

THE DIET CULTURE PHENOMENON AND ITS EFFECT ON THE UNITED
STATES ORANGE JUICE INDUSTRY

By

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by

Leigh Ann Love

This document is dedicated to God, to my friends, and to my family. It is especially dedicated to Sarah Austin (the best friend every woman should have), Jessica Musengezi (who had patiently listened to my excitement and exasperations) and to my nephew Cameron Maximilian Love (may his hopes and dreams be even bigger than his name).

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TABLE OF CONTENTS

	<u>page</u>
ACKNOWLEDGMENTS	iv
LIST OF TABLES	viii
LIST OF FIGURES	x
ABSTRACT.....	xi
CHAPTERS	
1 INTRODUCTION, PROBLEM STATEMENT, AND OBJECTIVES	1
Introduction.....	1
Problem Statement.....	2
Researchable Question.....	3
Hypotheses.....	3
Objectives	3
A Brief Overview of What Follows.....	4
2 LITERATURE REVIEW	6
Diets and Dieting in America	6
Diet Culture	6
Demographics of Dieters.....	7
Low-Carbohydrate Diets	8
<i>Dr. Atkins' New Diet Revolution</i>	9
<i>Dr. Agatston and The South Beach Diet</i>	10
Application of Diet Literature	11
United States Orange Juice Industry.....	11
The Golden Fruit	11
Florida Department of Citrus.....	13
Recent Orange Juice Consumption Trends	13
Industry Snapshot.....	14
Regional Consumption	14
Consumer Profile.....	15
Dieting and Orange Juice Consumption.....	15
Application of Industry Literature.....	16
Health Information Sources.....	16
Content Analysis.....	19
Relation to Scientific Method.....	20
Typical Process.....	20
Application of Method	21
Concerns to be Addressed	25
Application of Content Analysis Literature	25

Book Popularity	26
Life Cycle Theory	27
Applications and Modifications	28
Application of Life Cycle Theory Literature.....	30
3 DATA COLLECTION AND ANALYSIS.....	32
National and Regional Media Data Collection.....	32
Electronic Databases	32
Sampling.....	33
Data Collection.....	33
Coding	34
Time Periods Considered	34
National Newspaper Analysis	35
National Magazine Analysis.....	37
Regional Newspaper Analysis.....	38
Book Popularity as Ranked on National Bestseller Lists.....	40
<i>Publishers Weekly</i> Bestseller Lists.....	41
Additional Data Collection.....	42
Purchases (Variable: PCGal).....	42
Price (Variable: RP)	44
Gross Rating Point (Variable: GRP)	45
Field Staff (Variable: FieldStaff).....	45
Personal Disposable Income (Variable PCINC)	46
4 LIFE CYCLE HYPOTHESIS	47
Product Life Cycle Theory	47
Source of Diet Information: Newspapers and Magazines	49
Source of Diet Information: Diet Books.....	54
Conclusions.....	60
5 DIET MEDIA COVERAGE AND PURCHASES HYPOTHESIS	61
Trends in Diet Media Coverage and Per Capita Purchases of Orange Juice.....	61
U.S. Diet Media Coverage and Orange Juice Purchases.....	61
Southern Region Diet Media Coverage and Orange Juice Purchases	63
The Base Model, U.S. Orange Juice Demand	64
The Adjusted Base Model, U.S. Orange Juice Demand.....	67
Empirical Results, U.S. Orange Juice Demand.....	68
Autocorrelation.....	70
Elasticity at the Means for U.S. Orange Juice Demand	70
U.S. Correlation Analysis.....	71
Southern Region Orange Juice Demand Model	73
Empirical Results, Southern Region Orange Juice Demand.....	75
Autocorrelation.....	78
Elasticity at the Means for Southern Region Orange Juice Demand	78

	Southern Region Correlation Analysis	79
	Conclusions.....	80
6	SUMMARY, IMPLICATIONS, AND FUTURE RESEARCH	82
	Summary of Data Collection	83
	Major Findings.....	83
	Hypothesis 1	83
	Hypothesis 2	86
	Research Implications.....	87
	Suggestions for Future Research	90
	Alternative Information Sources	91
	Media Impact and Demand	92
	Information Access and Application by Consumers	92
APPENDIX		
A	DIET MEDIA COVERAGE DATA TABLES	93
B	NATIONAL AND REGIONAL PURCHASE AND PRICE DATA TABLES	113
C	SAS PROGRAM USED TO ESTIMATE DEMAND	127
	BIOGRAPHICAL SKETCH	134

LIST OF TABLES

<u>Table</u>	<u>page</u>
3.1: Newspaper Circulation, Greater than 1 Million Copies Sold.....	35
3.2: Summary of National Newspaper Data Collection.....	37
3.3: Magazine Circulation, Highest Paid Circulation Within Category.....	37
3.4: Summary of National Magazine Data Collection.....	38
3.5: Southern Region Newspaper Circulation.....	39
3.6: Summary of Regional Newspaper Data Collection, January 1997 through December 2004.....	40
5.1: Estimated Model Results of U.S. Per Capita Orange Juice Demand.....	68
5.2: Elasticity at the Mean for Price, Income, and Diet Media Coverage in the Model for U.S. Orange Juice Demand.....	71
5.3: Correlation Coefficient Matrix for National Orange Juice Demand Model, significance of each correlation also shown.....	72
5.4: Estimated Model Results of Southern Region Per Capita Orange Juice Demand...76	76
5.5: Elasticity at the Mean for Price, Income, and Diet Media Coverage in the Model for Southern Region Orange Juice Demand.....	78
5.6: Correlation Coefficient Matrix for Southern Region Orange Juice Demand Model, significance of each correlation also shown.....	79
A.1: National Diet Media Coverage Collected from National Newspapers and Magazines, October 1995 through January 2005.....	93
A.2: Southern Region Health Information as Collected from Regional Newspapers, January 1997 through January 2005.....	97
A.3: Weekly Bestseller Rankings for <i>Atkins' New Diet Revolution</i> by Dr. Robert Atkins, New York Times and Publisher Weekly Bestseller Lists, April 1996 through February 2004. (Weeks that the book was not ranked are indicated as NR)	100
A.4: Weekly Bestseller Rankings for <i>The South Beach Diet</i> by Dr. Arthur Agatston, New York Times and Publisher Weekly Bestseller Lists, April 27, 2003 through December 19, 2004. (Weeks that the book was not ranked are indicated as NR) .110	110
B.1: National Data Summary Table, October 1995 through January 2005.....	113

B.2: Southern Region Data Summary Table, January 1997 through January 2005.	117
B.3: Weighted Average Price (National), based upon Prices and Quantity for various Product Forms	120
B.4: Weighted Average Price (Regional), based upon Prices and Quantity for various Product Forms	124

LIST OF FIGURES

<u>Figure</u>	<u>page</u>
4.1: Total Media Articles (January 1995 through December 2004).....	50
4.2: National Newspaper Articles (October 1995 through December 2004).....	51
4.3: National Magazine Articles (October 1995 through December 2004)	51
4.4: Regional Newspaper Articles (January 1995 through December 2004).....	53
4.5: <i>Atkins' New Diet Revolution</i> Weekly Rankings, <i>Publishers Weekly</i> Bestseller List (April 28, 1996 through December 28, 2003).....	56
4.6: <i>Atkins' New Diet Revolution</i> Weekly Rankings, <i>New York Times</i> (April 28, 1996 through December 28, 2003).....	57
4.7: <i>The South Beach Diet</i> Weekly Rankings, <i>Publishers Weekly</i> (April 27, 2003 through December 12, 2004).....	58
4.8: <i>The South Beach Diet</i> weekly rankings, <i>New York Times</i> (April 27, 2003 through December 19, 2004)	59
5.1: U.S. Per Capita Orange Juice Purchases and Newspaper Articles on Low- Carbohydrate Diets and Dieting, Annual (1996 through 2004)	62
5.2: U.S. Per Capita Orange Juice Purchases and Magazine Articles on Low- Carbohydrate Diets and Dieting, Annual (1996 through 2004)	63
5.3: Southern Region Orange Juice Purchases and Newspaper Articles, Annual (1997 through 2004).	64
5.4: U.S. and Southern Region Per Capita Purchases of Orange Juice, Annual (1996 through 2004)	74

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Generally speaking, fruit and fruit juices have been accepted by the public and nutritionists as excellent nutrient sources and important additions to a healthy diet. Culturally, juice and orange juice in particular have a direct association with breakfast meals. In the United States, these preferences have come under attack by low-carbohydrate diet proponents and adherents.

In 1972 and 1992, Dr. Robert Atkins published a book detailing the benefits and guidelines for a low-carbohydrate lifestyle. The bestseller status of this book since 1996 has prompted public and media attention towards low-carbohydrate lifestyles developed by Dr. Atkins and other doctors, such as Dr. Arthur Agatston who published a book about low-carbohydrate dieting entitled *The South Beach Diet*. These diets, in many cases, specifically encourage diet adherents to decrease or completely eliminate consumption of fresh fruit and/or fruit juices while dieting.

The major objective of this study was to determine if a relationship exists between diet media coverage of low-carbohydrate diets and dieting and consumer demand for orange juice. Using per capita purchase data as a proxy for consumer demand of orange juice, two demand models, representing demand for orange juice in the United States and demand for orange juice in the Southern region, are presented to explain decreases in demand for orange juice. Conclusions about the effect of diet media coverage in newspapers upon demand for orange juice are based on estimates of per capita purchases as related to changes in factors such as price, diet coverage, existence of field staff, per capita discretionary income, and previous period purchases. The results indicate that diet media coverage does have a negative and significant effect upon purchases of orange juice in both the United States and within the Southern region.

An additional objective of the study was to determine whether or not diets occur in cycles and if said diet life cycles are defined by the amount of diet media coverage and diet book popularity. Articles about low-carbohydrate diets and dieting were collected from highly-circulated newspapers and magazines and weekly bestseller rankings of popular diet books were collected as reported by *Publisher's Weekly*.

Orange juice is a major agricultural commodity produced in Florida. In 2002, citrus groves represented 8.37 percent of Florida total farm acreage and accounted for 21 percent of Florida farm sales; 95 percent of the Florida orange crop is processed into orange juice. This study contributes an awareness of the impact that dieting trends, particularly the low-carbohydrate diet, has upon consumption and purchases of food products, specifically orange juice.

CHAPTER 1 INTRODUCTION, PROBLEM STATEMENT, AND OBJECTIVES

Diets have come and gone, but the passion for slimming has mounted steadily. Weight watching and dieting have become a part of the customary fabric of American society, from the nightclub to the nursery. Hillel Schwartz, *Never Satisfied*

Introduction

Generally speaking, fruit and fruit juices have been accepted by the public and nutritionists as excellent nutrient sources and important additions to a healthy diet and are included within the United States Department of Agriculture (USDA) dietary guidelines for healthy eating. Culturally, juice and orange juice in particular have a direct association with breakfast meals. In the United States, these preferences have come under attack by low-carbohydrate diet proponents and adherents.

In the 1970s, a book detailing the benefits and guidelines for a low-carbohydrate lifestyle was written by Dr. Robert Atkins and it eventually sold 10 million copies worldwide. After the diet faded from public view for nearly two decades, Atkins republished the diet book in 1992 as *Dr. Atkins' New Diet Revolution*. This book triggered another wave of high-protein, low-carbohydrate dieters, although the diet did not reach widespread popularity until the late-1990s when Atkins' book became a bestseller. This bestseller status has directed public and media attention towards low-carbohydrate lifestyles developed by Dr. Atkins and other doctors who have created similar diet plans that follow the low-carbohydrate philosophy. These diets, in many

cases, specifically encourage diet adherents to decrease or completely eliminate consumption of fresh fruit and/or fruit juices while dieting.

On average, an eight ounces glass of orange juice has 27 grams of carbohydrates. Many low-carbohydrate diets advocate limiting daily carbohydrate intake; the Atkins diet recommends that dieters limit daily carbohydrate consumption to 20 grams per day during the first phase of the diet and to 30 grams per day during the second phase of the diet. Because recommended daily carbohydrate limits by low-carbohydrate diet proponents is less than the amount of carbohydrates in an eight ounce glass of orange juice, orange juice is a food product considered high in carbohydrates and consumption is typically reduced by consumers following a low-carbohydrate diet.

Florida orange juice growers hold the low-carbohydrate dieting trend at least partially responsible for recent decreases in United States per capita orange juice consumption. According to Weinraub (2004), who reported research conducted by AC Nielsen for the Florida Department of Citrus that involved random surveys of 2,600 U.S. households in December 2003, 26 percent of the people surveyed intentionally reduced their orange juice consumption over the past year. Of that 26 percent, 35 percent reported that they did so due to low-carbohydrate dieting.

Problem Statement

Given decreases in U.S. orange juice consumption since the late 1990s and the high volume of diet and health-related information made available to the consuming public via various channels in the mainstream media, citrus growers would like researchers to determine if an inverse causal relationship exists between increased media attention towards low-carbohydrate diets and decreased orange juice purchases in the United States. It may also be beneficial to agribusiness firms to determine whether or not

diets occur in cycles and if these “diet life cycles” can be defined by the intensity of topical media coverage of diets and/or diet book popularity.

Researchable Question

This research focused on the following question: How has the cultural history of dieting in the United States over the past 20 years affected consumer demand for orange juice?

By answering this question and addressing related issues, a better understanding of diets and dieting in the United States and the effect that such consumer behavior has upon the purchasing of food products, specifically orange juice, can be attained. Such information can be vital to the agricultural sector and specific agricultural industries, such as the orange juice industry, when facing changes in demand for food products due to diet trends and associated purchasing and consumption behaviors.

Hypotheses

In the process of addressing the researchable question, two hypotheses are tested. These hypotheses involve testing for relationships between diets and purchasing habits as well as the relationship between diets and frequency of diet media coverage as found in national and regional newspapers, magazines, and diet books.

1. Dieting trends occur in cycles, such that they follow a cyclical pattern similar to the product life-cycle theory.
2. Demand for orange juice is correlated with diet media coverage in the media.

Objectives

The first hypothesis is addressed by graphically analyzing the popularity of low-carbohydrate diets and dieting. The frequency of newspaper and magazine articles written about low-carbohydrate diets serve as a proxy for diet popularity in this study, as

do weekly bestseller rankings of popular diet books. All data sets are graphed to discern whether or not a diet life cycle similar to the product life cycle curve is defined by the popularity of a diet as measured by diet media coverage and diet book popularity.

