that could easily be reclosed and the product could be saved.

The glass bottle, however, was not considered something that would travel well in a back pack or sit in the refrigerator at work, and not necessarily something participants wanted to carry with them. They worried about dropping or breaking it. The PET bottle and aluminum were seen much more favorably in this light, because they were durable and would not crack.

The flexible pouch and brick pack were viewed as to be light and easy to carry in a backpack or lunch box. For hiking they were considered lightweight, and in school lunches they can lay flat and fit easily into a box or bag. However, participants in the 24-29 year old group worried about the flexible pouch being punctured if it was thrown in their backpack. The key problem that consumers saw with these packages was that they were not made for storage and there is not a good way to reseal them and keep the product for later.

c. End use

In every focus group, recycling or recyclable packaging was mentioned frequently. Participants seemed to link recyclable packaging and healthy products. In the participants minds eco-friendly indicated “good for earth” and good for them. Across all the groups, the participants seemed concerned with environmental friendliness of packaging. Glass was seen as the most recyclable package. Although participants indicated they looked for the recycling symbols on plastic containers, it seemed as though they sometimes had difficulty recycling plastic.

In addition to recycling, participants were interested in packages they could reuse. The aluminum bottle was mentioned several times as a re useable container, as was the PET bottle. However, some health concerns arose with the PET bottle, because participants were worried about the plastic migrating into the product. To a lesser extent they expressed the same concern regarding the aluminum bottle. “You’re not supposed to store stuff in aluminum, its toxic,” was a comment made by one 24-29 year old.

Comments about the inability to recycle the brick pack and flexible pouch were made by a few participants. The brick pack was thought to be a lot of packaging for the product and the pouch was, “something that has to be thrown away and you pay for it.” Although the gable top carton was also not recyclable, some of the participants mentioned that it was renewable energy which made them like it more than the brick or pouch.

V. Means End Chain For Cherry Juice

Compiling the attributes discussed that participants would look for in a package for cherry juice with nutraceutical benefits, a means end chain was developed from the focus groups (see figure 7). The attributes in a package most important to the participants lead them to their ultimate goal of being healthy. Purchase intentions are likely to be high as a package with these attributes fulfills the customer's means-end chain. The means end chain identifies the attributes most commonly mentioned during the focus groups and connects them with the functional and psychosocial consequences they obtain from those attributes. The chain further connects those consequences to the values of the participants identified in this study.

Means End Chain for Cherry Juice

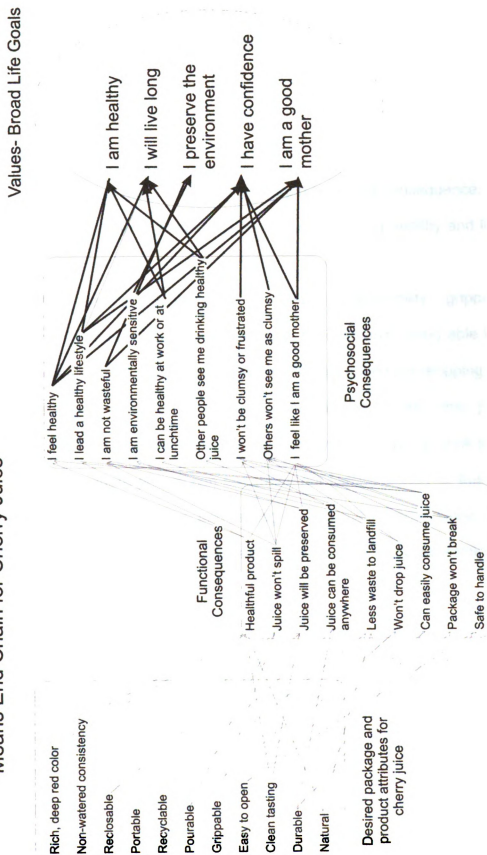


Figure 15: Means end chain for cherry juice packaging

A consumer, who can see the deep rich red color of the cherry juice, as well as the consistency of the product, leads him or her to believe he or she is drinking a healthful product. This attribute of transparency has the functional consequence of enabling a consumer to think he or she is drinking a healthy product. This leads the consumer to thinking they are leading a healthy lifestyle and allows him or her to feel healthy; the psychosocial consequence. Finally this leads the consumer to their end state or goal or being healthy and living a long time.

Attributes like portability, pourability, recloseability, grippability, and durability, have functional consequences of a consumer being able to consume the juice easily and anywhere, preserving the juice, and not dropping or breaking the package. These functional consequences create the psychosocial consequences of the consumer feeling healthy, being able to drink juice at work or lunchtime where people can see them, not feeling clumsy or frustrated when dealing with the packaging, and feeling like a good mother. Once again, these consequences lead into the values of the consumer of having confidence, being healthy, living long and being a good mother.

The recyclability and naturalness of the package create less waste that might end up in a landfill and make the consumer believe they are drinking a healthy product. These functional consequences lead into the psychosocial of preserving the environment, being environmentally sensitive, in addition to feeling healthy. The values reached from these consequences are preserving the environment, and again being healthy, and living long.

Finally, a clean tasting product that is in an easy to open package were among the attributes the participants looked for when considering cherry juice. The clean taste relates to a package that does not interact with the product, which indicated to the consumer a healthy product and preservation of the juice. These functional consequences lead to the psychosocial consequences of feeling healthy, leading a healthy lifestyle, not being wasteful and being environmentally sensitive. Arriving at the end state or goals of being healthy, living long, preserving the environment, the consumer reached his or her values through these attributes. A package that is easy to open leads the consumer to easy consumption and not feeling clumsy or becoming frustrated while consuming the juice; the functional and psychosocial consequences of the attributes. These consequences lead the consumer to their final goals or values of having confidence.

Chapter 6 -Discussion

From the data collected, it was observed that packaging plays an enormous part in consumer perception of the product. If the package does not aid the product in meeting the consumers' unmet needs or fulfill their values (see Figure1), it is likely the consumer will not purchase it. Features of the package indicate to a consumer how easy the product will be to use, store, and throw away. The package can suggest whether or not the product will taste fresh or if it has adequately protected the product from the outside environment. It can suggest if the product has experienced contamination or tampering.

In addition, the package can tell a story about the product itself, suggesting if the product is of high quality or just "sugar water." A package can suggest to a consumer if the product is expensive or economical. Throughout this study, it became apparent consumers need a package that contains and protects the product, but this package must also be useful to them and communicate a positive message.

From the discussion in the focus groups, a means end chain was developed for cherry juice. The attributes mentioned most frequently indicated consumers wanted a package that was transparent, portable, recyclable, pourable, grippable, easy to open, inert, durable, and natural. These attributes led to functional consequences which the participant evaluated to see if the package would meet their needs. The participant then assessed the psychosocial consequences, again to see if they would end up at the end state or goal the consumer was targeting. If the attributes lead all the way to the consumer's values, the package was successful and the consumer saw it more

positively. These attributes led to the consumer's values of being healthy, living a long time, preserving the environment, having confidence and being a good mother.

The main attribute the participants looked for in a package was the ability to see the color and consistency of a product. Over 73% of the participants selected a transparent package for cherry juice. Transparency allows the consumers could judge for themselves the product inside. The consumers feel like they have all of the information necessary to make a good decision. If the consumer feels they are getting a deeply colored product with good consistency, they believe it to be a healthy product which enables them to feel healthy and lead a healthy lifestyle. In turn, if they are healthy, or others see them as healthy, they ultimately feel healthy and that they will live longer. Additionally, mothers who could see the product and judge for themselves could feel they were giving a good product to their child. In doing so, they feel they are a good mother, and will reach the ultimate end state of being a good mother.

In the analysis of thought units, the number of units categorized as transparency, size, and other features of packaging, accounted for 19.80% (376 units out of 1899) of the total thought units created in this study. This means the participants frequently mentioned this topic, indicating that these features had a large impact on their perception of products. The results also show that for every category, with the exception of Transparency, Size, etc. ($\chi^2=1.863$, $\sigma=0.394$) there was a significant difference between the demographic groups in the number of thought units for the category. This could be due to the fact that it was frequently talked about and all the participants paid a lot of attention to the

attributes associated with this function. These results indicate that transparency may have a huge impact on consumer perception of a product.

The results from the rank order show that glass was the best liked package before and after discussion of cherry juice. Thirty participants (79%) selected it as the best liked package after discussion of cherry juice where, 16 had selected it before the discussion of cherry juice. Comments made during the focus groups support the idea that consumers wanted to see the product they were getting, particularly if it was something they had not tried previously. The shift from before discussion to after discussion, although it was marginally insignificant, ($\sigma = 0.057$) indicates the package has an impact on the perception of the product.

The preference for transparent packaging may also indicate why the PET bottle was the second best liked for cherry juice. Twelve of the participants selected it as the best like package for cherry juice and 20 selected it as the second best liked (ranking it 2.00). The PET bottle was liked just as much as glass by the mothers. Tying this back to the means end chain the mothers wanted a package that would be safe to give to their children. A durable package that would not break or be potentially harmful for their child had a strong impact on the mother's perceptions.