To address the second hypothesis, U.S. and Southern region orange juice purchases from October 1995 through January 2005 data are used to estimate consumer demand. Content analysis is then used to generate quantified measures of low-carbohydrate diet media coverage. Collected media coverage is then overlaid to coincide with purchase data periods. The model for consumer demand is then defined as a function of a set of independent variables, including a diet media coverage variable representing the frequency of media articles regarding low-carbohydrate diets and dieting. Other explanatory variables in the demand analysis included real price, existence of field staff working for the Florida citrus industry, gross rating points as a measure of advertising intensity for citrus promotions, and per capita discretionary income.

A Brief Overview of What Follows

In Chapter 2, relevant literature is discussed regarding the cultural history of dieting in America and elsewhere throughout history, consumer behavior research pertaining to the use of health information and the effect of health motivation upon decisions and behaviors, the use of content analysis as a tool for measuring the degree to which media sources address issues in society, and finally the product life cycle theory, which is applied in Chapter 4 to examine potential diet trends.

The method used to collect diet media coverage data from national and regional newspapers and magazines, as well as weekly bestseller rankings for popular low-carbohydrate diet books is discussed in Chapter 3. In addition, a discussion is presented

concerning the use of scanner purchase data as a proxy for orange juice consumption. The variables considered for the base model are also described.

The first hypothesis is addressed in Chapter 4 by discussing and applying the product life cycle theory through graphical analysis of the frequency of news and magazine articles and popularity of diet books as defined by national bestseller lists, over time. The second hypothesis is addressed in Chapter 5, in which the econometric model of consumer demand for orange juice is discussed. Summary of the research implications and suggestions for future research are discussed in Chapter 6.

CHAPTER 2 LITERATURE REVIEW

This literature review is divided into six major topic areas, within which a number of these sections are further divided into subsections. The topic areas are: Diets and Dieting in America, United States Orange Juice Industry, Health Information Sources, Content Analysis, Book Popularity, and Life Cycle Theory.

Diets and Dieting in America

“Reducing has become a national pastime ...a craze, a national fanaticism, a frenzy...” wrote a journalist in 1925, who concluded that, “People now converse in pounds, ounces, and calories.” To this day, this national pastime of reduction and dieting encompasses almost as much national and collective passion as American baseball and mom’s apple pie. Interest in dieting and weight reduction continue to endure and as of late, consumers have added to their vernacular such diet terms as “low carbohydrate,” “POINTS,” “good fat,” “bad fat,” “good carbs,” and “bad carbs” (Schwartz 1986, 183).

Diet Culture

The term, “diet” typically refers to those things customarily eaten. That term, however, according to Gruber (2002) is now used to describe an attempt to lose weight. Most recently, many of those dieting have reported to be following a low-carbohydrate lifestyle. The types of diets that people have followed throughout history are continually changing, although in many cases diets are reinvented; such is the case with the high-fat, low carbohydrate diets which were first introduced in Germany in the 1880s:

Each time the diet has reappeared, it has been impervious to its past. The rejuvenation of diets is as much a part of the culture of slimming as the rejuvenation of the dieter... the dieter is therefore little disturbed by the apparent contradictions between one diet and the next. It is not as if a dieter follows a logical program or steps progressively from a worse diet to a better diet. (Schwartz 1986, 6-8)

Diets do seem to occur in a cyclical pattern, insomuch that the popular diet of the times is generally replaced as the people find that it is no longer successful. Schwartz calls this “the typical chronicle of slimming” which encompasses, “a discrete set of flashing points, enlightenment to dark age to enlightenment, discontinuous and disappointing...the more obvious the vicious circle, the more extreme the next diet.” Schwartz also notes that these diets seem to appear, “out of nowhere, in no time at all, like barbarians or wandering saints, and they seem to disappear as easily and as swiftly as they come” (Schwartz 1986, 6).

Schwartz continues his criticism of diets and dieting while recognizing that dieting has not only retained its popularity throughout history, but that dieting has also been incorporated into many facets of American culture:

Diets have come and gone, but the passion for slimming has mounted steadily. Weight watching and dieting have become a part of the customary fabric of American society, from the nightclub to the nursery. Slimming...is the modern expression of an industrial society confused by its own desires and therefore never satisfied. On the one hand we seem to want more of everything; on the other hand we are suspicious of surplus. (Schwartz 1986, 5)

Demographics of Dieters

According to Simmons Market Research (2004), 40.3 million Americans, 19.5% of the population, are currently controlling their diet. More women than men are controlling their diets, 26% and 12% of the population, respectively. This trend holds across various diet-related activities and attitudes. After gender, the major demographic category for indicating who is controlling their diet is by age group, with those adults ages 45-54 at an

index of 117, or 17% above the adult norm. Additionally, those living in the West are 16% above the norm, when compared with populations in other U.S. geographic regions.

According to the same study, researchers found that for those consumers who are willing to try any new diet, Blacks are more than twice as likely as the adult norm to try a new diet, and those consumers living in households of five or more persons are 52% more likely. Women are also more likely than the adult norm to try new diets, as are those consumers who reside in the South. Adults either under the age of 35 or older than 55 are significantly more likely to try new diets as well.

Researchers also discovered that indicators for likelihood to control diet include individual income, educational attainment, and age for both men and women. Those women earning \$75,000-\$99,999 are 29% more likely than other women and men earning \$100,000-\$149,000 are 52% more likely than other men, to control their diet. Educational attainment is the second highest indicator for both women and men, as those who attended graduate school are 26% and 39% higher than the respective gender average. A final indicator seems to be age; both men and women between the ages of 45-54 are higher than their average counterparts to diet: 22% above the U.S. norm for females, and 18% above for males (Simmons Market Research, 2004).

Low-Carbohydrate Diets

As with many diets, the recent low-carbohydrate dieting trend is a re-invention of the low-carbohydrate diets of the 1970s. The interest in low-carbohydrate diets during the 1970s was prompted by Dr. Robert Atkins, who at the time published, “The Diet Revolution,” which described a weight-loss plan which incorporated a high-protein, high-fat, and low-carbohydrate diet. The low-carbohydrate diet, however, began much earlier than the 1970s and by historical accounts is attributed to an aural surgeon, Dr. William

Harvey, who prescribed a diet in the 1860s “free from farinaceous [starchy] and saccharine [sugary] foods” for a London undertaker, Mr. William Banting.

Mr. Banting, who suffered from deafness due to fatty matter in the throat pressing upon his Eustachian tubes, was a patient of Dr. Harvey. Dr. Harvey based his recommendation to Mr. Banting upon a lecture by French physiologist Claude Bernard on excess sugar in the liver of diabetics. Banting’s diet consisted of lean meat, dry toast, soft-boiled eggs and green vegetables, resulting in a total loss of 52 pounds by 1864 and clear hearing. Overjoyed by his weight-loss success, Banting wrote and printed his “Letter on Corpulence.” By his death in 1878, more than 58,000 copies of the diet pamphlet had been sold, and “Banting” became synonymous with “reducing” (Schwartz 1986, 100-101).

According to other sources, Banting’s booklet had sold as many as 68,000 copies within six years of the first printing, after having been translated into German and French. Banting went on to publish three more revisions to his booklet and received letters from over 2,000 individuals claiming success while adhering to his diet principles (Gruber, 2002). By the 1880s, American physicians discovered that Banting’s diet had become the most common method of dieting to lose weight as the laity began to adopt it by word of mouth, and the principles entered into the lore of cooking schools (Schwartz 1986, 101).

Dr. Atkins’ New Diet Revolution

Low-carbohydrate diets have become the most recent dieting trend in the United States, becoming popular after Dr. Atkins republished his 1970s dieting bestseller as, “*Dr. Atkins’ New Diet Revolution.*” Although the book was released in 1992, it did not appear on *The New York Times* Paperback “Bestsellers List for Advice, How-to and

Miscellaneous” until April 1996. It was then that the low-carbohydrate diet was again reborn into popular culture and began its ascent to becoming the popular dieting trend of the late 1990s and into the 21st century.

Since the book bestseller lists have become an acceptable gauge of book popularity, weekly rankings from *The New York Times* and *Publisher’s Weekly* are investigated in Chapter 4 as potential measures for diet popularity. The diet’s popularity was also revealed through marketing agreements between the parent company of the Atkins’ diet, Atkins Nutritionals Inc., and restaurants such as TGI Fridays and Subway to carry items on menus approved for use while on the Atkins’ low-carbohydrate diet (Horovitz, 2004).

Dr. Agatston and *The South Beach Diet*

A variation of Dr. Atkins’ low-carbohydrate diet, *The South Beach Diet* book by Dr. Arthur Agatston, was released in April 2003 and immediately appeared on *The New York Times* Hardcover Advise Best-Sellers List. Although the diet is generally considered to have an emphasis on decreasing carbohydrate consumption, a posting on *The South Beach Diet* website states that the diet is not focused on a low-carbohydrate or low-fat lifestyle, but rather focused on, “...learning the basics of good nutrition, which involves choosing good carbs and good fats—and knowing which ones to avoid.”

As of December 2004, *Atkins New Diet Revolution* had only been printed in paperback and *The South Beach Diet* book had only been printed in hardcover. Since these books with different bindings are ranked on separate bestseller lists, it is difficult to determine which diet book, Atkins or South Beach, was most popular during a given week. It is important to note that several celebrities have become “diet success stories,” such as Bette Midler, Nicole Kidman and former President Bill Clinton. Like the Atkins diet company, South Beach also agreed to marketing deals with major food companies,

such as Kraft Foods, to carry *The South Beach Diet* seal on the packages of various products approved under the diet plan (Horovitz, 2004).

Application of Diet Literature

The information gathered pertaining to the diet history and culture in the United States helps to set the stage for the study, by identifying the impact that dieting has upon culture. In addition, this section of the literature review also introduces the types of health information generally associated with a popular dieting trend. A specific example is the use of books or pamphlets to circulate diet information, as was done by Mr. Banting in the late 1880s and more recently by Dr. Atkins and Dr. Agatston. Finally, this section helps to lay the groundwork for understanding how diets may occur in cycles, which directly relates the first hypothesis of the study.

United States Orange Juice Industry

Considered to be a “Cinderella story” of the food industry, the development of frozen concentrated orange juice helped to catapult the demand for orange juice in the United States, eventually making it one of the most popular beverages in American history.

The Golden Fruit

The first recorded mention of citron, a large lemon-like fruit and the forerunner of the orange, was in Chinese writings attributed to Confucius, a Chinese philosopher who died in 479 BC. Although this fruit was probably originally bitter, inedible and used primarily as an ornament and for seasoning, the fruit eventually reached Europe and was probably first introduced into the Mediterranean area by Arab traders (Florida Citrus, 1974).

It is believed that although Columbus is rumored to have taken citrus seed along on his second voyage to the New World in 1493, it was Ponce de Leon who probably brought citrus to Florida in 1513 while he was searching for the Fountain of Youth. The earliest groves were developed near St. Augustine and Tampa and commercial production of citrus was confined to these coastal areas for the first 300 years because the only means of transporting fruit was by water (Florida Citrus, 1974).

According to the Glossary of Common Citrus Terms, “the orange has taken on many different forms on its way to the consumer.” Before 1915, less than 1% of all oranges were processed. In the late 1930s and particularly during World War II, the “juice for breakfast fad” grew steadily because orange groves (particularly in Florida) began to expand and consumers had more disposable income than ever before. The U.S. government prescribed fresh fruit for the armed services and following World War II, an overproduction of oranges emerged. In response to this overproduction, three research scientists, MacDowell, Moore, and Adkins, developed a process for frozen orange concentrate that involved vacuum evaporation. This “taste like fresh product” helped recover the slack in demand for single-strength juice and fresh consumption from 1950 to 1970 (Florida’s Golden Fruit, 1977).

The status of orange juice as a “Cinderella story” of the food business is based on its widely successful introduction into the market. Frozen concentrated orange juice production increased from 225,000 gallons during the 1945-46 season to over 186 million gallons during the 1975-76 season. “The nation embraced the product like nothing since Henry Ford’s model T, and Florida citrus vaulted into the world’s number one agricultural industry (Florida’s Golden Fruit, 1977, 67).”

Florida Department of Citrus

The Florida Department of Citrus (FDOC) is an executive agency of the Florida state government charged with the marketing, research and regulation of the Florida citrus industry; the agency's mission is to help grow the demand for Florida citrus products, providing a direct benefit to the state's citrus growers.

According to the FDOC website, FDOC programs are funded by a tax paid by citrus growers on each box of citrus that moves through commercial channels, which is spent on advertising and promotional activities for Florida citrus in the United States, Canada, Europe and Asia. In addition, the FDOC also has regulatory responsibilities, including research, production, fertilizing, maturity standards, harvesting, licensing, transportation, labeling, packing and processing.

FDOC funding also provided for field staff posted in major U.S. markets that worked with retailers and food service providers to promote Florida Citrus and helped retailers in the areas of merchandising, in-store promotions, as well as with category management such as allocating shelf space. They also helped coordinate Florida Department of Citrus generic advertising with retailer promotions. Since March 2001, however, the field staff has been largely eliminated.

Recent Orange Juice Consumption Trends

Frozen concentrated orange juice became very popular with American consumers, which drove much of the growth of orange juice consumption in the United States. Like most food products, however, the form that orange juice has taken over the years is attributed, in part, to changing consumer tastes and preferences. During the 1985-86 season, consumers began to purchase more chilled than frozen orange juice product, a change attributed to consumers' desire for convenience. The next big shift in

consumption trends of orange juice occurred during the 2001-02 season when consumers began to purchase more not-from-concentrate (NFC) product than product that was either frozen concentrate or reconstituted. This shift is attributed to consumer perceptions of quality associated with NFC orange juice products and a continuing preference for convenience.

Industry Snapshot

As consumers' buying behavior has shifted towards NFC orange juice products, brand labels have grown in popularity. During the 2002-03 season, the top three brands in the market (Tropicana, Minute Maid, and Florida Natural) were responsible for 62.6% of total orange juice purchases and 90.2% of NFC purchases. Brand names and store brands also have held the largest market shares for reconstituted orange juice products. In addition to the changes in product form, packaging of orange juice has also changed, moving away from canned and glass containers towards carton and plastic containers (FDOC).

Regional Consumption

The decline for orange juice began in the late 1990s and has continued steadily, although at differing rates and varying trends among geographic regions of the U.S. The southeastern region is defined by ACNielsen as including states south of Oklahoma, Arkansas, Kentucky, West Virginia, and Maryland. This region has the highest total regional consumption of orange juice, although it is the northeastern region that has the highest per capita consumption.

Not-from-Concentrate products have the highest market share in the northeast region, while reconstituted and NFC products have comparably high market shares in the southern region. Consumers in the western and north central regions tend to prefer

frozen and reconstituted product, which is attributed to the cost incurred through the transportation of water from Florida (as would be included in Not-from-Concentrate orange juice products).

Consumer Profile

According to data collected by AC Nielsen for the 2002-2003 growing season, consumers of orange juice tend to be affluent and Hispanic or African American. Additionally, consumption of orange juice increases with education, household income, and household size (FDOC).

Dieting and Orange Juice Consumption

According to Weinraub (2004), slightly fewer than 80 percent of American households were buying orange juice in June 2004, as compared to approximately 81 percent of households in 2002. This decrease in consumption was particularly noticeable in the "heavy user" category, which is defined as households that consume 12.5 gallons or more annually. According to the FDOC, this shift in consumer behaviors has been attributed to three factors: 1) dieting; 2) consumer growing interest in nutrition and eating well; and 3) negative messages about orange juice (FDOC).

According to AC Nielsen (2003), "As many as 25 million people have tried the Atkins diet alone...which doesn't even include other low-carb programs. These new trends are changing the way consumers perceive nutrition and health, and marketers are beginning to adapt to these new regimens (20)." Crotty (2003) stated that among dieters, 40% said that they plan to consume less juice, mainly to avoid sugar and that only 8% indicated that they planned to consume more orange juice.

Application of Industry Literature

Because of the potential significance of diet cultural trends on the demand for orange juice, understanding the continual development of orange juice as a product is significant. This body of literature also helps to frame the problem statement and objectives, as stated in Chapter 1. The information gathered on recent consumption trends, especially the observation that the shift towards increased purchases of the more expensive NFC orange juice product highlights a possible problem with the data if average price rather than a weighted price (based on relative market share of NFC, reconstituted, frozen concentrate, and shelf stable) were to be included in the regression analysis.

Health Information Sources

According to Moorman and Matulich (1993), there are two behaviors that should be taken into account when considering the role of health information and its potential influence on individual choices: health information acquisition behaviors and health maintenance behaviors. Health information acquisition behavior is the degree to which a consumer acquires health information from various sources, including media and labels, friends and family, and health professionals. Health maintenance behaviors refer to the degree to which a consumer performs health-enhancing behaviors, including utilizing health professionals for check-ups, improving dietary intake, minimizing stress, moderating alcohol consumption, and eliminating tobacco use.

MacInnis, et al (1991) define health motivation as the, “consumers’ goal-directed arousal to engage in preventative health behaviors (34).” This incorporates the consumer’s willingness to perform and interest in performing health behaviors, such as dieting and weight reduction. According to Celsi and Olson (1988), health motivation

activates consumers and drives them to pursue health behaviors. These behaviors are presumably important goals or values and hence motivated consumers devote more attention to and exert greater cognitive effort towards the processing of relevant information. Moorman and Matulich (1993) also address health motivation, stating that it stimulates consumers to put their knowledge, skills, or resources into practice. Consumer research literature supports that health knowledge and education levels reflect an expertise that assists in health information processing and selecting health behaviors. Alba and Hutchinson (1987) found that highly knowledgeable consumers acquire and retain more information and that knowledge eases the encoding of information. Additionally, Moorman and Matulich (1993) found that income reflects consumers' financial ability to implement health behaviors.

Moorman and Matulich (1993) conducted a survey of consumers, comparing lower- and higher-income consumers and young and elderly consumers. Their research revealed that health motivation increases the amount of health information acquired from media sources, health professional contact, diet restriction, and diet addition, but not information acquired from casual sources (such as friends and family). Additionally, higher use of media sources for health information was found for highly motivated but more able consumers, who were characterized by high health knowledge and high income. Moorman and Matulich also indicated that the acquisition of media information did interact with the restriction of negative dieting elements.

In terms of health behaviors, Moorman and Matulich (1993) concluded that consumers were more influenced by information from media sources rather than information from casual sources. This was attributed to the fact that health information

typically involves an idea, product, or practice that is essentially new for consumers; therefore, health information may be thought of as an innovation. Rodgers (1983) suggests that the information provider and receiver should be different enough (in terms of expertise, values, or beliefs) from one another that the receiver perceives the provider as having credibility and in turn values the information. Perhaps this explains why casual sources, which may be seen as too similar to themselves by consumers, are not valued as highly as media sources.

According to the American Dietetic Association's (2002) consumer research study, media is a major contributor to nutrition and health knowledge. Answering an open-ended question about their chief sources of nutrition information, in which they could give more than one answer, 72 percent of consumers named television as a chief source of nutrition information. Popular magazines and newspapers were also ranked as chief sources of nutrition information by 58 percent and 33 percent of respondents, respectively. Books, including references and general-interest publications, were identified by 15% of respondents as chief sources of nutrition information.

Application of Health Information Literature

Since this research study is primarily concerned with the effect that health information, specifically information about low-carbohydrate diets, the Atkins diet, and *The South Beach Diet*, has had upon purchases of orange juice, it was important to identify how consumers process health information. In addition, the literature regarding health motivation and the effect that increased health motivation has upon the amount of health information acquired also provides further depth to the study. Similarly, the premise that people who are concerned about their health and/or weight will have higher health motivation and therefore acquire more health information as compared to

counterparts who are not as concerned about their health and/or weight is insightful. This body of literature also suggests that purchase decisions are not necessarily directly affected by health information if health motivation for each individual is not present.

Health information is a general term which includes sources of information ranging from doctors and dieticians to newspapers and magazines. For this study, the focus will be on health information collected from newspapers and magazines, which will be identified as “diet media coverage.”

Content Analysis

Kolbe and Burnett (1991) define content analysis as, “an observational research method that is used to systematically evaluate the symbolic content of all forms of recorded information,” and suggest that content analysis provides an empirical starting point for generating new research evidence about the nature and effect of specific communication (243). This method, however, is susceptible to the effects of researcher biases, which can affect decisions made in the collection, analysis and interpretation of data. According to Kassarian (1977), the content analysis method is a formal methodology used in political science, journalism, social psychology, and communications research. In those fields, the content analysis method is described as a research technique for the, “objective, systematic, and quantitative description of the manifest of content communication; the scientific analysis of communication messages that requires rigorous and systematic analysis; a systematic technique for analyzing message content and message handling (8).”

According to Neuendorf (2002), content analysis is as easy—or as difficult—as the researcher determines it to be and is not necessarily easier than conducting a survey, experiment, or other type of study. The term content analysis does not apply to every

analysis of message content. A content analysis summarizes, rather than reports, all details concerning a message set and much of content analysis literature concentrates on manifest content, or the “elements that are physically present and countable (15).”

Content analysis may be conducted on written text, transcribed speech, verbal interactions, visual images, characterizations, nonverbal behaviors, sound events, or any other message type. Neuendorf also notes that the term text analysis refers to the specific type of content analysis that focuses on written or transcribed words.

Relation to Scientific Method

According to Neuendorf (2002), content analysis as a research method is consistent with the goals and standards of survey research. In content analysis, an attempt is made to measure all variables as they naturally or normally occur. Additionally, content analysis is a design that meets the requirement of objectivity and inter-subjectivity through its *a priori* design since all decisions on variables, their measurement and coding are made prior to observation. For content analysis, reliability is an extremely important factor, especially when human coders are used. Without acceptable levels of reliability, content analysis measures are meaningless.

Typical Process

Neuendorf describes the typical process of content analysis research as including nine steps:

1. Theory and rationale, what content will be examined and why;
2. Conceptualization, what variables will be used in the study and how are they defined conceptually;
3. Operationalizations, measures should match conceptualization to prove internal validity and the unit of data collection;

4. Coding schemes, (whether human or computer coding is used) a codebook and coding form should be created which fully explain what variables will be measured;
5. Sampling, census of the content possible or how a subset of the content will be randomly sampled;
6. Training and pilot reliability, agree on the coding and note the reliability on each variable;
7. Coding, use at least two coders to establish intercoder reliability. Coding should be done independently with 10% overlap for reliability test;
8. Final reliability, calculate a reliability figure for each variable; and,
9. Tabulation and reporting, figures and statistics may be reported using univariate or multivariate techniques.

Neuendorf (2002) also notes that over-time trends are also a common reporting method. In the long run, relationships between content analysis variables and other measures may establish criterion and construct validity.

For a content analysis to be generalizable to some population of messages, the sample for the analysis should be randomly selected. Randomness may be defined as follows: Every element (unit) in the population must have an equal chance of being selected. In the case of a small population, there may be no need to draw a smaller, representative sample of the population. Rather, all units in the population may be included in the study (i.e., a census).

Application of Method

Predictive content analysis has as its primary goal the prediction of some outcome or effect of the messages under examination. By measuring key characteristics of messages, the researcher aims to predict receiver or audience responses to the messages. A type of predictive content analysis that has been gaining popularity is the prediction of public opinion from news coverage of issues. For example, Hertog and Fan (1995) found

that print news coverage of three potential HIV transmission routes (toilets, sneezing, and insects) preceded and was significantly related to public beliefs about those routes as expressed in polls.

Shoemaker and Reese (1996) developed a model of research domains for typologizing mass media studies. Their proposed domains are as follows: a) Source and system factors affecting media content; b) Media content characteristics as related to audience's use of and evaluation of content; c) Media content characteristics as predictive of media effects on the audience; D) Characteristics of the audience and its environment as related to the audience use and evaluation of media content; and E) Audiences' uses of and evaluation of media content as related to media's effects on the audience.

Breen (1997) searched the Lexis Nexis database for all newspaper articles in major papers during certain periods occurring between 1991 and 1994 that included the key search terms, "catholic" and "priest" or "clergy" within two words of each other. The search yielded a set of articles that served as the population from which he then drew a sample. According to Riechert (1995), such a key-word search procedure does not retrieve every article on the topic, but it yields a reasonable sample of sufficient size for meaningful analysis. He also concluded that duplicate articles yielded by the search should be eliminated from the population to be sampled, as are articles unrelated to the topic of concern.

The International Food Information Council Foundation has, since 1995, conducted Food For Thought, a quantitative and qualitative analysis of the food news published by more than three dozen major national, regional, and targeted local news outlets, including network television, major magazines and newspapers, and health and nutrition Internet

sites; each report covers a two-year interval. The report issued for 2001-2003 tracked news reports in 40 media outlets over a three-month period in 2003 and indicated that obesity and weight management were the top news topics, capturing 15 percent of all news discussions.

Content analysis is being used with increased frequency by a growing array of researchers. According to Neuendorf (2002), a six-fold increase occurred in the number of content analyses published in the *Journalism and Mass Communication Quarterly* over a 24 year period, 6.3% of all articles in 1971 to 34.8% in 1995.

Content Analysis in Agricultural Economics

Within the field of Agricultural Economics, several studies have been conducted investigating the relationship between media coverage and demand for various food products. Most of these studies concentrate on the demand impacts of how various food safety risks are portrayed in the media, both in the United States and abroad. In these studies, media coverage is considered on two levels, sustained media coverage and heightened media coverage. According to Kalaitzandonakes, et al (2005), sustained and heightened media coverage is dependent upon the length of time an issue exists in the media.

Kalaitzandonakes, et al (2005) investigated the relationship between GM ingredient labels, sustained GM-related food risk as portrayed in the media, and demand for frozen and canned food items in the Netherlands. They determined that Dutch consumers did not significantly change their purchasing behavior of biotech foods in response to media coverage. This is the only study found thus far that indicates demand was not significantly changed due to media coverage. Additionally, the media attention directed towards the U.S. Starlink corn case was considered by Kalaitzandonakes, et al

with regards to heightened media coverage of the issue. Results of the research indicated that acute media coverage did influence consumer purchasing behavior and that those changes in consumer demand affected primarily those branded products that were directly identified by the media. The research, however, indicated that the overall change in consumer demand was temporary and rather small.

Van Ravenswaay and Hoehn (1991) investigated the relationship between demand for apples following the Alar scare and sustained media coverage of the food safety issue relating to apple consumption in light of the food scare. Their research indicated a relationship between media coverage and subsequent decrease in demand for apples. Overall, demand for apples decreased by 30% during the 6-year study.

Verbeke and Ward (2001) investigated the relationship between meat consumption and sustained media coverage of hormones and BSE (Bovine Spongiform Encephalopathy, otherwise known as Mad Cow Disease) from 1995-1998 in Belgium and the United Kingdom. Their research indicated a reduction in consumer expenditures on beef over 4 years by 2% in Belgium. In addition, demand for beef in the United Kingdom decreased by 40% after the link between BSE and vCJD (Variant Creutzfeldt-Jakob Disease) was reported.

Piggott and Marsh (2004) investigated the impact of heightened media coverage of listeria, salmonella, E coli, and BSE on U.S. demand for beef, chicken, and pork. Their research revealed that consumers reacted to contemporaneous media coverage of such risks only. Although this result held over a twenty-year time period, the research indicates that the overall economic effects from such consumer response were relatively small.

Swartz and Strand (1981) considered the impact of kepone contamination (a potential carcinogen) on demand for oysters in certain U.S. markets. Their research found that the media had a moderate but temporary negative impact on demand for oysters. After consumer reaction to media coverage of kepone contamination wore off, the research indicates that U.S. consumption of oysters returned to previous levels.

In other contexts, content analysis has been used to identify future implications for research in the Agriculture Economics discipline by Corbett (1997), who examined research articles published in the *Journal of Food Distribution Research* from 1984 through 1998. In a similar fashion, Gempesaw and Albay (1996) conducted a content analysis of the *Agricultural and Resource Economics Review* to determine whether the journal had maintained a strong regional focus and whether or not there had been a narrow concentration of published articles by subject area and methodology.

Concerns to be Addressed

According to Kalaitzandonakes, et al (2005), media coverage is dynamic and it can be difficult for researchers to measure or observe the amount of information accessed and understood by consumers. Additionally, the shaping and revising of consumer perceptions in response to new information subject to lengthy lags and the translation of perceptions into actions is poorly understood.