Although the gable top carton was not considered as durable as some of the other packaging presented, seven participants selected it as the best liked package for cherry juice, making it the third best liked package. Some participants indicated they felt the gable top carton could get punctured or could break easily. But the preference for this package could be explained by its

reclosability. This feature enables the consumer to preserve the contents and save it for later use. Relating this to the means end chain, the consumer would reach their end value of preserving the environment by not being wasteful. Not only did it meet these needs but the gable top carton was considered a common juice package by many of the participants. The perception of the gable top carton was that something healthy came inside and this is supported by the rank ordering.

The reclosability of the gable top carton was an attribute associated with the utility function of packaging. The utility function accounted for 27.76% (527 out of 1899 units) of all the thought units created in this study. Other attributes included in this category, that the consumers required for a package for cherry juice, were portability, grippability, ease of opening, pourability, durability, and recycle ability of the package. The attributes in this category were the second most frequently mentioned, indicating consumers rely heavily on these features to aid them in reaching their means end. Using the means end chain, these attributes are associated with a consumer being able to use, store, and dispose of a package easily, without them feeling clumsy or frustrated. Ultimately, fulfilling these needs, the consumer reaches his or her end state of having confidence.

The attribute of recycle ability was frequently mentioned, and had a strong connection with the way consumers perceived a product. "And I would say recyclable I if it's healthy for the environment, it is healthy for us," was one of many comments connecting a recyclable package with being healthy. The participants reached their end goals of preserving the environment through

packages that were good for the environment, along with feeling like there was a healthy product inside.

The lack of recyclability created a negative perception about some of the packages, including the flexible pouch and the tetra brick. These packages were ranked the least liked for cherry juice with 25 participants selecting the flexible pouch as their least liked and 13 participants selecting the tetra brick as their least liked. Also, not a single participant gave the brick pack a ranking of 1.00 (best liked) for the product of cherry juice. Not only the lack of recyclability of these packages resulted in these low scores, but comments were also made about the difficulty in using them, lack of reclosability, and general look. "It's (brick pack) not resealable, so if I cannot finish it off, It's very uncomfortable to carry with you, I don't like it," was one of many comments supporting these ideas.

Attributes that fell into the communication category, (53.2% of all thought units coded) again show an impact on consumer perception of a product. The brick pack was among the least liked packages due to its lack of desirable characteristics. However, it was also extremely disliked from what it communicated to the participants. Several times comments about the appearance and the idea that it indicated "kids" and "sugar water" we made. Additionally, the flexible pouch and aluminum bottle were said to be unhealthy looking packages, giving the consumer the perception that an unhealthy product was inside. This perception signals that using these packages will not enable the consumer to reach his or her values.

Among the last attributes mentioned, natural packages with a clean tasting product were characteristics the participants wanted for cherry juice. The

inertness of a package was a key attribute that consumers perceived indicated a healthy product. Glass was frequently mentioned as a pure material that did not interact with the product, which may indicate why glass performed so well for the rank order of packages for cherry juice. This also may explain why the PET bottle performed not as well, because several consumers indicated they could taste the plastic in the product. The plastic taste to the consumers indicated an unhealthy product, and using the means end chain those attributes would not enable them to reach the ultimate goal of being healthy and living a long time.

Within the context of this study, each demographic group was chosen to see if there was a difference between the groups and the attributes they look for in healthy juice packaging. Mostly similarities developed, however it was mentioned at least once in each focus group that it depended on the situation as to which package they liked the best and would choose. The mothers with children displayed this thinking frequently when thinking of packaging appropriate for their children. As previously stated, the mothers were not only concerned for their own health, but for their child's safety as well.

The analysis of the thought units also indicates that there were some differences among the demographic groups. The 24-29 year olds appeared to be more concerned with the containment of the product, while the 41-51 year olds appeared to be more concerned with the protection of the product. However the attributes associated with these functions were mentioned only minimally; containment accounted for 6.64 % of the overall thought units and protection accounted for 4.53%.

The thought unit analysis also indicates that labeling was the category most comments were categorized as across all focus groups (33.4% of communication overall). The comments from the focus groups indicate the consumers felt there were many things a label could do to indicate a healthy product. While labeling was discussed at length during the focus groups, the packages presented did not have labels. Yet, the discussion that occurred provided insight on how to best convey healthy properties to a consumer. The participants mentioned simple, natural looking labels, with clearly stated facts and benefits, backed by a credible source to be the best way to convey the healthful attributes of cherry juice. These would lead them to believe the product is healthy, allowing them to feel healthy and lead a healthy lifestyle, and ultimately be healthy.

Although some packages had specific attributes that lead the consumers to their values, other factors should be investigated to indicate behavior. Price was a major driver for many of the consumers. The glass bottle was the best in meeting their needs and values for a package for cherry juice. However, due to the fact that glass is an expensive material, some of the participants indicated they would probably not buy it. The participants who were price sensitive seemed to choose the PET bottle for cherry juice. How the participants indicated they would act compared to how they would actually act, would provide more understanding of the drivers behind consumer behavior.

Chapter 7 - Conclusions

The results of this study indicate that the different attributes of packaging have an effect on consumer perception of a product. When shopping, consumers look for specific attributes to achieve their end goals or values of the means end chain. They encounter and view differently the various packaging attributes that fulfill the functions of containment, protection, communication, and utility. These different views enable them to decide which package and products will meet their goals, and, ultimately, influence their intention to purchase.

The objectives stated at the beginning of this project were met:

- ▲ Identify how different types of beverage packages may influence consumer's perception of a product
- ▲ Provide information and evidence to the cherry industry about the impact beverage packaging may have on consumer perception of cherry juice; and

The results from the packaging rank order indicate that different beverage packages influence consumer perception a product. The significant shifts of the packaging rank order from before to after the discussion of cherry juice, show that consumer perception changed when a product context was applied. Significant downward shifts in packaging rank ordering was observed for the aluminum bottle ($\chi^2= 58.365$, $\sigma= 0.011$), the HDPE jug ($\chi^2= 52.960$, $\sigma= 0.034$) and the flexible pouch ($\chi^2= 70.095$, $\sigma= 0.00$).

From the analysis of thought units it is clear that communication is a huge function of packaging that consumers recognize. The units categorized as communication, with the sub category of transparency, size and other packaging

features, were the most frequently mentioned. They accounted for over half (53.2%) of the thought units in this study. This indicates the different attributes of communication function may influence the way a consumer perceives a product. Supported by the comments of the focus groups, different packages, with different attributes have an effect on how a sees a product.

^ Develop a Means End Chain for cherry juice

The Means End Chain created for cherry juice shows that consumers want a transparent, simple package that is easy to use, reclose, store, and recycle. While there are some differences in the way certain demographic groups view packages, there are strong similarities that can be used for future designs. Overall, the glass bottle was the package best liked for cherry juice. It fulfilled the need for attributes like transparency (being able to see the color and consistency), a natural package, durable, pourable, recycleability, inertness (clean taste) reclosability, ease of use, and portability. The participants felt this package best fulfilled their needs when shopping for cherry juice. These attributes lead to functional consequences where they could consume a healthy product, easily, anywhere, would not spill or drop it, preserve the juice, which creates less waste and it is safe to handle. These consequences lead them to psychosocial consequences which include feeling healthy, leading a healthy lifestyle, not being wasteful, preserving the environment, feeling like a good mother, and not being clumsy or frustrated, and preventing others from seeing you that way. Ultimately, these consequences lead them to their end state of

being or values; being healthy, living longer, preserving the environment, having confidence and being a good mother.

Chapter 8 - Research limitations

There exist limitations in several areas of this project. The packages for this project were used as a result of available packages from another study, in addition to existing packages in the market place. The flexible pouch and the brick pack were obtained from commercial markets, they had printed labels. To ensure consistency across all treatments, these products had to be altered so that their text and graphics were not apparent. Although care was taken in treating the packages, it potentially affected participants' perception of the packages. At one point, a participant mentioned the flexible pouch looked as if it had been spray painted at home. Finally, each participant was supposed to receive one of each type of package for the focus group. However, researchers were only able to obtain eight flexible pouches and eight gable top cartons, as a result, participants had to share these treatments, while participants each received their own package for the remaining treatments. This may have made it difficult for them to visualize and rank order the packages.

A convenience sample was pulled from the campus area. As such, findings are not generalizable to the population at large. Eighty percent of the participants (46 out of 59) completed a college degree or higher while almost 37.3% (22 out of 59) completed a graduate degree or higher. The participants in this sample were fairly well educated in comparison to the total U.S. population. The in 2006 census reported that 28% of adults 25 years and older had received at least a bachelor's degree (U.S. Census Bureau 2006).

In addition, 21 out of the 59 (35.6%) participants had tried or regularly drank cherry juice. This may have influenced their package rank order as they

may have been familiar with packages commonly used for cherry juice. They also may have been affected by whether or not they like the product. Finally, although this study did not try to target participants who were connected with Michigan State University, due to the recruitment techniques and location, many participants were affiliated with the University. Since several studies indicating the beneficial properties of cherry juice has been conducted at Michigan State University, and because the University is home to the School of Packaging, it is suspected that the participants involved in this study may have had more knowledge on these topics than the general population. However, no one with a background in Packaging participated.