Application of Content Analysis Literature

The body of literature collected regarding Content Analysis is helpful in identifying the methods used to sample, collect, code, and analyze health information gathered from national and regional newspapers and magazines. The range of use of Content Analysis to determine the effect that media has had upon the demand for particular food products also provides validity and acceptance of the method within the field of Agricultural

Economics. Applications of the method outside Agricultural Economics were also helpful when specifics of the method for this study were considered and applied. This includes the use of media information to gauge public beliefs and attitudes, various sampling techniques, and the use of electronic databases such as LexisNexis to collect media articles for analysis.

Book Popularity

Book popularity is generally measured by sales, and sales data are published on a weekly basis by several organizations. The most well-known and recognized is *The New York Times* Bestseller List, which is published weekly. A second source of bestseller lists used in this research is *Publisher's Weekly*, a 131-year-old international weekly news magazine of the book industry. The *Publishers' Weekly* magazine reaches every major publisher worldwide, and according to the company website, the magazine is the leading publication serving all segments involved in the creation, production, marketing and sale of the written word in book, audio, video and electronic formats.

According to Sornette et al (2004), 138 books from Amazon's Top 50 rankings were analyzed and they concluded that top sellers tend to reach their sales peak in one of two ways. These researchers indicate that many books achieve bestseller status due to "exogenous shocks" such as a major media announcement, a celebrity endorsement, or a dignitary's death. In these cases, the instant rise in sales is followed by a fairly quick decline. However, their research also shows that other books inch their way to the top of bestseller lists over the course of many months, helped by cascades of tiny "endogenous shocks" such as a friend's recommendation. An example is the book, "Divine Secrets of the Ya-Ya Sisterhood," which made the bestseller list two years after publication without ever benefiting from a major ad campaign. Interest in the book was stimulated by book-

discussion clubs that then inspired women to form their own “Ya-Ya Sisterhood” groups. They also concluded that such books descend the rankings more slowly than those propelled by exogenous shocks.

Application of Book Popularity Literature

Given the cultural history of diets discussed earlier in the literature review and the use of pamphlets and books to disseminate information about a particular diet to the general public, the book popularity literature helps to define a method for representing the popularity of a book by using weekly bestseller rankings. Additionally, the literature on the avenues by which books achieve bestseller status are helpful in identifying the differences in popularity between the Atkins’ and South Beach diet books. This body of literature also helps to lay initial groundwork towards the first hypothesis, which involved investigating the existence of a “diet life cycle”.

Life Cycle Theory

According to Lilien and Kotler (1983), the product life cycle model (PLCM) was developed originally to study the sales and profit patterns over time of branded products. According to the Blackwell Encyclopedic Dictionary of Marketing, the product life cycle is based on the belief that most products go through a similar set of stages over their lives, much like living organisms and that as a product moves through the life cycle, marketing strategies may be adapted, although some products display a fad cycle that has no, or a short maturity phase. Johnson (2002) asserts that products, like people and other living things, have life cycles. He also notes that the PLCM is further identified as a managerial planning and control tool that provides a conceptual framework for developing marketing objectives and strategies for different stages of a product's life. Dhalla and Yaspeth (1976) state that another PLC is that of the growth-decline plateau,

where the growth phase is followed by a partial decline to a stable volume that is considerably lower than peak sales.

As identified by Johnson, the PLCM can be divided into four stages: introduction, growth, maturity, and decline. He asserts that these product life cycle stages vary in length since some new products take a long time to gain market acceptance and move into the growth stage, such as appliances and other durable goods, which tend to have long product life cycles. This is in contrast to other products such as toys, novelties, and fashions, which have relatively short life cycles. In addition, Johnson states that high-tech products are also likely to have short life cycles due to the rapid advancement of technology causing many high-tech products to become obsolete quickly.

Applications and Modifications

The PLCM offers a plausible explanation of the relationship between an economic unit and its market over time. Blank (2002) argues that although the model was developed originally to look at specific brand-name products or product lines, it can be extended to firms and to industries because those larger economic units also follow a growth and decline process that is based in the results of sequential decisions.

Blank uses the product life cycle model to develop a framework to answer questions regarding what lessons have been learned from the disappearances of certain industries. He asserts that entire industries can and do disappear and that many of the industries that have virtually disappeared from the American economy produce a commodity, implying that there is something about the structure of industries which makes it possible for those industries to disappear. He observes that the changes over a life span of an industry seem to follow a similar pattern, and this pattern includes a series of time periods over which the total sales and profits of the economic unit first increase,

peak, and then decline and in total, indicates an analytical framework which evaluates economic performance over time, such as the “product life cycle” model (PLCM), which he then modifies for use in analyzing the American agriculture production industry.

Heller (1999) discusses how companies have life cycles and how those life cycles are linked with products sold by a particular company. He suggests that what drives the life cycle of a company with regards to the popularity of brands and products is originality, which in turn provides opportunities for company growth. Heller suggests that downturns in the life cycle of companies may be due to company management, who are unable to adapt the company, and or products remain unchanged while markets move forward.

Modis (1994) discusses life cycles in terms of “survival of the fittest,” and claims that the filling or the emptying of a niche in a competitive environment follows an S-shaped pattern of natural growth. In such a pattern of growth, the rate of growth is greatest in the middle of the life cycle and then diminishes as growth reaches saturation level.

In his application of the life cycle theory, Modis fit S-curves to populations of computers, specifically a computer model that was popular in the mid-1980s. When the analysis was first completed in 1985, he concluded that the product was phasing out, something that marketers denied vehemently at the time. Modis notes that these marketers spoke of plans to advertise and repackage the product in order to boost sales, although when sales during the following three years were in line with his projections, he concluded that promotional activities, price changes, and competition in general were conditions present throughout a product's life cycle and would not change the course of a

natural phasing-out process because these new programs were not significantly different from those of the past. With respect to computers, Modis notes that the use of the life cycle as a tool became complicated as new computer models began entering the market in rapid succession with little differentiation and that products which are well-positioned within a market niche are typically long-lived. To take into account the overlap effect of products within a product category and because life cycles of products are short and behave irregularly, Modis suggests that growth-curves be used to describe a whole family of products or a whole generation of technology.

Application of Life Cycle Theory Literature

Given the first hypothesis of the study, to determine the existence of a “diet life cycle,” it is important to gain a clear understanding of the theory which supports the Product Life Cycle concept. Additionally, this area of the literature review provides examples of research in which the product life cycle has been modified in order to analyze, for example, a specific industry or trend. The body of theory does suggest the possibility of modifying the product life cycle concept in order to explain the relationship of some unit of analysis, for example, health information over time.

As suggested by Heller in the previous section, the life cycle may be based upon originality of an idea (or product). This statement is also supported by Modis, who suggests that longer-lived products are positioned within a niche market and that competing products (or ideas) entering the niche market will affect the longevity of the original product. This can be applied to the idea that information about diets and dieting is a market in which information is demanded by consumers and supplied by doctors, corporations, the media, private individuals, etc. As information about a particular diet trend enters the marketplace, it does so with a certain degree of originality as compared to

the replaced or previous dieting trends. As the demand for information relating to the dieting trend increases, competition floods the diet information market, eventually reaching a point of saturation, resulting in a loss of originality. The cycle repeats itself as a new and more original diet trend becomes popular and information about that diet trend is demanded and supplied, increasing to yet another point of saturation.

In addition, the use of the life cycle theory applied to a “generation of technology,” such as the low-carbohydrate dieting trend, may be more useful than considering only the life cycle of a particular diet, such as the Atkins or South Beach diet.

CHAPTER 3 DATA COLLECTION AND ANALYSIS

A database was compiled of newspaper and magazine articles on diets and dieting in the United States from 1995 through 2004. In addition, data from national bestseller lists were collected from 1996 through 2004. These articles and bestseller lists provide data that are related to the research hypotheses: that dieting trends occur in cycles, such that they follow a cyclical pattern similar to the product life-cycle theory and that demand for orange juice is correlated with health-and diet-related information in the media.

National and Regional Media Data Collection

The content analysis method was used to collect, code, and analyze popular news media sources for articles relating to low-carbohydrate diets and dieting. Newspapers and magazines were selected based on circulation, a method similar to that which was used by the International Food Information Council Foundation (2003) in their report “Food for Thought.”

Electronic Databases

Data collection targeted articles that were printed in national and regional news sources and were available through the University of Florida electronic library databases. During the data collection, three electronic databases were used: Factiva for all regional and all but one national newspaper, ProQuest for the remaining national newspaper, and InfoTrac for all national magazines. Each of these databases allow for keyword searching within a specified date range and access to full text versions of the articles meeting specified search criteria. Across these three databases there is no difference

between truncation rules, which allow for variations of a keyword to be included in the search.

This method is similar to the method employed by Breen (1997), who searched LexisNexis, a database similar to those used in this research, to collect newspaper articles in major papers from 1991 through 1994 by employing key search terms.

Sampling

In content analysis, the unit of analysis is an identifiable message or message component, which serves as the basis for: 1) identifying the population and drawing a sample, (2) determining which variables are measured, and/or (3) which variables serve as the basis for reporting analyses. Units can be words, characters, themes, time periods, interactions, or any other result of “breaking up a ‘communication’ into bits” (Carney, 1971).

The sampling for this analysis included a combination of sampling techniques. The first technique, stratified sampling, was used when selecting what news media sources were included in the analysis. The second technique employed was cluster sampling, in which articles containing established keywords and printed from October 1995 through December 2004 were included in the analysis (Breen 1997). Duplicate articles and those unrelated to the topic of concern yielded by the various keyword searches were eliminated from the analysis, as suggested by Riechert (1995).

Data Collection

For each newspaper or magazine, the appropriate database was selected and using the database search engine, archives were searched for all articles published from October 1995 through December 2004 for each keyword string described below. Topical coding of articles was completed as articles were collected from the electronic databases,

by searching for keywords as found in the citation or lead paragraph. The occurrence of a search term in each article's citation or lead paragraph was used as an indication that the article was related to the topic of concern. All collected articles were also examined to ensure that duplicate and unrelated articles were eliminated from the analysis. Coding did not commence until after all the sampling was completed.

Coding

Articles were sorted and coded according to the type of publication (national newspaper, regional newspaper, or national magazine), source (*New York Times*, *Atlanta Journal-Constitution*, *Time Magazine*, etc) and date published. Articles were then grouped into four-week intervals corresponding with the orange juice scanner purchase data collected from ACNielsen. This provided thirteen observations per year, with a total of 122 national observations from October 1995 through December 2004 and 105 regional observations from January 1997 through December 2004.

Time Periods Considered

Articles from national newspapers and magazines were collected from October 1995 through December 2004, corresponding with the purchase data available from ACNielsen representing purchases of 100% orange juice at drug stores, mass merchandisers (i.e., Wal-Mart, Target, etc), and grocery stores with retail sales of two million dollars or more. Articles from regional newspapers were collected from January 1997 through December 2004. This time interval was selected in order to capture the frequency of media coverage immediately preceding the decline in purchases of orange juice in the southern region, continuing through 2004. Bestseller rankings for "*Atkins' New Diet Revolution*" were collected from January 1996 through December 2004, and

from April 2003 through December 2004 for “*The South Beach Diet*,” both of which reflect the time intervals for which each book appeared on the weekly bestseller lists.

National Newspaper Analysis

The five largest newspapers (in terms of circulation) with circulation over 1,000,000 were considered for this analysis. As reported by the Audit Bureau of Circulations, these newspapers are listed in Table 3.1.

Table 3.1: Newspaper Circulation, Greater than 1 Million Copies Sold.

Newspaper	Location	Circulation
USA Today	New York City, NY	2,665,815
Wall Street Journal	New York City, NY	2,106,774
New York Times	New York City, NY	1,680,583
Los Angeles Times	Los Angeles, CA	1,292,274
Washington Post	Washington, DC	1,007,487

Source: Audit Bureau of Circulations (2004) “Top 150 Newspapers”

According to the Factiva database, The Wall Street Journal is a national daily newspaper serving the business community with influential reports on companies, markets, politics and international news. Since it is primarily read by business professionals rather than the general public, the Wall Street Journal was excluded. This condensed the analysis to four newspapers: the USA Today, *The New York Times*, the Los Angeles Times, and the Washington Post.

Keyword Search

In order to collect articles concerning low-carbohydrate dieting printed from October 1995 through December 2004, keywords were used to capture all articles relating to low-carbohydrate diets. Articles from all national newspaper sources with the exception of the Los Angeles Times were collected using the Factiva database. The ProQuest database was used to collect Los Angeles Times articles. Keyword strings were used to search the headline and lead paragraph in Factiva and the citation and abstract in

ProQuest. Since articles were collected on the basis of an article's topical content, (i.e., low-carbohydrate diets), these two methods of searching the articles returned comparable results.

In both the Factiva and ProQuest databases, articles were collected on one of two bases: 1) That the article contained the words low and any variations on the words carbohydrate and diet; 2) That the article contained any variations of the word diet and either the term Atkins or South Beach. This second criterion was considered essential since many news articles were thought to provide information relating to the low-carbohydrate dieting trend in addition to providing information about either of the two major diet plans associated with low-carbohydrate dieting, Atkins or South Beach.

These keywords were selected with regards to the AP Stylebook and Briefing on Media Law, which notes that it is generally unacceptable to include slang words in a keyword search. The search terms, however, have been designed in such a way that articles including slang terms associated with the topic are also captured, i.e. "carb" instead of "carbohydrate." Additionally, the term low was included so that only those articles relating to reduced-carbohydrate diets were collected, rather than articles pertaining to high-carbohydrate diets (such as used by athletes).

A summary of the national diet media coverage data collection is provided in Table 3.2. This table also shows the number of articles collected for each search term and the total number of articles excluded within each newspaper source. Table A.1 in Appendix A lists the summary of articles collected by period from October 1995 through December 2004.

Table 3.2: Summary of National Newspaper Data Collection

Publication Name	Search Terms		Excluded: Duplicates, Un-Related Topic	Total Sample
	low and “carb” and diet	Atkins or South Beach and Diet		
USA Today	60	117	104	73
New York Times	80	110	72	118
Los Angeles Times	128	121	128	121
The Washington Post	61	74	61	74
Grand Total	329	422	365	386

National Magazine Analysis

Magazines with the greatest paid circulation and classified as general news, general health, female-specific, or male specific were identified. According to the Magazine Publishers of America, the magazines with the largest circulation in these categories are listed in Table 3.3.

Table 3.3: Magazine Circulation, Highest Paid Circulation Within Category.

Newspaper	Category	Circulation
Time	General News	4,104,284
Prevention	General Health	3,275,411
Better Homes and Gardens	Women	7,608,913
Men's Health	Men	1,686,195

Source: Magazine Publishers of America, (2004) Circulation Trends and Magazine Handbook

Keyword Search

In order to collect articles concerning low-carbohydrate dieting printed from January 1997 through December 2004, keywords were used to capture all articles relating to low-carbohydrate diets. Articles from all selected national magazine sources were collected using the InfoTrac database and keyword strings were used to search the full article text. As with the national newspaper search, articles that met either of the following criteria were collected: 1) That the article contained the words low and any

variation on the words carbohydrate and diet; 2) That the article contained any variation of the word diet and either the term Atkins or South Beach.

A summary of the data collection is provided in Table 3.4. This table also shows the number of articles collected for each search term and the number of articles excluded by magazine source. Table A.1 in Appendix A lists the summary of articles collected by period from October 1995 through December 2004.

Table 3.4: Summary of National Magazine Data Collection

Publication Name	Search Terms		Excluded: Duplicates, Un-Related Topic	Total Sample
	low and “carb” and diet	Atkins or South Beach and Diet		
Better Homes & Gardens	4	0	4	0
Time	13	9	4	18
Prevention	24	4	10	18
Men’s Health	29	4	11	22
Grand Total	70	17	29	58

Regional Newspaper Analysis

In order to further test the hypothesis that demand for orange juice is correlated with health-and diet-related information in the media, a regional newspaper analysis was conducted. In order to collect regional news articles concerning low-carbohydrate dieting printed from January 1997 through December 2004, keywords were used to capture all articles relating to low-carbohydrate diets. The southern region was selected for the regional analysis since the region has historically had the highest consumption of orange juice and is the region closest in proximity to the Florida citrus industry.

According to AC Nielsen, the Southern region consists of 16 states: Texas, Oklahoma, Louisiana, Arkansas, Mississippi, Alabama, Georgia, Florida, Tennessee,

Kentucky, North Carolina, South Carolina, Virginia, West Virginia, Delaware, and Maryland. The newspaper analysis only included newspapers located in this defined geographic area.

Newspapers were selected based on total circulation and newspapers with the largest circulation within the region were considered. The top five newspapers within the southern region geographical area that were available in full text through the University of Florida's library databases are listed in Table 3.5.

Table 3.5: Southern Region Newspaper Circulation.

Newspaper	Location	Circulation
Houston Chronicle	Houston, TX	737,580
Atlanta Journal Constitution	Atlanta, GA	606,246
St. Petersburg Times	St. Petersburg, FL	395,973
The Daily Oklahoman	Oklahoma City, OK	288,948
The Times-Picayune	New Orleans, LA	281,374

Source: Audit Bureau of Circulations (2004) "Top 150 Newspapers"

It is important to note that three of the newspapers with the highest circulation in the region were not available through an electronic database at the University of Florida: The Miami Herald (circulation: 416,530), Fort Worth Star (circulation: 326,803), and Charlotte Observer (circulation: 278,573). All three are owned by the same company, Knight-Ridder, and access restrictions are due to an agreement between the publisher and various electronic databases.

Keyword Search

Since observable decreases in orange juice consumption began in 1998, the regional analysis includes newspaper articles printed from January 1997 through December 2004. In order to collect the articles concerning the low-carbohydrate diet trend, the keyword search terms used for the two previous analyses were also applied to the regional newspaper analysis. Since all articles for the regional analysis were

collected using the Factiva database, sampling was completed based on the occurrence of search terms in the headline and/or lead paragraph.

A summary of the data collection is provided in Table 3.6. This table also shows the number of articles collected for each search term and excluded by newspaper source. Table A.2 in Appendix A lists the summary of articles collected in the Southern region by period from January 1997 through December 2004.

Table 3.6: Summary of Regional Newspaper Data Collection, January 1997 through December 2004

Publication Name	Search Terms		Excluded: Duplicates, Un-Related Topic	Total Sample
	low and “carb” and diet	Atkins or South Beach and Diet		
Houston Chronicle	112	70	70	113
Atlanta Journal Constitution	49	21	28	41
St. Petersburg Times	36	27	30	33
The Daily Oklahoman	3	0	0	3
The Times-Picayune	42	0	9	33
Grand Total	242	119	138	223

Book Popularity as Ranked on National Bestseller Lists

Book popularity is generally measured by sales. Summaries of which are published on a weekly basis by several organizations. The most well-known and recognized bestseller list is published by *The New York Times*. A second, well-known bestseller list is published by *Publishers Weekly*.

Data Collection

Data from book rankings on *The New York Times* Bestseller List were compiled through the LexisNexis database by using a keyword search to obtain all bestseller lists published from January 1996 through December 2004. Information was collected for all diet books appearing on the bestseller lists for the selected time period, with an emphasis

on Dr. Robert Atkins' "*Atkins' New Diet Revolution*" and Dr. Arthur Agatston's "*The South Beach Diet*."

It is important to note that for *Dr. Atkins' New Diet Revolution* and *The South Beach Diet* books, similar rankings may appear since the books were published in different formats, paperback and hardcover respectively. Because of this difference, the two books appear on different bestseller lists, which accounts for why both books appear in the top bestseller position during the same week. It is also important to note that *The New York Times* publishes several different topical bestseller lists, although the list that both the Atkins and South Beach diet books appear on is the "advise" bestseller list for either paperback or hardcover editions, respectively.

***Publishers Weekly* Bestseller Lists**

According to the Scripps Howard News Service, *Publishers Weekly* bestseller lists are compiled from data from large-city bookstores, bookstore chains and local best-seller lists across the United States. *Publisher's Weekly* provides over 10 "bestseller" lists, including: hardcover fiction and nonfiction; trade and mass market paperback; audio fiction and nonfiction; children's picture books, fiction, and series; religion hardcover and paperback; and books most borrowed for both fiction and nonfiction.

Data Collection

Data from book rankings as published by *Publisher's Weekly* were compiled through the Factiva database by using a keyword search to obtain all bestseller lists published from January 1996 through December 2004. Information was collected for all diet books appearing on the bestseller list during the selected time period, with an emphasis on Dr. Robert Atkins' "*Atkins' New Diet Revolution*" (see Table A.3 in

Appendix A) and Dr. Arthur Agatston's "*The South Beach Diet*" (see Table A.4 in Appendix A).

Although *Publishers Weekly* maintains over ten bestseller lists on the company website, the two sets of lists considered in this data collection differentiated books by type of cover and fiction or non-fiction. Therefore, rankings on the Publisher's Weekly paperback bestseller list for "Dr. Atkins Diet Revolution" are compared to sales for all other paperback titles and rankings for "*The South Beach Diet*" book are compared to all other hardcover non-fiction titles.

Additional Data Collection

Variables that will be considered for analysis in Chapter 5 include: purchases (PCGal), price (RP), gross rating point (GRP), field staff, and personal disposable income (PDINC). Summary tables for the national and regional data collection for these variables are in Appendix A, Tables A.5 and A.6, respectively. Each table displays the values for each variable per four-week period. Specific details of each data set are provided in the following subsections.

Purchases (Variable: PCGal)

Orange juice scanner data were collected from ACNielsen to represent purchases made within the United States and within the U.S. southern region. These data represent four-week periods beginning with the period ending on October 7, 1995 and include purchases made of 100% orange juice at most major outlets, including drug stores, mass merchandisers (i.e., Wal-Mart, Target, etc), and grocery stores with retail sales of two million dollars or more. Total expenditures and gallons purchased reflect all forms of 100% orange juice and includes reconstituted, not-from-concentrate, and frozen concentrate.

Gallons purchased will be based upon scanner data collected as described in the previous paragraph and placed on a per capita basis using population data collected by the U.S. Census Bureau. Gallons purchased per capita will be used in order to isolate the changes in individual purchases overtime as compared to total purchases overtime. Per capita purchase data for the United States and southern region purchases are displayed in Appendix B, Tables B.1 and B.2, respectively.

Limitations of Purchase Data

According to the Florida Department of Citrus, the ACNielsen purchase estimates indicate volume sales in all ACNielsen retail outlets, which includes U.S. grocery store chains with sales greater than \$2 million, Wal-Mart stores (excluding Sam's Club), and mass merchandisers and drug stores with sales greater than \$1 million. Hence, this data set does not include all consumer purchases, most notably consumer purchases at food service outlets (e.g., McDonalds, etc), smaller grocery retail chains and convenience stores.

A second data limitation regards how estimated consumption for a season is calculated. Some of the estimates used by the Florida Department of Citrus are represented as the sum of Florida production, other U.S. production, and U.S. imports minus the sum of U.S. exports, season beginning Florida inventory, and season ending Florida inventory. When considering the potential for measurement error, it is expected that Florida production and inventories and U.S. imports and exports are expected to be measured with little error. The error, however, in measurement becomes an issue when and how other U.S. state-by-state production is calculated, resulting in possible error in measurement which may be traced to the differences between actual and average yields. In addition, non-Florida, U.S. inventories are excluded from these estimates because of

missing data, which may at times result in more significant errors in presumed consumption.

When averaging estimated consumption over a few years, however, the magnitude of these errors may decrease to the extent that net non-Florida inventories (beginning minus ending inventories) average near zero over the period in question.

Although the issue as to which source should be used for determining estimated consumption still exists within the Florida citrus industry, for the purposes of this research, purchase data collected by ACNielsen in the form of purchase scanner data collected from outlets, as described in the previous section, are used for a proxy of consumer purchases of orange juice.

Price (Variable: RP)

For the purposes of this research, retail prices are estimated by computing a weighted average based upon individual expenditures and purchases for each form of 100% orange juice (Equation 3.1), where the weight is defined by market share for each product form. This is to account for the shift in purchasing preferences from frozen concentrated and reconstituted products to not-from-concentrate products. To adjust for inflation, the calculated weighted price was transformed by deflating it by the Consumer Price Index (Base Year = 1984). National and southern region quantity purchased and purchase price for each product form are displayed in Appendix B, Tables B.3 and B.4, respectively. To simplify the assumptions for this study, it is assumed that the popularity of the low-carbohydrate diet will affect all product forms equally.

$$P_t' = ((Q1_o * P1_t) + (Q2_o * P2_t) + (Q3_o * P3_t) + (Q4_o * P4_t)) / (Q1_o + Q2_o + Q3_o + Q4_o) \quad (3.1)$$

Where, Q1 is the quantity of Frozen Concentrated Orange Juice, per period,
 P1 is the price for Frozen Concentrated Orange Juice, per gallon,
 Q2 is the quantity of Not-from-Concentrate Orange Juice, per period,
 P2 is the price for Not-from-Concentrate Orange Juice, per gallon,
 Q3 is the quantity of Reconstituted Orange Juice, per period,
 P3 is the price for Reconstituted Concentrated Orange Juice, per gallon,
 Q4 is the quantity purchased for Shelf Stable Orange Juice per period, and
 P4 is the price for Shelf Stable Orange Juice per period.

Gross Rating Point (Variable: GRP)

According to a Nielsen Media Research glossary, the Gross Rating Point (GRP) is a unit of measurement of audience size. It is used to measure the exposure to one or more programs or commercials, without regard to multiple exposures of the same advertising to individuals. See Table A.5 and A.6 for values of estimated GRP's for orange juice promotions and advertisements during the period of study.

This information was included in the regression analysis to help further explain changes in orange juice purchases that might be attributed to television and radio programs or commercials paid for by the Florida Department of Citrus.

Field Staff (Variable: FieldStaff)

The Florida Department of Citrus field staff who worked with retailers and food service providers to promote Florida citrus and helped retailers in the areas of merchandising, in-store promotions, as well as with category management such as allocating shelf space. They also helped coordinate Florida Department of Citrus generic advertising with retailer promotions. Since March 2001, the field staff has largely been eliminated. In this analysis, the existence of field staff will be represented by a dummy variable. The variable will have a value equal to 1 for October 1995 through February 2001 and a value equal to 0 for March 2001 through January 2005.

Personal Disposable Income (Variable PCINC)

Personal disposable income is monthly income less taxes and was obtained from the U.S. Department of Commerce Bureau of Economic Analysis by the Florida Department of Citrus. Since orange juice is not considered a necessity item, it is assumed that purchases of orange juice are paid for with a household's disposable income. In order to account for inflation, aggregate personal disposable income was first deflated by the Consumer Price Index (Base Year = 1984) and then placed on a per capita basis by dividing by population (U.S. and southern region, respectively) as reported by the U.S. Census Bureau. Table B.1 and B.2 list the values of this variable for both the U.S. and the Southern region.

This information was useful in the regression analysis to help further explain changes in orange juice purchases that might be attributed to changes in disposable household income, especially since disposable household income has increased over time.

CHAPTER 4 LIFE CYCLE HYPOTHESIS

One hypothesis identified for this research project was to determine whether or not dieting trends occur in cycles, such that they follow a cyclical pattern similar to the product life-cycle theory. To test this hypothesis, the Product Life Cycle theory is applied to the data collected for orange juice per capita purchases (both regional and national) and the data collected during the content analysis of national and regional newspaper and/or magazine articles and the book rankings for “*Atkins’ New Diet Revolution*” and “*The South Beach Diet*” books as reported by *The New York Times* and *Publisher’s Weekly*.

Product Life Cycle Theory

As discussed in Chapter 2, Lilien and Kotler (1983) state that the product life cycle model (PLCM) was developed originally to study the sales and profit patterns over time of branded products. According to Johnson (2002), the PLCM can be divided into four stages: introduction, growth, maturity, and decline and that these product life cycle stages vary in length.

Blank (2002) argues that although the model was developed originally to look at specific products or product lines, it can be extended to firms and to industries. He modified the PLCM for use in analyzing the U.S. agriculture industry with regards to economic performance overtime.

Diet Life Cycle

Hypothesis 1 stated, “Dieting trends occur in cycles, such that they follow a cyclical pattern similar to the product life-cycle theory.” In order to determine whether or not dieting trends follow a pattern similar to the PLCM, the frequency of articles and rankings of book popularity will be graphed. To determine the existence of a life cycle curve, the following parameters are used to define the phases of the life cycle for diet-related information in newspapers and magazines.