Analysis of the information collected may have experienced some error. Out of 59 participants, two sets of data from the package rank ordering exercise had to be thrown out due to the participants' lack of understanding of how to perform the task. At least one participant rated the packages 1 through 7 rather than rank them. As a result, multiples of numbers occurred in the first and second rank ordering, which made the data unusable. One more participant simply did not answer the second rank order, and therefore that data had to also be thrown out. In addition, several participants did not turn in their rank order sheets, resulting in some missing data.

Although frequencies of the categories of thought units were found, this does not necessarily indicate the most important topics discussed. Although some topics were discussed more than others, it was apparent that sometimes an extremely important topic may have only been mentioned once, but with extreme intensity. As much as possible powerful comments were noted and

the first of these is the fact that the
the second is the fact that the
the third is the fact that the
the fourth is the fact that the
the fifth is the fact that the
the sixth is the fact that the
the seventh is the fact that the
the eighth is the fact that the
the ninth is the fact that the
the tenth is the fact that the
the eleventh is the fact that the
the twelfth is the fact that the
the thirteenth is the fact that the
the fourteenth is the fact that the
the fifteenth is the fact that the
the sixteenth is the fact that the
the seventeenth is the fact that the
the eighteenth is the fact that the
the nineteenth is the fact that the
the twentieth is the fact that the
the twenty-first is the fact that the
the twenty-second is the fact that the
the twenty-third is the fact that the
the twenty-fourth is the fact that the
the twenty-fifth is the fact that the
the twenty-sixth is the fact that the
the twenty-seventh is the fact that the
the twenty-eighth is the fact that the
the twenty-ninth is the fact that the
the thirtieth is the fact that the
the thirty-first is the fact that the
the thirty-second is the fact that the
the thirty-third is the fact that the
the thirty-fourth is the fact that the
the thirty-fifth is the fact that the
the thirty-sixth is the fact that the
the thirty-seventh is the fact that the
the thirty-eighth is the fact that the
the thirty-ninth is the fact that the
the fortieth is the fact that the
the forty-first is the fact that the
the forty-second is the fact that the
the forty-third is the fact that the
the forty-fourth is the fact that the
the forty-fifth is the fact that the
the forty-sixth is the fact that the
the forty-seventh is the fact that the
the forty-eighth is the fact that the
the forty-ninth is the fact that the
the fiftieth is the fact that the
the fifty-first is the fact that the
the fifty-second is the fact that the
the fifty-third is the fact that the
the fifty-fourth is the fact that the
the fifty-fifth is the fact that the
the fifty-sixth is the fact that the
the fifty-seventh is the fact that the
the fifty-eighth is the fact that the
the fifty-ninth is the fact that the
the sixtieth is the fact that the
the sixty-first is the fact that the
the sixty-second is the fact that the
the sixty-third is the fact that the
the sixty-fourth is the fact that the
the sixty-fifth is the fact that the
the sixty-sixth is the fact that the
the sixty-seventh is the fact that the
the sixty-eighth is the fact that the
the sixty-ninth is the fact that the
the seventieth is the fact that the
the seventy-first is the fact that the
the seventy-second is the fact that the
the seventy-third is the fact that the
the seventy-fourth is the fact that the
the seventy-fifth is the fact that the
the seventy-sixth is the fact that the
the seventy-seventh is the fact that the
the seventy-eighth is the fact that the
the seventy-ninth is the fact that the
the eightieth is the fact that the
the eighty-first is the fact that the
the eighty-second is the fact that the
the eighty-third is the fact that the
the eighty-fourth is the fact that the
the eighty-fifth is the fact that the
the eighty-sixth is the fact that the
the eighty-seventh is the fact that the
the eighty-eighth is the fact that the
the eighty-ninth is the fact that the
the ninetieth is the fact that the
the ninety-first is the fact that the
the ninety-second is the fact that the
the ninety-third is the fact that the
the ninety-fourth is the fact that the
the ninety-fifth is the fact that the
the ninety-sixth is the fact that the
the ninety-seventh is the fact that the
the ninety-eighth is the fact that the
the ninety-ninth is the fact that the
the hundredth is the fact that the

recorded. However, to identify the most important issues, a scale rating the importance of topics to participants should have been developed.

Finally, due to the nature of this study, it is possible that participants may not have been completely truthful in their answers. While they were asked to write down their packaging rank orders before revealing them publicly, participants may have changed answers when witnessing what other participants selected. Fern and Bristol (2006) suggest that information gathered in focus groups may be more generalizable toward the setting than during a consumption and purchase process. This suggests participants may have acted differently in this focus group setting than out in the market place.

Chapter 9 - Future research

With several companies focusing more on the consumer when designing packaging, quantitative and qualitative techniques for interpreting consumer behavior are increasingly important. Various projects can be created with this research as a basis.

- A quantitative experiment based on the results of this study that investigated the research questions on a larger scale
- A similar experiment with participants from all different demographic groups
- A project based on the findings of this research could be done that designed and compared several different packages that have the most commonly mentioned packaging attribute in this study, including one that is
 - Transparent,
 - Reclosable,
 - Simple,
 - Durable
 - Easy to use and store, and,
 - Recycleable.
- An ethnographic study could be developed to examine the actual usage, storage and disposal conditions of the various packages. This study could then be repeated to examine which package consumers preferred.
- A similar study, including the packages mentioned by consumers which they did not see present; which include a high density polyethylene jug with a handle, frozen, concentrated juice in a

composite can, aluminum cans with a pop top, small aluminum cans with a pull tab, and large plastic juice containers like those for Ocean Spray™.

- **A study in which the consumers were asked to list attributes of a package that indicated to them “healthy” or “nutraceutical properties,” before being exposed to any packages.**
- **A study in which the packages all had the same, generic label for cherry juice.**

APPENDICES

Appendix A

Screening Questionnaire

1000

1000

Appendix B

IRB approval letter and IRB approved Moderator Guide

MICHIGAN STATE
UNIVERSITY

Initial IRB
Application
Approval

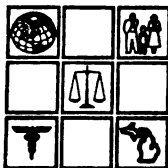
August 8, 2007

To: Laura BIX
153 Packaging Building

Re: IRB # 06-844 Category: EXPEDITED 1-2, 2-6
Approval Date: November 17, 2006
Expiration Date: November 16, 2007

Title: IMPACT OF PACKAGE TYPE ON CONSUMER PERCEPTION OF A PRODUCT

The Institutional Review Board has completed their review of your project. I am pleased to advise you that **your project has been approved.**



This letter is to reflect that Audrey Whaling is listed as a study investigator for this project.

The committee has found that your research project is appropriate in design, protects the rights and welfare of human subjects, and meets the requirements of MSU's Federal Wide Assurance and the Federal Guidelines (45 CFR 46 and 21 CFR Part 50). The protection of human subjects in research is a partnership between the IRB and the investigators. We look forward to working with you as we both fulfill our responsibilities.

Renewals: IRB approval is valid until the expiration date listed above. If you are continuing your project, you must submit an *Application for Renewal* application at least one month before expiration. If the project is completed, please submit an *Application for Permanent Closure*.

Revisions: The IRB must review any changes in the project, prior to initiation of the change. Please submit an *Application for Revision* to have your changes reviewed. If changes are made at the time of renewal, please include an *Application for Revision* with the renewal application.

Problems: If issues should arise during the conduct of the research, such as unanticipated problems, adverse events, or any problem that may increase the risk to the human subjects, notify the IRB office promptly. Forms are available to report these issues.

Please use the IRB number listed above on any forms submitted which relate to this project, or on any correspondence with the IRB office.

Good luck in your research. If we can be of further assistance, please contact us at 517-355-2180 or via email at IRB@msu.edu. Thank you for your cooperation.

Sincerely,

Peter Vasilenko, Ph.D.
SIRB Chair

c: Diana TWEDE
130 Packaging Bldg
MSU

OFFICE OF
REGULATORY
AFFAIRS
Human Research
Protection Programs

BIOMEDICAL & HEALTH
INSTITUTIONAL REVIEW
BOARD (BIRB)

COMMUNITY RESEARCH
INSTITUTIONAL REVIEW
BOARD (CRIRB)

SOCIAL SCIENCE/
BEHAVIORAL / EDUCATION
INSTITUTIONAL REVIEW
BOARD (SIRB)

202 Olds Hall
East Lansing, Michigan
48824-1046
517-355-2180
Fax: 517-432-4503

www.humanresearch.msu.edu
SIRB & BIRB: IRB@msu.edu
CRIRB: crib@msu.edu



MSU is an affirmative-action
equal-opportunity institution.

FOCUS GROUP MODERATOR GUIDE

I. INTRODUCTION

Did anyone have trouble parking or finding the room? Did everyone have a chance to use the restroom? Make sure you get yourself some more refreshments if you like before we start. And we are going to start soon so if you need to have that last cigarette, please do so now.

Hello and welcome. My name is Audrey and I will be your facilitator today. We are going to talk about packaging and what you guys think about it. I am interested in your personal perceptions, thoughts, and opinions. I am here to help keep discussion flowing and make sure everyone gets a chance to talk. If you feel that I am speaking too quickly or do not understand my questions, please feel free to tell me to slow down or ask me to clarify.

There are no right or wrong answers. I want you all to give your thoughts, so do not be afraid to speak up, even if you disagree, agree, or just have something to add. I am not looking for a consensus, just what you guys are thinking.

Just to let you know, only myself and my research team will be using this information for my project. However, we will be video recording this discussion, so that all thoughts and opinions may be heard. And it helps me to remember everything that was said, because I have such a bad memory! Additionally, there are two people observing behind that window to observe what we are talking about. Say hi and wave!

Does anyone have any questions? Ok, here we go!

II. WARM UP

a. Do you notice packaging when you are shopping? Do you ever think about packaging when you are buying something? Do you ever buy anything just because of the package?

III. Package Types

I am going to put some packages in front of you here on the table. I would like you to look at them and touch them if you like. On the paper I have given you please list them in order of the one you like most to the one you like least. (Each package will have a name and number)

Probe 1: Let's talk about your lists, how did you order them and why did you do it that way?

Probe 2: What features made it the package you liked the most?

Probe 3: The least?

Probe 4: What do you think the package says about the product inside?

b. What other beverage packages do you use that you do not see here?

Probe1: What do you like about that kind of package?

c. Do you drink juice?

Probe1: What kinds of juices do you drink?

Probe 2: When do you drink juice (ie with breakfast, with meals, between meals)?

Probe 3: Is there a certain kind of package you typically buy juice in? Why do you buy those kinds of packages?

Probe 4: Do you think the package sends a message about the product?

Probe 5: If so what?

d. What do you look (calories, price, health benefits etc) when you shop for juice?

Probe 1: Why do you look for (calories, price, health benefits etc when you buy juice?

Probe 2: Are you aware of the health benefits juice can offer?

Probe 3: Does that influence you to buy juice?

Probe 4: Would it influence you to buy juice if you were aware of the health benefits?

We all know that many food products these days can offer healthful benefits to consumers; I'd like to talk to you about how a package might communicate these benefits to a consumer.

e. What could manufacturers do to convey health benefits of a product to consumers?

Probe 1: What kinds of packaging do you think could communicate this feature/attribute to consumers?

e. Do you drink tart cherry juice? Do you know what is in it? (It is suspected that participants will volunteer knowledge about the healthy or nutraceutical properties of tart cherry juice. If not moderator will indicate that the tart cherry juice has these properties)

Probe 2: What kind of packaging could help communicate healthy benefits of tart cherry juice to consumers?

Probe 3: What kind of package might inspire you to buy tart cherry juice?

f. And finally today, I would like you to look once again at the packages in front of you. Imagine that they contain Tart Cherry Juice that is full of healthy benefits that can have a positive impact on your life. Now, I want you to rank the packages from the one you like the best to the one you like the least.

Probe 1: Why did you rank them in the order you did?

Probe 2: What perceptions do they give you about the product inside?

Probe 3: Which do you believe best communicate nutraceutical properties about the product?

Thanks so much for your comments today. I am investigating what different package types communicate to consumers about products. Do you have anything else you would like to add? Other comments, questions or concerns?

Thank you for taking the time today. I appreciate your participation. Please have some more snacks before you leave and thank you again.

Appendix C

Consent Forms

Consent Form 1

Instructions and Research Study Consent Form Impact of Package Type on Consumer Perception of a Product

The MSU School of Packaging is conducting focus groups that investigate the impact of several different packages on a consumer's perception of a product. Ultimately, this study attempts to:

- 1) Identify consumer perception of package/product systems currently in the market**
- 2) Identify consumer perception of package/product systems that could potentially be used in the market**
- 3) Identify how packaging can impact consumer perception of a product**

To participate you must:

- ☐ Be aged 41-51**
- ☐ Drink Juice**
- ☐ Be willing to travel to Michigan State University's campus for testing**
- ☐ Be willing to be video taped while you participate in the study**

If you decide to participate in this research study, you will be asked to fill out some general demographic information regarding yourself.

You will be presented with six different kinds of packages. You will be asked a series of questions about the packages and invited to freely express your thoughts and feelings. You will also be asked how you perceive the product inside the packages. Additionally you will be asked about your juice drinking habits and your shopping behaviors. This session will last approximately 1-1 ½ hours.

You are free to withdraw from the study at any time for any reason. If you withdraw you will still receive your \$50 cash compensation.

As mentioned, all package testing will be recorded using two video cameras. Video will be used to recall details of the focus group. Video clips may also be used in the classroom for educational purposes. You will not be identified by name in the video clips and you will not be connected to the data collected.

Other than the \$50 cash compensation, you will not benefit directly from your participation in this study. However, your participation in this study may contribute to our understanding of consumer perception of product due to packaging, better inform the industry of consumer perception of packaging, and change the approach to design taken by current and future designers.

Possible risks, although minimal, include the chance that you may become uncomfortable speaking openly in a group. You may also experience anxiety or

embarrassment talking about your consumer behavior. As mentioned previously you will not be identified in the video clips by name. Your privacy will be protected to the maximum extent allowable by law.

If you have any questions or comments regarding this study, please contact Dr. Laura Bix, Director of the School of Packaging at Michigan State University at 517-355-4556 or bixlaura@msu.edu.

If you have any questions or concerns regarding your rights as a study participant, or are dissatisfied at any time with any aspect of this study, you may contact- anonymously, if you wish- Peter Vasilenko, Ph.D., Chair., Chair of the University Committee on Research Involving Human Subjects (UCRIHS) by phone at 517-355-2180, fax 517-432-4503, email at ucrihs@msu.edu or regular mail at 202 Olds Hall, East Lansing, MI 48824.

I voluntarily agree to participate in this study:_____

_____ I consent to using the video clips of myself in the classroom for educational purposes. (You will not be identified by name in the video.)

_____ I DO NOT consent to using the video clips of myself in the classroom for educational purposes. (In this case the video tape will be used only for research purposes to recall details of the session.)

You will be provided with a copy of this consent form.

Consent Form 2

Instructions and Research Study Consent Form Impact of Package Type on Consumer Perception of a Product

The MSU School of Packaging is conducting focus groups that investigate the impact of several different packages on a consumer's perception of a product. Ultimately, this study attempts to:

- 1) Identify consumer perception of package/product systems currently in the market
- 2) Identify consumer perception of package/product systems that could potentially be used in the market
- 3) Identify how packaging can impact consumer perception of a product

To participate you must:

- ☐ Be aged 24-29
- ☐ Drink Juice
- ☐ Be willing to travel to Michigan State University's campus for testing
- ☐ Be willing to be video taped while you participate in the study

If you decide to participate in this research study, you will be asked to fill out some general demographic information regarding yourself.

You will be presented with six different kinds of packages. You will be asked a series of questions about the packages and invited to freely express your thoughts and feelings. You will also be asked how you perceive the product inside the packages. Additionally you will be asked about your juice drinking habits and your shopping behaviors. This session will last approximately 1-1 ½ hours.

You are free to withdraw from the study at any time for any reason. If you withdraw you will still receive your \$50 cash compensation.

As mentioned, all package testing will be recorded using two video cameras. Video will be used to recall details of the focus group. Video clips may also be used in the classroom for educational purposes. You will not be identified by name in the video clips and you will not be connected to the data collected.

Other than the \$50 cash compensation, you will not benefit directly from your participation in this study. However, your participation in this study may contribute to our understanding of consumer perception of product due to packaging, better inform the industry of consumer perception of packaging, and change the approach to design taken by current and future designers.

Possible risks, although minimal, include the chance that you may become uncomfortable speaking openly in a group. You may also experience anxiety or

embarrassment talking about your consumer behavior. As mentioned previously you will not be identified in the video clips by name. Your privacy will be protected to the maximum extent allowable by law.

If you have any questions or comments regarding this study, please contact Dr. Laura Bix, Director of the School of Packaging at Michigan State University at 517-355-4556 or bixlaura@msu.edu.

If you have any questions or concerns regarding your rights as a study participant, or are dissatisfied at any time with any aspect of this study, you may contact- anonymously, if you wish- Peter Vasilenko, Ph.D., Chair., Chair of the University Committee on Research Involving Human Subjects (UCRIHS) by phone at 517-355-2180, fax 517-432-4503, email at ucrihs@msu.edu or regular mail at 202 Olds Hall, East Lansing, MI 48824.

I voluntarily agree to participate in this study:_____

_____ I consent to using the video clips of myself in the classroom for educational purposes. (You will not be identified by name in the video.)

_____ I DO NOT consent to using the video clips of myself in the classroom for educational purposes. (In this case the video tape will be used only for research purposes to recall details of the session.)

You will be provided with a copy of this consent form.