The introduction phase will be characterized by little to minimum number of articles printed each four-week period. As the frequency of articles increases, the life cycle will shift into the growth phase, which will be characterized by the increasing frequency at an increasing rate of topically-related articles for the given time period. As the inflection point is reached where frequency of articles is still increasing but now at a decreasing rate, the maturity phase begins and continues until the frequency of articles per period peaks. This will then lead to the decline phase, in which the frequency of articles printed each four-week period decreases to a frequency either equal to or less than the beginning of the introduction phase.

Like most trends and fads, determining how to measure or track the life cycle of a diet is a challenge since a dieting trend may impact many different components of society and may be associated with both negative and positive impacts upon various industries. The impact of a dieting trend upon an industry seems evident considering the most recent low-carbohydrate dieting trend.

Diet trends in general capture public attention through print (media, books, etc) and by word of mouth, which seems especially true considering the recent low-carbohydrate trend. MacInnis, et al (1991) defined health motivation as the consumer’s willingness to

perform and interest in performing said health behaviors, such as dieting and weight reduction. Therefore, willingness to adjust health behaviors due to diet media coverage found in books and newspaper or magazine articles relating to the low-carbohydrate dieting trend may be a proxy for the effect of diet media coverage upon a particular industry. In addition, Moorman and Matulich's (1993) research discovered that health motivation increases the amount of diet information acquired from media sources but not information acquired from casual sources, such as friends and family. Therefore, this research project involves defining diet media coverage as that which is obtained from media articles and books.

Source of Diet Information: Newspapers and Magazines

As described in Chapter 3, media articles were collected electronically by using journal databases available through the University of Florida library system. Articles selected were related to the general topic of low-carbohydrate diets, the Atkins diet, or *The South Beach Diet*. As elaborated in Chapter 3, a total of 667 articles published from October 1995 through December 2004 were collected for the United States and the southern region, from magazine and newspaper sources. Articles were coded by date and separated according to four-week periods (13 periods, annually), which corresponded with the available data set on the consumer purchases of orange juice.

Of the total articles collected (U.S. and Southern region), 76.1% were printed from November 2002 through December 2004. The two four-week periods corresponding with January and February 2004 boasted the largest number of topically-related articles, accounting for 13.6% of the total articles collected. On average, 5.5 articles topically-relating to low-carbohydrate diets, the Atkins diet, or South Beach diet were printed per

four-week period, although there are some 4-week periods when no articles were collected.

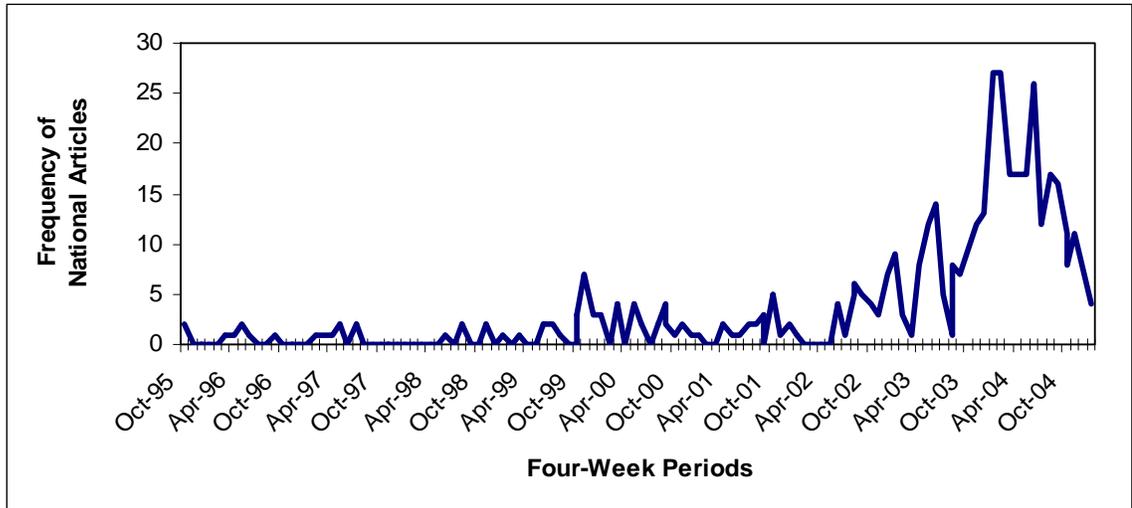


Figure 4.1: Total Media Articles (January 1995 through December 2004)

For those articles collected from national newspaper and magazine sources, a total of 444 topically-related articles were found, with an average of 3.6 articles per four week period. As indicated in Figure 4.1, a high concentration of articles (74.3%) were published in national newspapers and magazines from November 2002 through December 2004 and the two four-week periods with the highest frequency of articles were January and February 2004 (12.2% of the total articles collected). In relation to Hypothesis 1, the graph of total media articles does appear to indicate the presence of a crude approximation of a life cycle curve. This may also serve as an indication of a diet life cycle if the frequency of national newspaper and magazine articles are an appropriate proxy for measuring the popularity of a dieting trend by actual dieting consumers.

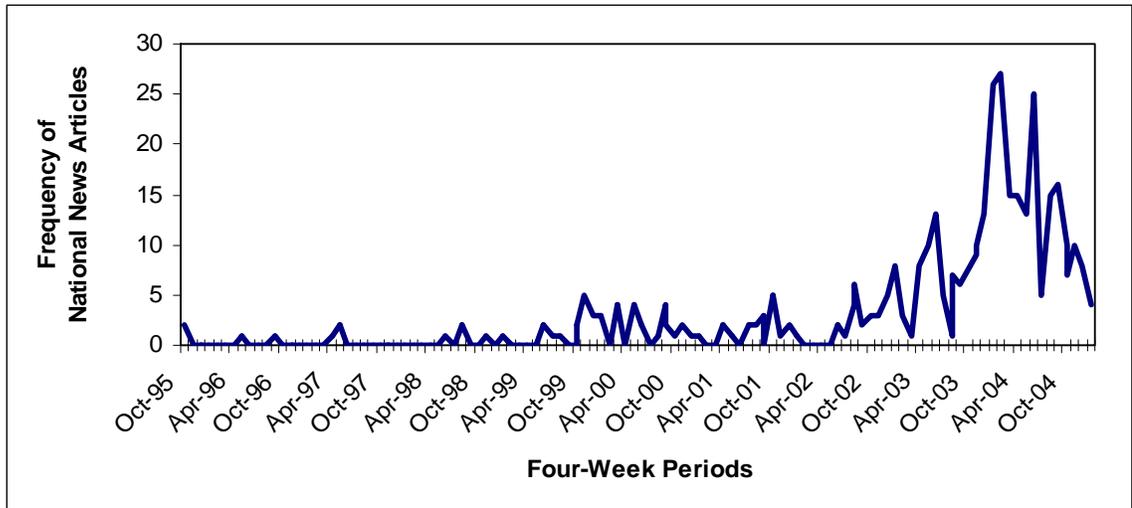


Figure 4.2: National Newspaper Articles (October 1995 through December 2004)

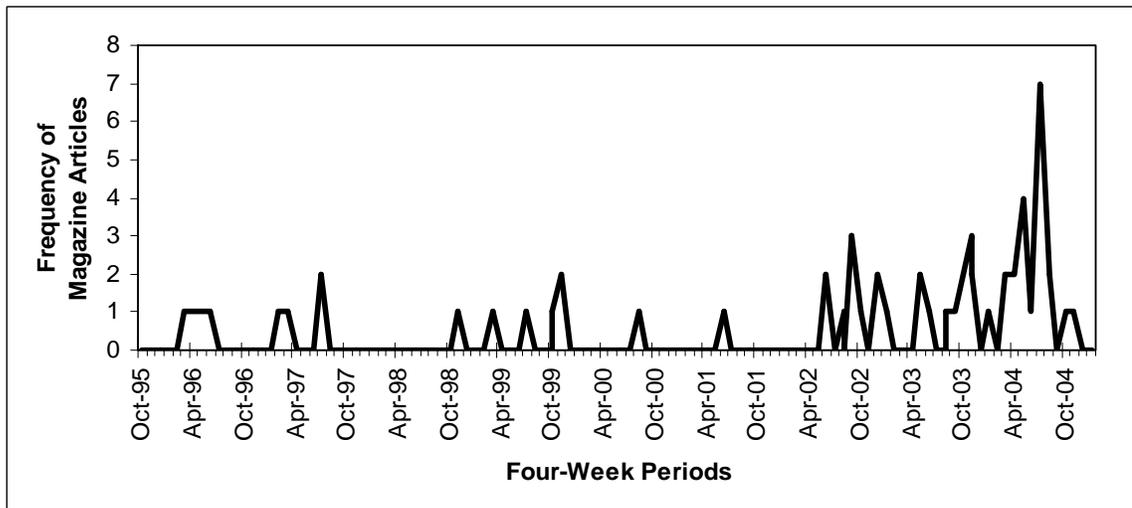


Figure 4.3: National Magazine Articles (October 1995 through December 2004)

Of the total articles collected from U.S. media sources, 386 articles were collected from national newspaper sources and 58 from national magazine sources. As indicated in Figure 4.2, high concentrations of newspaper articles (76.4%) were printed from November 2002 through December 2004 and the two four-week periods corresponding with the highest frequency of articles (13.8%) occurred during January and February 2004.

The frequency of national newspaper articles over time also appears to follow a crude approximation of a life cycle curve, as described in the previous section. Considering the four general phases of a life cycle, it appears that the introduction phase of the cycle is the longest in duration and occurs from October 1996 through June 2002, followed by the growth phase, which appears to occur from July 2002 through December 2004. The maturity phase, which concludes in the four-week period in which the number of articles printed per period reaches the maximum frequency, occurs from January through June 2004. Finally, the decline phase occurs from July 2004 through January 2005 (see Table A.1 in Appendix A for frequency of diet media coverage collected from national newspapers and magazines).

As indicated in Figure 4.3, a high concentration of articles collected from national magazines (60.34%) were printed from November 2002-December 2004, 16.1% less than the percentage of articles published by national newspapers during the same time period. Since magazine articles were printed on a monthly to bimonthly basis, it is not surprising to note that an average of 0.5 articles was printed each four-week period. Also indicated in Figure 4.2, the two four-week periods corresponding with the highest frequency of magazine articles collected (15.6% of total) occurred during July and August 2004. This is a difference of five months when compared to the two month period with the highest frequency of both total news articles and national newspaper articles collected.

Similar to the trends of national newspaper articles, the trend of national magazine articles also appears to follow an introduction, growth, maturity, and decline, although the phases do not occur during the same time periods. The introduction phase for diet media coverage as collected from national magazine articles occurs from October 1995

through July 2003 and is 13 periods longer than the introduction phase for national newspaper articles. The growth phase is also similar to that of the diet media coverage collected from national newspapers and occurs from August 2003 through January 2004. This is followed by the maturity phase, which occurs during the two four-week periods corresponding with July and August 2004, which is shorter in duration when compared with the maturity phase of national newspaper articles. Lastly, the decline phase for diet media coverage as collected from national magazines occurs from September 2004 through January 2005.

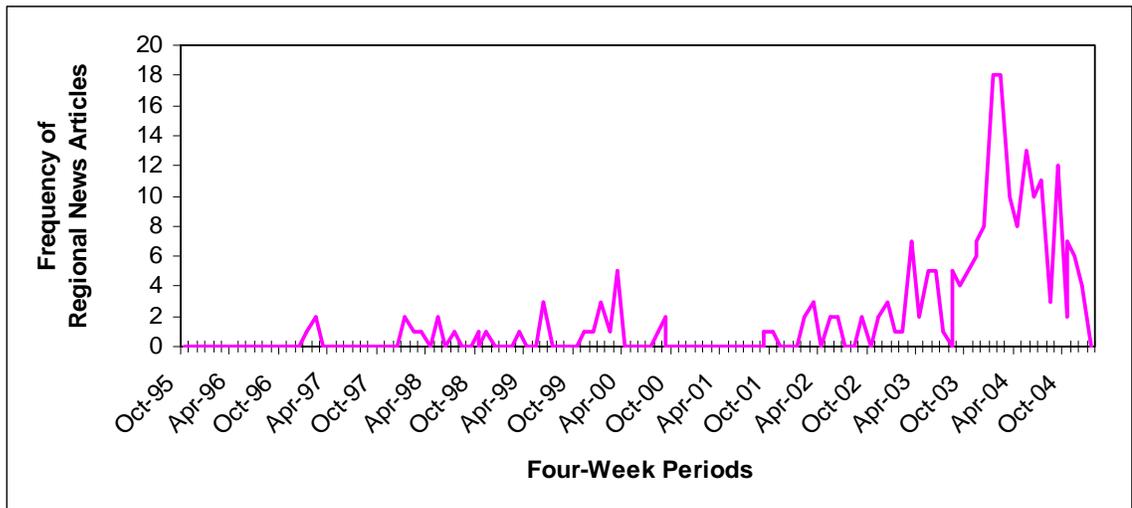


Figure 4.4: Regional Newspaper Articles (January 1995 through December 2004)

As indicated in Figure 4.4, of the 223 articles collected from Southern region newspaper sources, a high concentration (79.7%) of articles were printed from November 2002-December 2004, which is 3.3% more than the number of national news articles printed during the same period. Additionally, Figure 4.4 shows that the two four-week periods in which the highest frequency of regional newspaper articles (13.8%) occurred during January and February 2004. This is the same two month period with the highest frequency of news articles collected from national newspaper sources.

The frequency of articles collected from southern region newspapers also appears to follow a trend similar to that displayed in Figure 4.2 for national newspapers. The introduction phase for diet media coverage collected from southern region newspapers occurs from October 1995 through August 2003, 21 periods longer than the introduction phase for national newspaper articles. The growth phase follows and appears to occur from March 2003 through December 2004, representing eight four-week period which is shorter in duration than the growth phase for diet media coverage collected from national newspaper articles. However, this phase does terminate for both sets of data during the same four-week period (December 2004). The maturity phase for diet media coverage collected from regional newspapers appears to occur from January and September 2004, which concludes two months later than the maturity phase for national newspaper articles, but only one month later than the maturity phase for national magazine articles. Finally, the decline phase occurs from October 2004 through January 2005 (see Table A.2 for frequency of regional news articles collected for each four-week period).

Source of Diet Information: Diet Books

A second source of diet information is diet books. These books are generally written by an individual or group of individuals recognized as doctors of medicine or health experts, such as Dr. Robert Atkins, author of “Atkins New Diet Revolution” (published in 1992) and Dr. Arthur Agatston, author of “*The South Beach Diet*” (published in 2003).