Consent Form 3

Instructions and Research Study Consent Form Impact of Package Type on Consumer Perception of a Product

The MSU School of Packaging is conducting focus groups that investigate the impact of several different packages on a consumer's perception of a product. Ultimately, this study attempts to:

- 1) Identify consumer perception of package/product systems currently in the market**
- 2) Identify consumer perception of package/product systems that could potentially be used in the market**
- 3) Identify how packaging can impact consumer perception of a product**

To participate you must:

- ☐ Be a mother aged 24 years or older with a child between 48-144 months**
- ☐ Drink Juice**
- ☐ Be willing to travel to Michigan State University's campus for testing**
- ☐ Be willing to be video taped while you participate in the study**

If you decide to participate in this research study, you will be asked to fill out some general demographic information regarding yourself.

You will be presented with six different kinds of packages. You will be asked a series of questions about the packages and invited to freely express your thoughts and feelings. You will also be asked how you perceive the product inside the packages. Additionally you will be asked about your juice drinking habits and your shopping behaviors. This session will last approximately 1-1 ½ hours.

You are free to withdraw from the study at any time for any reason. If you withdraw you will still receive your \$50 cash compensation.

As mentioned, all package testing will be recorded using two video cameras. Video will be used to recall details of the focus group. Video clips may also be used in the classroom for educational purposes. You will not be identified by name in the video clips video and you will not be connected to the data collected.

Other than the \$50 cash compensation, you will not benefit directly from your participation in this study. However, your participation in this study may contribute to our understanding of consumer perception of product due to packaging, better inform the industry of consumer perception of packaging, and change the approach to design taken by current and future designers.

Possible risks, although minimal, include the chance that you may become uncomfortable speaking openly in a group. You may also experience anxiety or

embarrassment talking about your consumer behavior. As mentioned previously you will not be identified in the video clips by name. Your privacy will be protected to the maximum extent allowable by law.

If you have any questions or comments regarding this study, please contact Dr. Laura Bix, Director of the School of Packaging at Michigan State University at 517-355-4556 or bixlaura@msu.edu.

If you have any questions or concerns regarding your rights as a study participant, or are dissatisfied at any time with any aspect of this study, you may contact- anonymously, if you wish- Peter Vasilenko, Ph.D., Chair., Chair of the University Committee on Research Involving Human Subjects (UCRIHS) by phone at 517-355-2180, fax 517-432-4503, email at ucrihs@msu.edu or regular mail at 202 Olds Hall, East Lansing, MI 48824.

I voluntarily agree to participate in this study:_____

_____ I consent to using the video clips of myself in the classroom for educational purposes. (You will not be identified by name in the video.)

_____ I DO NOT consent to using the video clips of myself in the classroom for educational purposes. (In this case the video tape will be used only for research purposes to recall details of the session.)

You will be provided with a copy of this consent form.

Appendix D

Demographic Survey and Results

Demographics

About you

Now just a few questions to help us classify your responses:

1) Gender

___ Male ___ Female

2) What is your year of birth?

19___

3) Are you (check as many as apply):

___ Black or African American

___ White

___ Asian (including Chinese, Korean, Japanese, and South East Asians)

___ Native American or Alaskan Native

___ Something else? _____

4) Are you of Spanish, Hispanic or Latino Origin, including Mexican American, Chicano, Mexican, Puerto Rican, Cuban, Central or South American, or Other Hispanic?

___ Yes

___ No

5) What is your family's total household income before taxes?

___ Under \$20,000 ___ \$20,000 to \$34,999 ___ \$35,000 to \$49,999

___ \$50,000 to \$74,999 ___ \$75,000 to \$99,999 ___ \$100,000 or more

6) Excluding Kindergarten, how many years of formal education have you complete?

___ Years

Demographic Results

41-51 year olds

Sex	Birth year	Race	Hispanic	Income	Education
male	1964	White	no	\$50-74,999	Complete Graduate degree
Female	1961	White	no	\$50-74,999	Completed college degree
Female	1958	White	no	\$35-49,999	Completed college degree
Male	1960	Black/Native American	no	under \$20,000	Complete Graduate degree
Male	1957	White	no	\$50-74,999	Complete Graduate degree
Male	1959	White	no	\$35-49,999	Completed college degree
Female	1965	Other	yes	\$75-99,999	Did not complete high School
Female	1959	White	no	\$35-49,999	Complete Graduate degree
Male	1956	White	no	\$75-99,999	Complete Graduate degree
Male	1956	White	no	\$100,000 +	Completed High School
Female	1964	White	no	\$20-34,999	Completed High School
Female	1959	White	no	\$100,000 +	Completed college degree
Male	1958	White	no	\$100,000 +	Completed college degree
Female	1962	White	no	\$100,000 +	Completed college degree
Male	1955	White	no	\$50-74,999	Completed college degree
Female	1963	White	no	\$75-99,999	Completed college degree
Female	1960	White	no	\$20-34,999	Completed college degree
Female	1957	White	no	\$100,000 +	Completed college degree
Male	1957	White	no	under \$20,000	Completed college degree
Female	1962	White	no	\$35-49,999	Completed college degree
Female	1958	White	no	under \$20,000	Completed graduate degree
Female	1958	White	no	\$35-49,999	Completed High School
Male	1956	White	no	under \$20,000	Completed college degree

24-29 year olds

Sex	Birth year	Race	Hispanic	Income	Education
Female	1978	Asian	no	\$20-34,999	Completed college degree
Male	1979	White	no	\$20-34,999	Completed college degree
Male	1981	White	no	\$35-49,999	Did not complete High School
Female	1980	Black	no	under \$20,000	Completed Graduate degree
Male	1981	Asian	no	\$35-49,999	Completed college degree
Male	1983	Asian	no	\$100,000 +	Completed college degree
Female	1982	Asian	no	\$20-34,999	Complete High School
Male	1982	Asian	no	\$100,000 +	Completed college degree
Male	1980	White	no	under \$20,000	Completed college degree
Female	1980	White	no	\$20-34,999	Completed college degree
Male	1983	White	no	under \$20,000	Complete High School
Female	1981	Black	no	under \$20,000	Completed Graduate degree
Female	1982	Black	no	under \$20,000	Complete college degree
Male	1977	White	no	under \$20,000	Completed Graduate degree
		Black/Dominican			
Female	1981	republic	yes	50-74,999K	Completed college degree
Female	1979	Black	yes	\$20-34,999	Completed Graduate degree
Female	1979	White	no	under \$20,000	Other
Female	1977	Asian	no	\$20-34,999	Completed Graduate degree

Mothers with Children

Sex	Birth year	Race	Hispanic	Income	Education
Female	1960	White	no	\$34-35,000	Completed High School
Female	1973	White	no	\$75-99,999	Completed college degree
Female	1972	White	no	\$75-99,999	Completed Graduate degree
Female	1963	White	no	\$75-99,999	Completed college degree
Female	1969	White	no	\$75-99,999	Completed Graduate degree
Female	1950	White	no	\$75-99,999	Completed Graduate degree
Female	1967	White	no	\$75-99,999	Completed Graduate degree
Female	1976	White	no	\$35-49,999	Completed college degree
Female	1976	Black/white	no	Under \$20,000	Completed High School
Female	1966	White	no	\$35-49,999	Completed Graduate degree
Female	1969	Asian	no	\$100,000 +	Completed High School
Female	1965	White	no	\$75-99,999	Completed High School
Female	1974	White	no	\$35-49,999	Completed High School
Female	1965	Asian	no	\$100,000 +	Completed Graduate degree
Female	1973	White	no	\$50-79,999	Completed Graduate degree
Female	1966	Black	no	Under \$20,000	Completed Graduate degree
Female	1969	Black	no	\$75-99,999	Completed Graduate degree
Female	1964	White/other	no	\$100,000 +	Completed Graduate degree

Appendix E

Calculation of Intercoder Reliability

Calculation of intercoder reliabilities

- 1) Approximately 5% of the data was coded by each coder and compared
 - a. 1899 thought units * 0.05% = 94.95, rounded up to 95 thought units.
- 2) Selection taken from 41-51 year olds, 1st focus group

Example of Coding:

Thought Units:

Coder #1: 1 comm-psy-11b 2 cont-psy-2 3 use-func-13A 4 use-psy-14B 5 cont-func-1
 Coder #2: comm-psy-11b use-func-13a lab-func-7a use-psy-14B use-psy-14b

3) Example of Contingency Table

	coder 1	comm-psy-11b	cont-psy-2	use-func-13a	use-psy-14B	lab-func-7a
coder 2						
comm-psy-11b		1				
cont-psy-2			1			
use-func-13a						
use-psy-14B						
lab-func-7a				1	1	

The codes for each of the thought units will be entered in the contingency table. If the two coders agree, a tally will be placed in the diagonal cells. For example, the first thought unit, both coders agreed it was a Communication-Psychosocial unit. Thus a tally will be placed in the upper left diagonal cell. Disagreements were placed in the off diagonal cells. For the second thought unit, coder #1 thought the unit was a containment-psychological unit, while coder #2 thought it was a use-function unit. Thus, a tally was placed in a cell off the diagonals.