Because book sale information is not considered public information, a second best proxy for book popularity, and perhaps diet popularity, are book bestseller status as determined by national bestseller lists. The most recognized bestseller list is the list published by *The New York Times*. Although it is the most recognized and represents

over 4,000 bookstores plus wholesalers serving 50,000 other retailers, this bestseller list might not be the best proxy for book popularity, since rankings are collected based on a list of pre-selected potential bestsellers compiled by *The New York Times*, which is then ranked according to sales by bookstores and warehouses. Additionally, books are ranked by type of book and therefore rankings might not account for the popularity of the diet book as compared to other fiction and non-fiction best sellers. For *The New York Times* Bestseller List, books about diets and weight loss are generally ranked on the “advise, how-to, and miscellaneous” bestseller list.

A second bestseller list, published by *Publishers Weekly*, may serve as a better proxy of book popularity, since book rankings are compiled using sales rankings submitted by large-city bookstores, bookstore chains and local best-seller lists across the United States. Additionally, books ranked by *Publishers Weekly* are only separated by the type of binding used, hardcover or paper back, and whether the book is classified as fiction or non-fiction. Therefore, rankings on the Publisher’s Weekly paperback bestseller list for “Dr. Atkins Diet Revolution” are compared to sales for all other paperback non-fiction titles and rankings for “*The South Beach Diet*” book are compared to all other hardcover non-fiction titles. For these reasons, the weekly bestselling rankings reported by Publisher’s Weekly are used as the primary proxy of diet popularity with regards to diet books as sources for diet information.

Atkins New Diet Revolution

As previously noted, Dr. Robert Atkins first published his low-carbohydrate diet in 1972. In 1992, Atkins’ republished his low-carbohydrate diet plan under the title, “*Atkins’ New Diet Revolution.*” Since 1996 this book has become a bestseller and has led

a new generation of dieters on the quest to reduce weight by reducing carbohydrate intake and increasing protein and fat intake.

Using the rankings published by *Publishers Weekly* to proxy book (and perhaps diet) popularity, it appears that popularity for the low-carbohydrate diet was bimodal, indicating that the popularity of the low-carbohydrate diet as influenced by Atkins' diet book occurred twice, from December 1996 through December 2000 and again from December 2001 through December 2003.

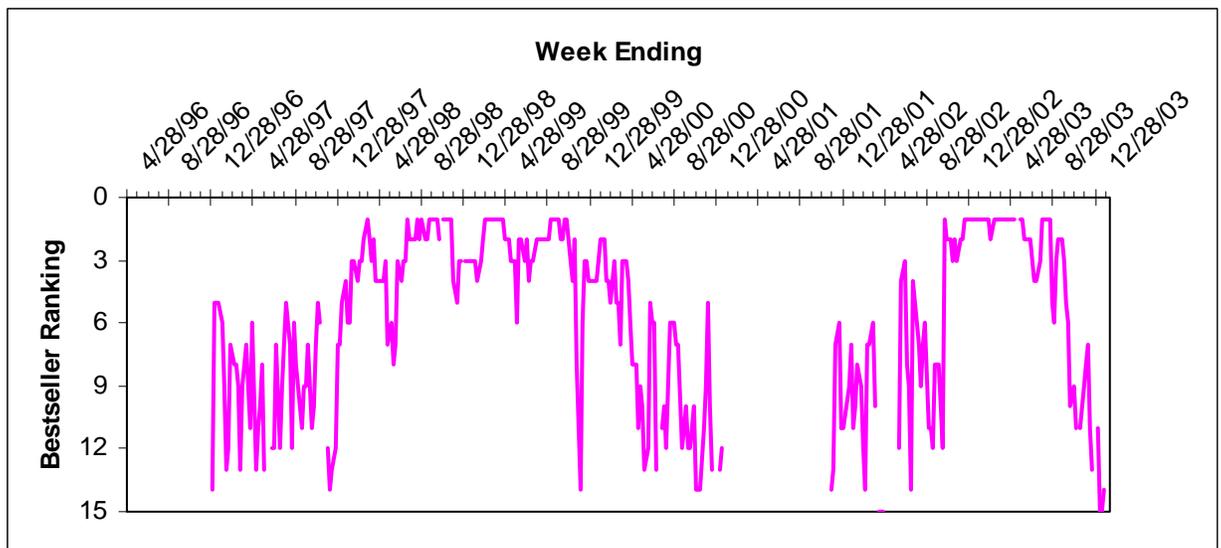


Figure 4.5: *Atkins' New Diet Revolution* Weekly Rankings, *Publishers Weekly* Bestseller List (April 28, 1996 through December 28, 2003)

According to the Publisher's Weekly bestseller list (Figure 4.5), Atkins' book did not achieve the top bestseller status until March 1998, 60 weeks after first appearing on the bestseller list and then fell from the bestseller list 58 weeks after being ranked in the top bestseller position for eight weeks from February 28, 1999 through April 18, 1999. For the second rise in book popularity, achieving top bestseller status took only 40 weeks, 20 less than before. The decline in book popularity also occurred over the span of several weeks, falling from the bestseller list 21 weeks after being ranked the top non-fiction

bestseller position for 23 weeks from December 15, 2002 through May 11, 2003. After January 2004, the Atkins' book was no longer ranked in the top 15 of the *Publishers Weekly* Bestseller Lists.

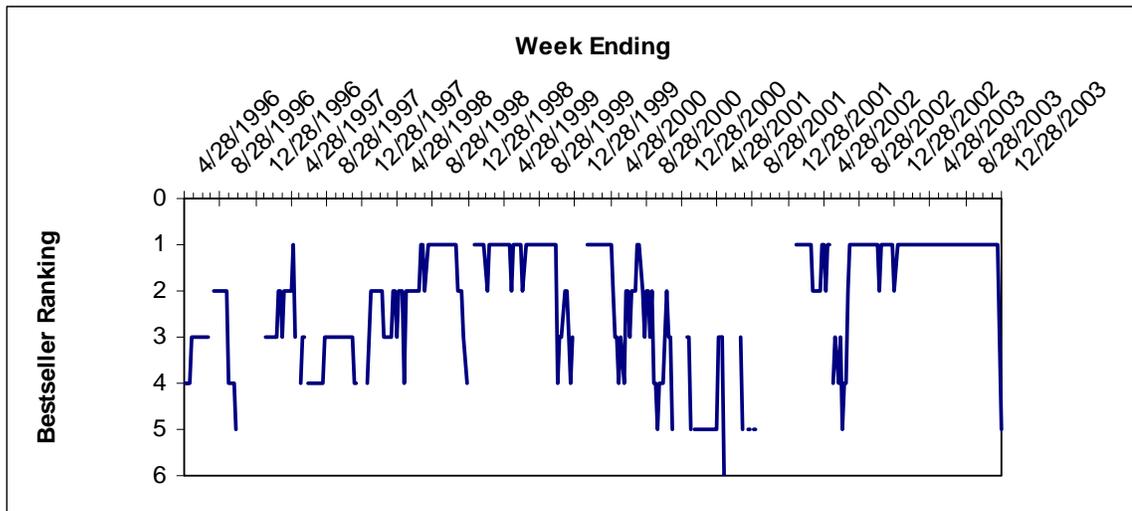


Figure 4.6: *Atkins' New Diet Revolution* Weekly Rankings, *New York Times* (April 28, 1996 through December 28, 2003)

Rankings for Atkins' diet book on *The New York Times* Bestseller List (see Figure 4.6), while following a similar pattern as the *Publisher's Weekly* bestseller list, does not form as uniform of a pattern. According to this list, Atkins' diet book first appeared on the bestseller list in April 1996, eight months prior to the book's first appearance on the *Publisher's Weekly* bestseller list. It is also interesting to note that Atkins' diet book was ranked in *The New York Times* top bestseller position throughout most of 1999, with the exception of weeks during which holidays such as Valentine's Day, Mother's Day, and Father's Day occurred. During those weeks, books from the popular series, "Chicken Soup for the Soul" were ranked in the top bestseller position. After February 2004, the Atkins book was no longer ranked on *The New York Times* Bestseller Lists.

Given the slow rise and decline in popularity for Atkins' diet book as indicated by the *Publishers Weekly* data, it appears that the book's popularity increased due to

cascades of tiny, endogenous shocks, such as casual recommendations (friends and family). Sornette, et al (2004) indicate that such books also descend the rankings more slowly than those propelled by exogenous shocks, which also appears true given the information displayed in Figures 4.5 and 4.6. Since endogenous shocks are primarily from casual recommendations, it is not possible to determine whether or not these shocks did occur and influence book popularity.

It is also possible that exogenous shocks occasionally caused other books to be ranked above Atkins' diet book, but because of the nature of these shocks, Atkins' book was able to repeatedly re-emerge as the top ranked book for an extended period of time. This type of interaction might explain some of the variability in the "life-cycle" curves, displayed in Figures 4.5 and 4.6.

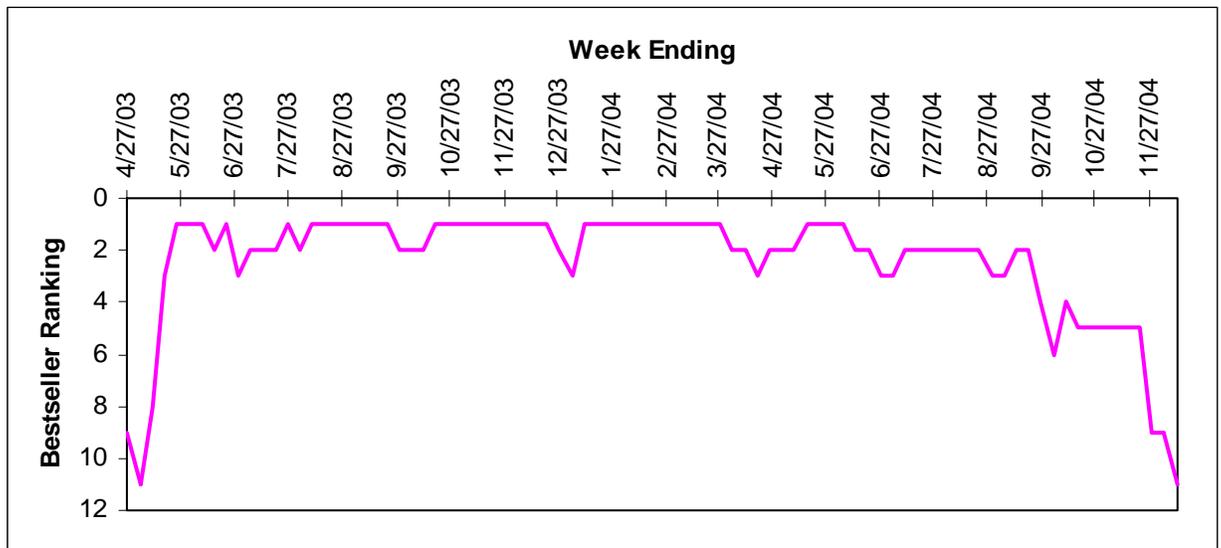


Figure 4.7: *The South Beach Diet* Weekly Rankings, *Publishers Weekly* (April 27, 2003 through December 12, 2004)

Publisher's Weekly bestseller rankings for Dr. Agatston's "South Beach Diet" book are shown in Figure 4.7. Using these rankings to proxy book (and perhaps diet) popularity, it appears that popularity for *The South Beach Diet* book also follows a curve

reminiscent of the product life cycle curve. Book popularity rose to the top bestseller position only four weeks after first appearing on the bestseller list in April 2003, the same month the book was published. The book began its descent from the list only 27 weeks after having been ranked at the top of the list for 54 weeks.

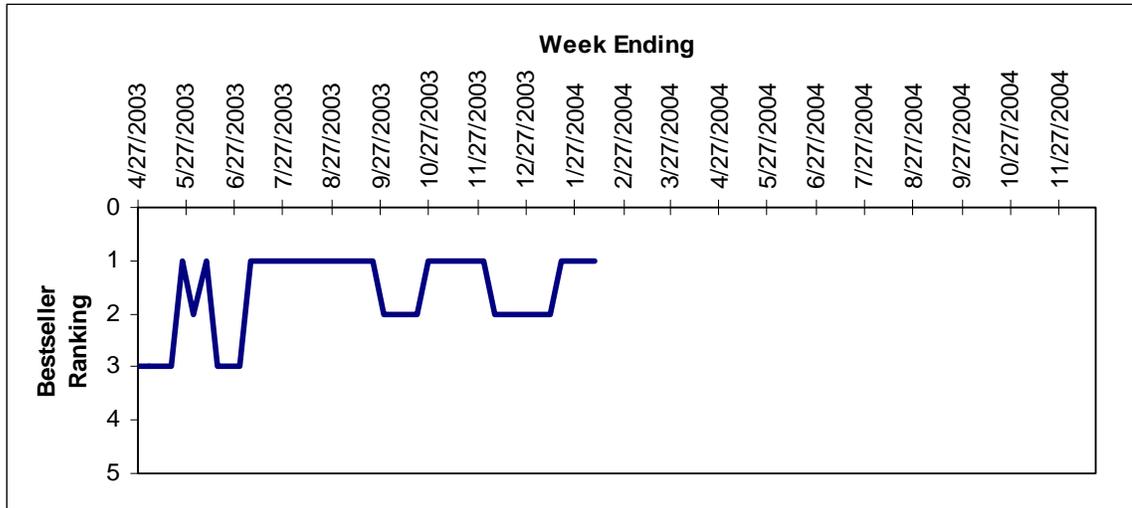


Figure 4.8: *The South Beach Diet* Weekly Rankings, New York Times (April 27, 2003 through December 19, 2004)

Weekly bestseller rankings assigned for Agatston's diet book by *The New York Times* are displayed in Figure 4.8. These rankings do not seem to follow a pattern similar to the rankings from *Publisher's Weekly*, with the exception that the book did rise and decline quickly from the bestseller list. According to *The New York Times* bestseller list, the book first reached the top of the bestseller list in May 2003, four weeks after publication release and having first appeared on the bestseller list. The book remained a New York Times bestseller from July 2003 through September 2003, October through November 2003, and from January through February 2004. However, rather than declining in the bestseller rankings, the "South Beach Diet" book immediately fell from the top bestseller position and permanently off the bestseller list in February 2004.