- 4) The sum of the results were totaled in each cell. Next, the row and column totals of the observed frequencies were summed. (Note: this is an EXAMPLE of the data calculated, NOT the total table)

	coder 1	comm-psy- 11b	cont-psy- 2	use-func-13a	use-psy-14B	lab-func-7a	Row Totals
coder 2							
comm-psy-11b		11					11
cont-psy-2							0
use-func-13a			1	11			12
use-psy-14B					2		2
lab-func-7a				1	1		2
Column Total	11	11	1	12	3	0	27

- 5) Compute the total number of agreements by totaling the values in the diagonal cells of the table. For the EXAMPLE the numbers sum:

$$\Sigma a = 11 + 11 + 2 = 27$$

In the case for **THIS EXPERIMENT**, the diagonals summed:

$$\sum a = 3 + 2 + 4 + 1 + 9 + 4 + 11 + 15 + 11 + 2 + 1 + 3 + 1 + 3 + 1 + 1 = 72$$

- 6) Compute the expected frequency for the number of agreements by chance. For the **EXAMPLE**, the numbers sum:

$$E_f = \frac{\text{row total} * \text{column total}}{\text{Overall total}} = \frac{11 * 11}{27} = 4.48$$

For **THIS EXPERIMENT** the numbers sum:

$$E_f = \frac{\text{row total} * \text{column total}}{\text{Overall total}} = \frac{7 * 7}{95} = 0.515$$

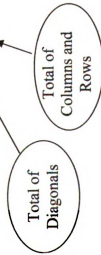
*Note = 95 comes from the total of columns and rows for **THIS EXPERIMENT**

- 7) Compute the sum of the expected frequencies of agreement by chance. In this experiment the numbers are as follows:

$$\sum E_f = 0.515 + 0.094 + 0.263 + 0.031 + 1.052 + 0.252 + 1.894 + 2.842 + 1.894 + 0.094 + 0.0211 + 0.168 + 0.021 + 0.042 + 0.095 + 0.011 + 0.011 = \underline{\underline{9.305}}$$

- 8) Compute Kappa

$$K = \frac{\sum a - \sum E_f}{N - \sum E_f} = \frac{(72 - 9.305)}{(95 - 9.305)} = 0.732 \text{ (Kappa that is } > 0.70 \text{ is deemed satisfactory)}$$



Appendix F

Focus Group Findings

Comments from Focus Groups According to Function

Function	Containment	Glass	Flexible Pouch	Gable Top Carton	Brick Pack	HDPE Bottle	Aluminum Bottle	PET Bottle
Supportive Comments	Good for almost all situations					Durable Won't leak		Durable Won't leak
Unsupportive comments	Breakable		Easily pierced Will leak	Not Durable Breaks Easily Could leak	Easily pierced			
41-51 year olds							Sturdy	
24-29 year olds	No profound comments made							
Mothers with Children	No profound comments made							

Function	Protection	Glass	Flexible Pouch	Gable Top Carton	Brick Pack	HDPE Bottle	Aluminum Bottle	PET Bottle
Supportive Comments	Ideal, pure, clean, Will not interact with product			Reclosable spout keeps product fresher longer				

Comments Continued

Unsupportive Comments		Product gets squished	Waxy, papery taste	Paper like taste	Transfers to product	-Abrupt temperature changes	Transfers to product
41-51 Year olds	No profound comments made						
24-29 Year olds	No profound comments made						
Mothers with Children			Will break easily		-Leaching into the product		

Function	Communication						
Transparency, Shape, & other features	Glass	Flexible Pouch	Gable Top Carton	Brick Pack	HDPE Bottle	Aluminum Bottle	PET Bottle
Supportive Comments	-Great to see the product -Healthy -Natural -Quality		Typical juice package		Nostalgia	New and interesting	Great to see the product -aesthetically pleasing design

Comments Continued

Unsupportive Comments	-Expensive	Space age Unhealthy Medical looking	Kids, sugar water	Bad experience with milk	Not transparent Looks like cleaning products
41-51 year olds	No profound comments made				
24-29 year olds			-The juice package, -Something healthy comes inside		
Mothers with Children			The juice package		Kids would like the shininess and its cool

Labeling of juice in general

Supportive	Natural, simple, clearly stated facts Organic Natural colors
Unsupportive	No crazy colors and graphics
41-51 year olds	No profound comments
24-29 year olds	Fun healthy facts
Mothers with Children	Fun health facts

Comments Continued

Labeling for cherry juice

Positive	Words like, "Antioxidant, heart healthy" Clearly stated in large letters, easy to read A heart graphic Credible source backing up claims
Negative	No gimmicks No childish labels
24-29 year olds	Fun healthy facts
Mothers with Children	Fun health facts

Function						
Utility	Easy to use, handle, carry, dispense, open, reclose					
Use of the Product	Glass	Flexible Pouch	Gable Top Carton	Brick Pack	HDPE Bottle	Aluminum Bottle
Supportive Comments			Fit nicely in the fridge, easy to pour		lightweight	lightweight
Unsupportive Comments			Difficult to open, spillable, inconvenient, not on the go	Difficult to open Lost straw Messy Squirted all over	Slippery	slippery
						Easy to hold, compact, lightweight

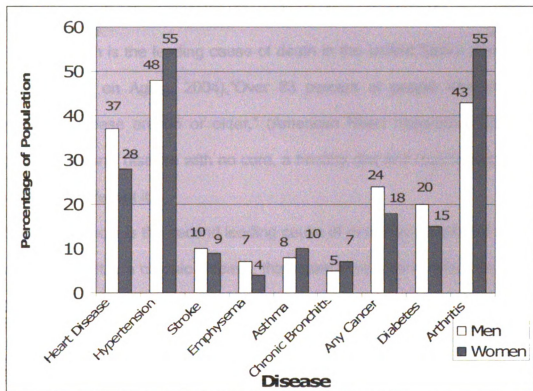
Comments Continued

Unsupportive Comments		Not recycleable	Not recycleable	Not recycleable			
41-51 year olds			Made from renewable energy				
24-29 year olds						Danger of storing things in aluminum	
Mothers with Children			-Will break easily -Made from renewable energy				

Appendix G

Diseases associate with aging

Much of the literature published on the healthful and beneficial properties of cherry juice, suggest it can be medicinal for diseases like arthritis, heart disease, and cancer. These diseases are among the top five that ail Americans Aged 65 years and older according to the Center for Disease Control and Prevention (CDC) (CDC 2004).



(CDC 2004)

Due to the healthful benefits and properties of cherry juice, it is thought that consumption may help relieve some of the pain of these disease or even help to prevent them from occurring. Although arthritis can and does effect people of all ages, the CDC reported that 49.9% of all men and women who are aged 65 years of age or older in the United States reported suffering from some form of arthritis. The age of onset for several forms of arthritis are middle age or above. Typically, with all diseases, prevalence increases with age. The same is true for heart disease, which is the leading cause of death in the United States (Federal Interagency Forum on Aging, 2004), "Over 83 percent of people who die of coronary heart disease are 65 or older," (American Heart Association 2006). Although it is a chronic disease with no cure, a healthy diet and regular exercise are some ways to prevent it,

Similarly, cancer is the second leading cause of death for Americans aged 65 years and older It is a chronic disease, that again increases in occurrence as ages increase. Currently there is no known cure for cancer, but several treatments exist that may help to alleviate the pain and discomfort of the disease.

Several studies (previously discussed in the literature review) have shown consumption of cherry juice to alleviate some of the symptoms of these diseases and even aid in reducing the risk of them occurring. Because of these results, it was thought that a larger population of people aged 65 years and older, were the main consumers of cherry juice. The aim of this study was to expand the focus of the cherry industry into other markets, suggesting cherry juice is not just for a specific population with diseases, but for everyone.

Appendix H

Recruitment Examples

DO YOU DRINK JUICE?

Who: Anyone aged 41-51 who drinks juice

What: We want YOUR input on beverage packages. The MSU School of is conducting a research study to consumers perceive different beverage packages. Study subjects will be asked to participate in a one time focus group session and asked to express their thoughts and feelings about several different kinds of beverage packaging.

Where: The focus group will take place in Michigan State University's Communication Arts and Sciences building in room 182. This is located on Michigan State University's campus on the corner of Wilson and Red Cedar road, East Lansing, MI 48823.

Why: The intent of this study is to collect information about consumer perceptions of packaging. For your participation you will receive \$50.

How:

If you are interested in participating in this study, please contact Audrey Whaling at whalinga@msu.edu or via phone at 517-282-1198

Recruitment Flyer 2

DO YOU DRINK JUICE?

Who: Anyone aged 24-29 who drinks juice

What: We want YOUR input on beverage packages. The MSU School of is conducting a research study to consumers perceive different beverage packages. Study subjects will be asked to participate in a one time focus group session and asked to express their thoughts and feelings about several different kinds of beverage packaging.

Where: The focus group will take place in Michigan State University's Communication Arts and Sciences building in room 182. This is located on Michigan State University's campus on the corner of Wilson and Red Cedar road, East Lansing, MI 48823.

Why: The intent of this study is to collect information about consumer perceptions of packaging. For your participation you will receive \$50.

How:

If you are interested in participating in this study, please contact Audrey Whaling at whalinga@msu.edu or via phone at 517-282-1198

Recruitment Flyer 3

DO YOU DRINK JUICE?

Who: Mothers 24 years or older with children between the ages of 4 and 12 years, who drink juice

What: We want YOUR input on beverage packages. The MSU School of is conducting a research study to consumers perceive different beverage packages. Study subjects will be asked to participate in a one time focus group session and asked to express their thoughts and feelings about several different kinds of beverage packaging.

Where: The focus group will take place in Michigan State University's Communication Arts and Sciences building in room 182. This is located on Michigan State University's campus on the corner of Wilson and Red Cedar road, East Lansing, MI 48823.

Why: The intent of this study is to collect information about consumer perceptions of packaging. For your participation you will receive \$50.

How:

If you are interested in participating in this study, please contact Audrey Whaling at whalinga@msu.edu or via phone at 517-282-1198

Recruitment Email 1

For: Anyone between the ages of 41-51 who drink juice

Subject: MSU research project participation

Greetings! Do you drink juice? Would you like to participate in a research project for the School of Packaging at Michigan State University? This email is intended to inform you about an opportunity occurring at MSU. Please note that you are under no obligation to participate.

Purpose: The MSU School of packaging wants YOUR input on beverage packages. The study is designed to find out how consumers perceive different beverage packages. Six packaging types will be presented through a focus group session and participants will be asked to express their thoughts and feelings about the packages. The intent of this study is to collect information about consumer perceptions of packaging.

Study Information:

If you would like to participate in this study, you will be asked to participate in one meeting, lasting about 1 ½ hours. This meeting will consist of discussions about different beverage packages. These meetings will occur Tuesday, February 13th and Thursday February 15th from 6:00-7:30 PM. You will only need to attend one session.

Compensation:

For your participation you will receive \$50. If you do participate, and during the course of the study decide to withdraw from the study, you may do so without penalty.

Location:

The focus group will take place in Michigan State University's Communication Arts and Sciences building in room 182. This is located on Michigan State University's campus on the corner of Wilson and Red Cedar road, East Lansing, MI 48823.

Requirements:

To participate in this focus group, you must be of or between the ages of 41 and 51.

Contact Information:

If you are interested in participating in this study, please contact Audrey Whaling at whalinga@msu.edu or via phone at 517-282-1198.

If you have questions or concerns about this study, please contact Dr. Laura Bix at bixlaura@msu.edu or via phone at 517-355-4556

Recruitment Email 2

For: Anyone between the ages of 24-29 who drink juice

Subject: MSU research project participation

Greetings! Do you drink juice? Would you like to participate in a research project for the School of Packaging at Michigan State University? This email is intended to inform you about an opportunity occurring at MSU. Please note that you are under no obligation to participate.

Purpose: The MSU School of packaging wants YOUR input on beverage packages. The study is designed to find out how consumers perceive different beverage packages. Six packaging types will be presented through a focus group session and participants will be asked to express their thoughts and feelings about the packages. The intent of this study is to collect information about consumer perceptions of packaging.

Study Information:

If you would like to participate in this study, you will be asked to participate in one meeting, lasting about 1 ½ hours. This meeting will consist of discussions about different beverage packages.

Compensation:

For your participation you will receive \$50. If you do participate, and during the course of the study decide to withdraw from the study, you may do so without penalty.

Location:

The focus group will take place in Michigan State University's Communication Arts and Sciences building in room 182. This is located on Michigan State University's campus on the corner of Wilson and Red Cedar road, East Lansing, MI 48823.

Requirements:

To participate in this focus group, you must be of or between the ages of 24 and 29. You must also drink juice.

Contact Information:

If you are interested in participating in this study, please contact Audrey Whaling at whalinga@msu.edu or via phone at 517-282-1198.

If you have questions or concerns about this study, please contact Dr. Laura Bix at bixlaura@msu.edu or via phone at 517-355-4556

Recruitment Email 3

For: Mothers 24 years or older with children between 4-12 years of age

Subject: MSU research project participation

Greetings! Do you drink juice? Would you like to participate in a research project for the School of Packaging at Michigan State University? This email is intended to inform you about an opportunity occurring at MSU. Please note that you are under no obligation to participate.

Purpose: The MSU School of packaging wants YOUR input on beverage packages. The study is designed to find out how consumers perceive different beverage packages. Six packaging types will be presented through a focus group session and participants will be asked to express their thoughts and feelings about the packages. The intent of this study is to collect information about consumer perceptions of packaging.

Study Information:

If you would like to participate in this study, you will be asked to participate in one meeting, lasting about 1 ½ hours. This meeting will consist of discussions about different beverage packages.

Compensation:

For your participation you will receive \$50. If you do participate, and during the course of the study decide to withdraw from the study, you may do so without penalty.

Location:

The focus group will take place in Michigan State University's Communication Arts and Sciences building in room 182. This is located on Michigan State University's campus on the corner of Wilson and Red Cedar road, East Lansing, MI 48823.

Requirements:

To participate in this focus group, you must be a mother of or above the age of 24 with a child of or between the ages 4-12 years of age. You must also drink juice.

Contact Information:

If you are interested in participating in this study, please contact Audrey Whaling at whalinga@msu.edu or via phone at 517-282-1198.

If you have questions or concerns about this study, please contact Dr. Laura Bix at bixlaura@msu.edu or via phone at 517-355-4556

Web advertisement

Would you like to make some \$\$? Do you drink juice? Looking for adults aged 24-29, 41-51 and 24+ mothers with children to participate in a focus group. This one time session will last 1-1 ½ hours and will focus on consumer perception of packaging. For further info, contact packaginggroup06@gmail.com.

References

- Abbott, D., (1989), Packaging Perspectives, Kendall/Hunt Publishing Company, Dubuque, Iowa
- Allen, P., (2004), "Welcoming Y!" *Benefits Canada*, 28(9), 51-53.
- Ampuero, O., & Vila, N., (2006), "Consumer perceptions of product packaging," *Journal of Consumer Marketing*, 23(2), 100-112.
- Anderson, J., (1985), Cognitive Psychology and Its Implications, W.H. Freeman, San Francisco, California.
- Beverland, M., (2006) "The 'real thing': Branding authenticity in the luxury wine trade," *Journal of Business Research*, 59, 251-258.
- Bruice, P. (2001) Organic Chemistry, 3rd edition. Prentice Hall, Upper Saddle River, New Jersey, 347.
- Blau, L. (1950), "Cherry diet control for gout and arthritis," *Texas Reports on Biology and Medicine*, 309-311.
- Cherry Market Institute (2003) Michigan Cherry Committee, *Background*, 2003, Accessed April 20th, 2006:
http://www.cherrymkt.org/media/background_info.html
- Cherry Marketing Institute, (2006), CMI Juice Brochure 2, Accessed April 29th, 2006,
http://www.cherrymkt.org/downloads/CMI_JuiceBro2.pdf
- Cherry Market Institute (2003), *Cherry Advantage*, Michigan Cherry Committee, 7
- Cherry Market Institute; Michigan Cherry Committee, (2003), *Tart Cherries crop statistics and Market Analysis*, Michigan Cherry Committee Presentation
- Centers for Disease Control and Prevention. (2004). "The State of Aging and Health in America, 2004."
- Cichon, A. & Ucherek, M., (1999), "The Influence of packagings of fruit juices on consumers' preferences," *Vorum, Ware*, 1(4), 58-64
- USDA (2004), Code of Federal Regulations, Title 21, Section 101, Retrieved June 1st, 2007,
<http://www.cfsan.fda.gov/~lrd/cf101-14.html>

DeFelice, Stephen L. *FIM's 10th Nutraceutical Conference: FIM Rationale and proposed guidelines for the nutraceutical research & education act-NREA*. Presented November 10-11, 2002. The Waldorf-Astoria, New York City

DNS Retailing Today, (2002), "Easy-open paint - What's Hot - Sherwin-Williams' Dutch Boy's packaging innovation plastic gallon container with an easy twist-off lid, comfort side handle and pouring spout," Find-Articles.com, Accessed May 15, 2007, http://findarticles.com/p/articles/mi_m0FNP/is_15_41/ai_90529517

Engle, J., Blackwell, R. & Miniard, P., (1995), *Consumer behavior*, 8th edition, Dryden Press, Hinsdale, IL.

Federal Interagency Forum on Aging, (2004), "*Key indicators of Well being*," Older Americans, Update 2004, Federal Interagency Forum on Age-Related Statistics

Fennel, G., (1978), "Consumers' Perception of the Product. Use Situation." *Journal of Marketing*, 42(2), 38-27.

Fresh & Co. Subotica. Next Juice. 2002
Accessed July 20, 2006:
<http://www.nextjuice.com/ehome.htm>

Fox, K., (2005) "Packaging Research: An Overview," *Applied Ergonomics*, (36), 363-372.

Fleischman, A. (1966), "The package as a marketing lever," Management Bulletin, 85. Packaging Division, American Management Association.

Fuhrman, B., Volkova, N., & Aviram, M., (2005), "Pomegranate Juice inhibits oxidized LDL uptake and cholesterol biosynthesis in macrophages," *Journal of Nutritional Biochemistry*, 16, 570-576.

Getachew, A., & Peterson, C. (2005), *Rapid opportunity assessment: Fruit sector*. MSU Product Center for Agriculture and Natural Resources. MI. USA.

George, J., (2006), "Survey: Perception huge in beverage packaging," *Packaging World Magazine*, October, 98.

Giovanni P., (2005), "Determinants of Knowledge Flows and Their Effect on Innovation," *The Review of Economics and Statistics*, MIT Press, 87(2), 308-322.

Global Marketing Database (2006) "Beverage Packaging Annual Report 2005, United States," Global Marketing Database

Gonzales, M., (2006), "Shelf-life of tart cherry nutraceutical juice: A comparison." of flexible pouches to bottles made from glass, PET, and aluminum, " Research Proposal.

Greensberg, E., (2005) "Legal Impact : Claims, not chemistry, often make for product problems," *Packaging Digest*, Retrieved May 13th, 2007:
<http://www.packagingdigest.com/articles/200512/20.php>

Gutman, J., (1997), "Means-End Chain as Goal Hierarchies," *Psychology & Marketing*, 14(6), 545-560

Halvorsen B, Carlsen M, Phillips K, Bohn S, Holte K, Jacobs D., & Blomhoff R., (2006), "Content of redox-active compounds (i.e. antioxidants) in foods consumed in the United States. American," *Journal of Clinical Nutrition*, (84), 95-135.

Hobbs, J. E., (2002) "Evolving Supply Chains in the Nutraceuticals and Functional Foods Industry," *Canadian Journal of Agriculture Economics*, 50,(4), 559-568.

Jacoby, J & Olson, J., (1984), Perceived Quality: How Consumers View Stores and Merchandise. D.C. Heath and Company. Massachusettes.

Jensen, T., (1997) "Tatham Chugs a \$12 mil. campaign for Dean Foods" *Adweek*, 38 (45), 2.

Johnson, L., (1990) "Quality: how to meet customer demands in a process from design to disposal," *Journal of Occupational Accidents*, (13), 167-170.

Karnes, C., Sridharan, S., & Kanet, J., (1995) "Measuring quality from the consumer's perspective: A methodology and its application," *Production Economics*, 39, 215-225.

Kupiec, B, & Revell, B. (2001), "Measuring consumer quality judgments," *British Food Journal*, 103(1), 7-22.

Kim, D., Heo, H., Kim, Y., Yang, H., & Lee, C., (2005), "Sweet and Sour Cherry Phenolics and their protective effects on neuronal cells," *Journal of Agriculture and Food Chemistry*, 53, 9921-9927.

Lansky, E. & Newman, R., (2007), "*Punica granatum* (pomegranate) and its potential for prevention and treatment of inflammation and cancer," *Journal of Ethnopharmacology*, (109), 177-206.

Lukas, P., (2005) "Heavy Metal", *Fast Company*, 99, 38.

Kang, S., Seeram, N., Nair, M., & Bourquin, L., (2003), "Tart cherry anthocyanins inhibit tumor development in Apc (Min) mice and reduce proliferation of human colon cancer cells.," *Biotech Week*, June, 186.

Markgraf, S. (1998), "Dean Foods Co." *Dairy Foods*, 99(4), 72.

Nasalroad, D., (1992), A study of the communication effects of food packaging health claims on consumer perceptions. Doctoral Dissertation, University of Oklahoma.

Olson, J. & Jacoby, J., (1972), "Cue utilization in the quality perception process," *Proceedings of the Third Annual Conference*, 167-179. Association for Consumer Research, Ann Arbor, MI.

Olson, J., & Reynolds, T., (2001) "Understanding consumer decision making," Understanding consumer decision making The means-end approach to marketing and Advertising Strategy. Lawrence Erlbaum Associates. Mahwah, New Jersey.

Peters, M., (1994), "Good packaging gets through to fickle buyers," *Marketing* 20 (8).

Peters-Teixeira, A. & Badrie, N., (2005), "Consumers' perceptions of food packaging in Trinidad, West Indies and its related impact on food choices," *International Journal of Consumer Studies*. 29(6), 508-514.

Patuck, A., Leppert, J., Zomorodian, N., Aronson, W., Hong, J., Barnard, R.J., Seeram, N., Liker, H., Wang, H., Elashoff, R., Herber, D., Aviram, M., Ignarro, L., & Beldegrun, A., (2006), "Phase II Study of Pomegranate Juice for Men with Rising Prostate-Specific Antigen following Surgery or Radiation for Prostate Cancer," *Clinical Cancer Research*, 12(13), 4018-4026.

Prasad, K, Cole. W, Kumar, B., ChePrasad, K., (2002) "Pros and cons of antioxidant use during radiation therapy," *Cancer Treatment Reviews*, (2), 79-91.

Pullman, M., Moore, W, and Wardell, D. (2002), "A comparison of quality function deployment and conjoint analysis in new product design," *The Journal of Product Innovation Management*, (19), 354-364.

Raudenbush, R. Meyer, B., Eppich, W., Corley, N., & Petterson, S., (2002), "Ratings of pleasantness and intensity for beverages served in containers congruent and incongruent with expectancy," *Perceptual Motor Skills*, 94, 671-674.

Riesman, D. & Rosenborough, H., (1955), "Careers and Consumer Behavior," *Consumer Behavior*, ed. L. H. Clark, New York: New York, University Press, 1-20.

Robertsons, Food Packaging: Principles and Practice
<http://books.google.com/books?hl=en&lr=&id=NFRR6GayR74C&oi=fnd&pg=PA1&dq=four+functions+of+packaging&ots=OkvYgoXSIU&sig=KqLEQ9VyvcljHBG5oCaeSgRlcFI>

Saint Gobain Container (2002), "Stock Containers, 12.75 FL Oz bottle description," Saint Gobain Website, Accessed April 14th, 2007:
<http://www.sgcontainers.com/bf/stckweb.nsf/ac4ce8cbd1638d6105256d41005e4ef8/629052b6574aaa2d05256b89005b87c4?OpenDocument&Highlight=0,4356012B>

Schewe, C., & Meredith, G., (2004) "Segmenting global markets by generational cohorts: Determining motivations by age", *Journal of Consumer Behavior*, 4(1), 51.

Schewe, C., Meredith, G., & Noble, S. (2000), "Defining moments: Segmenting by cohort," *Marketing Management*, 9(3), 48.

Schnabel, M., (1976), "Defining a product," *The Journal of Business*, 49 (4), 517.

Seeram, N., & Heber, R., (2004), "Bioavailability of ellagic acid in human plasma after consumption of ellagitannins from pomegranate (*Punica granatum* L.) juice," *Clinica Chimica Acta*. 63-68.

Silayoi P. & Speece, M., (2004), "Packaging and Purchase Decisions," *British Food Journal*. 106 (8/9) 607.

Stokes, R., (1984), "The Effect of Price, Package Design, and Brand Familiarity on Perceived Quality," *Perceived Quality: How Consumers View Stores and Merchandise*. D.C. Heath and Company. Massachusetts.

Thompson, S., (1998), "Chug-a-mania," *Brandweek*, 39(25) 22.

Thornsbury, S., & Woods, M. (2005), "Market Study of the Polish Tart Cherry Industry," Final Report, Department of Agricultural Economics, Michigan State University, Accessed July 30th, 2007:
http://www.globalhort.msu.edu/docs/FinalReport_website.pdf

Tinney, M., (2005), "3L Boxed Wine Sales Take Off," *Retail Sales Analysis*, 12(8).

Twede, D. & Selke, S., (2005), Cartons, Crates and Corrugated Board: Handbook of Paper and Wood Packaging Technology. Lancaster, PA: DesTech Publications.

USDA, NASS., (2005) Michigan Agriculture Statistics 2004-2005. Michigan department of Agriculture 2004 Annual Report.

U.S. Census Bureau (2006), "Educational Attainment," U.S. Census of 2006, Accessed July 30th, 2006:
<http://www.census.gov/Press-Release/www/releases/archives/education/009749.html>

Van Dam, Y., and Van Trijp, Y., (1993), "Consumer perceptions of and preferences for product packaging," *Proceedings of the Annual Conference-European Marketing Academy*.

Wang, H., Nair, M., Strasburg, G., Chang, Y., Booren, A., Gray, J., & DeWitt, D., (1999), "Antioxidant and Antinflammatory Activities of Anthocyanins and Their Aglycon, Cyanidin, from Tart Cherries," *Journal of Natural Products*, 62(2) 294-296.

Wyer, Robert S., Jr., and Thomas K. Srull (1989), Memory and Cognition in Its Social Context, Hillsdale, NJ: Erlbanm.

Zeithaml, V. (1985) "The New Demographics and Market Fragmentation," *Journal of Marketing*, 49,, 64-75.

Zeithaml, V., (1988), "Consumer Perceptions of Price, Quality, and Value: A Means-End Model and Synthesis of Evidence," *Journal of Marketing* 52 (3), 2.

MICHIGAN STATE UNIVERSITY LIBRARIES



3 1293 02956 2240