Given the abrupt rise and decline in popularity for Agatston's diet book, it seems that the book's popularity increased due to exogenous shocks described by Sornette, et al as a major media announcement, a celebrity endorsement, or a dignitary's death. Horovitz (2004) did note that *The South Beach Diet* was endorsed by celebrities such as Bette Midler, Nicole Kidman and former President Bill Clinton. Sornette, et al indicated that book popularity motivated by exogenous shocks experience an instant rise in sales is followed by a fairly quick decline, which appears to be the case in Figures 4.6 and 4.7.

Conclusions

The hypothesis was that dieting trends occur in cycles. For this study, an attempt to determine whether or not a diet life cycle exists was tested by examining the prevalence of diet information as found in newspapers, magazines, and books. The graphs of trends representing the frequency of newspaper and magazine articles and book popularity, however, do not strongly support the hypothesis that dieting trends occur in cycles. The evidence, as presented, is inconclusive and the hypothesis need not be rejected, since some observations about bestseller rankings, newspaper and magazine articles hint at cyclical patterns. This result may be due in part to the time period length selected for the study.

This conclusion suggests the need for further research on whether diets do or do not occur in cycles, and on what information relating to diets does or does not define the life cycle of a diet. Further analysis of additional newspaper and magazine sources or other sources of diet media coverage may better define the life cycle of a diet, and be more accurate measures of this phenomenon.

CHAPTER 5 DIET MEDIA COVERAGE AND PURCHASES HYPOTHESIS

The main purpose of this chapter is test the hypothesis that diet trends have impacted the purchases of orange juice. In the first section of this chapter, trends in diet media coverage and purchases of orange juice are investigated. In the second section a demand equation for orange juice in the United States is estimated, taking into consideration the effect that diet media coverage, specifically low-carbohydrate diet media coverage, has had upon per capita purchases of 100% orange juice.

Trends in Diet Media Coverage and Per Capita Purchases of Orange Juice

To compare trends in diet media coverage and per capita purchases of orange juice, data were represented as cumulative totals for each year included in the study.

U.S. Diet Media Coverage and Orange Juice Purchases

Figure 5.1 represents the annual cumulative U.S. per capita purchases of orange juice and diet media coverage in national newspapers from 1996 through 2004. When orange juice purchases decreased from 3.12 gallons per capita in 1998 to 3.05 gallons, the number of newspaper articles topically related to low-carbohydrate diets increased from 4 to 15 articles, respectively. A similar trend occurred from 2000 through 2004; annual per capita orange juice purchases decreased by 12.3% while newspaper articles about low-carbohydrate diets increased by 700%. This indicates that decreases in U.S. orange juice purchases are negatively correlated with increases in diet media coverage relating to low-carbohydrate diets as printed in U.S. newspapers. Yet to be proven is whether this correlation is spurious or causal.

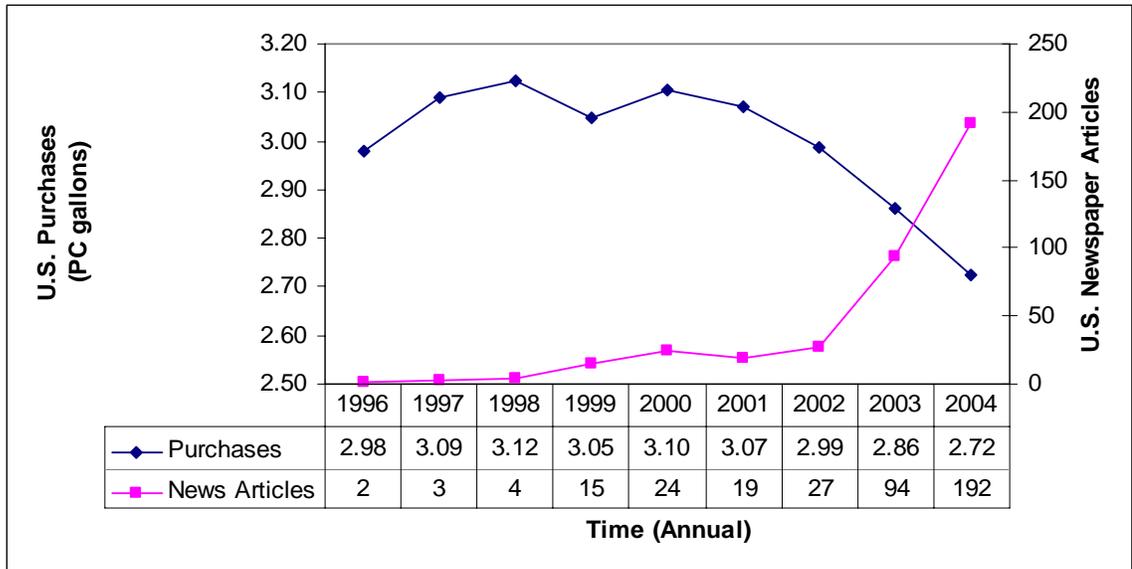


Figure 5.1: U.S. Per Capita Orange Juice Purchases and Newspaper Articles on Low-Carbohydrate Diets and Dieting, Annual (1996 through 2004)

Annual totals of U.S. per capita orange juice purchases and frequency of national magazine articles from 1996 through 2004 are displayed in Figure 5.2. U.S. per capita purchases of orange juice began declining in 2000, a year when there was only one magazine article identified in the database. As per capita purchases of orange juice continued to decrease (12.3% by 2004), the frequency of magazine articles continued to increase, resulting in a total of 22 magazine articles in 2004. The information displayed in Figure 5.2 indicates that decreases of U.S. orange juice purchases negatively correlate with increases in diet media coverage about low-carbohydrate diets in national magazines. Again, the potential causality (i.e., articles led to decreased purchases) can not be proven, but the correlation suggests that this is possible.

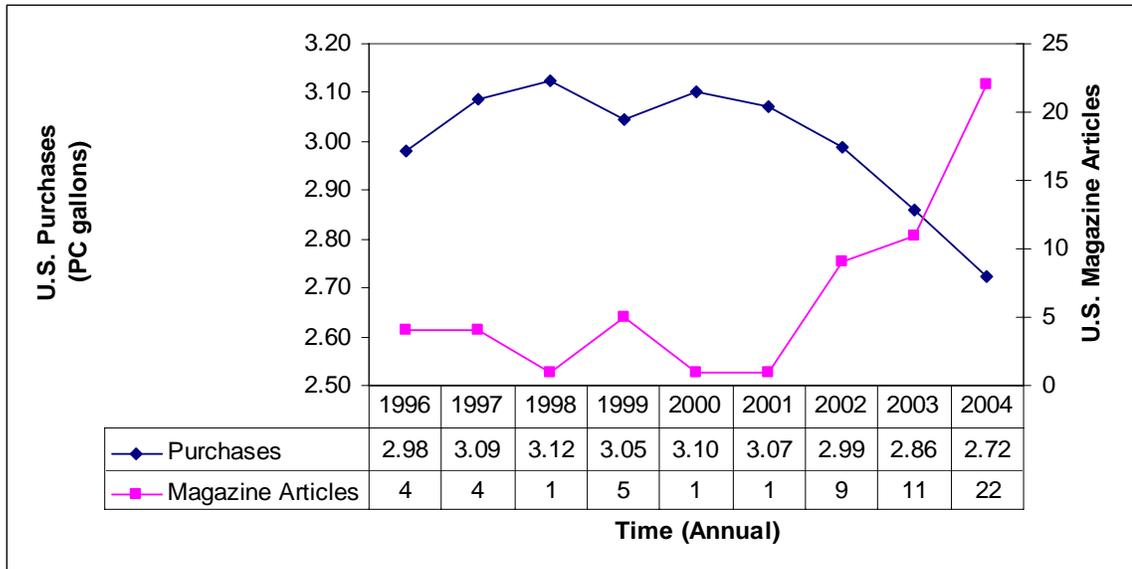


Figure 5.2: U.S. Per Capita Orange Juice Purchases and Magazine Articles on Low-Carbohydrate Diets and Dieting, Annual (1996 through 2004)

Southern Region Diet Media Coverage and Orange Juice Purchases

The information displayed in Figure 5.3 represents the annual cumulative Southern region per capita purchases of orange juice and newspaper articles found from 1997 through 2004. Similar to the comparison of U.S. per capita orange juice purchases and newspaper articles, Southern region per capita purchases of orange juice began declining in 2001. From 2001 through 2004, regional orange juice purchases decreased by 30.20% and regional diet coverage in newspapers increased from 2 articles in all of 2001 to 122 articles in all of 2004. This indicates that decreases in Southern region orange juice purchases are negatively correlated with diet media coverage by regional newspapers, and that there may be a direct causal link between the two trends.

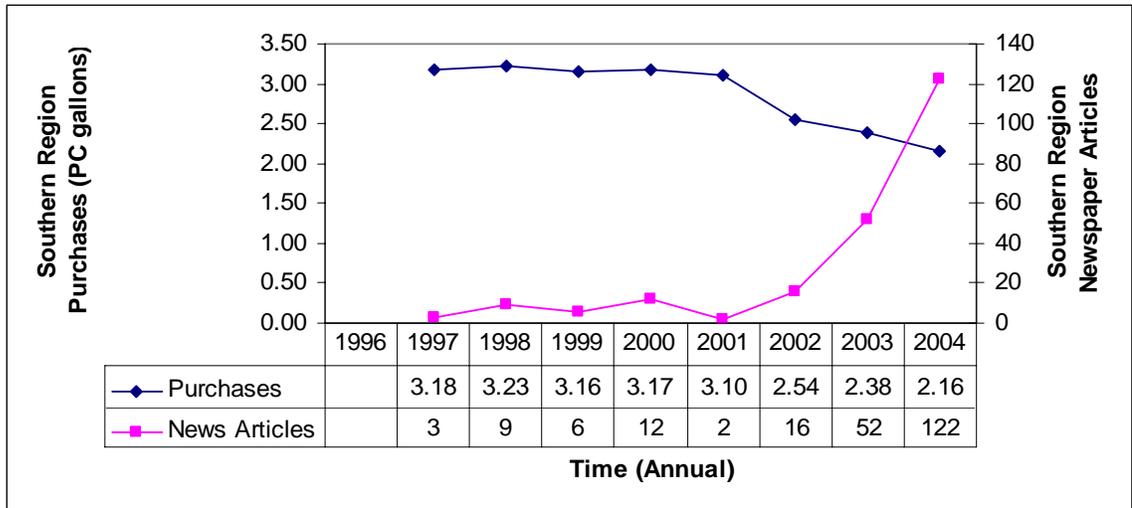


Figure 5.3: Southern Region Orange Juice Purchases and Newspaper Articles, Annual (1997 through 2004).

The Base Model, U.S. Orange Juice Demand

In order to estimate demand for orange juice by incorporating a diet media coverage variable, variables that may also be necessary to explain variations in per capita purchases of orange juice must first be considered. As discussed in Chapter 3, the explanatory variables include in the base model are price, gross rating point, field staff, and per capita disposable income. In order to incorporate the effect of diet media coverage, a diet variable will be constructed and defined by the frequency of diet coverage in newspapers and magazines within each four-week period.

The United States retail purchases of orange juice data is the proxy used for the model's dependent variable, U.S. consumer demand for orange juice. The demand of orange juice is expressed as:

$$D = f(\text{RP}, \text{DC}_1, \text{DC}_2, \text{GRP}, \text{ST}, \text{PCINC}, \text{P2} \dots \text{P13}) \quad 5.1$$

Where RP is the real weighted price per gallon of orange juice, DC₁ is diet media coverage collected from national newspapers, DC₂ is diet media coverage collected from national magazines, ST is a dummy variable representing the existence of FDOC field staff,

PCINC is personal disposable income on a per capita basis, and P2 through P13 are seasonal dummy variables representing the 13 four-week periods annually, with the first four weeks of January as the base reference for P2 through P13.

Real weighted price is included, since the model is being used to estimate consumer demand for orange juice and typically price is an explanatory variable included in demand equations. The weighted price, however, is used to account for the differences in price and market share across the four orange juice product forms: Reconstituted, Not-from-Concentrate, Frozen Concentrate, and Shelf Stable.

Diet media coverage is split between two variables, representing the frequency of articles representing diet coverage for newspapers and magazines, respectively. These explanatory variables are included to determine whether such information has an effect upon per capita orange juice purchases and to test the second hypothesis.

GRP represents the number of Gross Rating Points, which is a measurement of exposure to one or more media programs or commercials. This explanatory variable was included to determine whether information about orange juice portrayed through television and radio programs or commercials has an effect upon per capita purchases and explains some variation in the dependent variable.

The dummy variable for field staff represents the existence of field staff as funded by the Florida Department of Citrus (FDOC). Field staff helped retailers in the area of merchandising, in-store promotions, and category management in addition to coordinating FDOC generic advertising with in-store promotions. The field staff was largely eliminated in March 2001 and their existence or non-existence may explain some variation in the purchases of orange juice.

As mentioned in Chapter 3, orange juice is not considered an item of necessity and purchases are therefore assumed to be taken from a household's discretionary income. Given that household income is a factor for determining consumers most likely to purchase orange juice, changes in per capita discretionary income may explain some variation in the purchases of orange juice.

Empirical Results, Steps Taken to Determine Best Base Model of Orange Juice Demand

The demand equation was expressed in per capita terms and followed a linear functional form. The resulting model explained over 91% of the variation in retail purchases. When the Durbin-Watson test was used to test for autocorrelation, however, the statistic indicated that the residuals from the base model had significant positive autocorrelation ($DW=0.417$, $DW_L= 1.38190$, $DW_U=2.04892$).

The first step taken to correct for the presence of significant positive autocorrelation was to remove the insignificant variables from the base model (gross rating points and magazine diet coverage). The resulting model explained over 91% of the variation in retail purchases. When the Durbin-Watson test was used to test for autocorrelation, however, the statistic indicated that the residuals from the base model had significant positive autocorrelation ($DW=0.41$, $DW_L= 1.38190$, $DW_U=2.04892$).

The next step taken to correct for the continued presence of autocorrelation involved applying the Cochran-Orcutt method. Habit persistence, which allows for the effect of purchases in the previous time period upon current demand for orange juice, was included as a variable in the modified base model (PCGAL1). Additionally, insignificant variables from the base model were removed from the model in order to isolate the

impact of significant explanatory variables upon purchases of orange juice. This modified base model was used in both the U.S. and Southern region analysis.

The Adjusted Base Model, U.S. Orange Juice Demand

The explanatory variables included in the model of U.S. consumer demand for orange juice were: price, newspaper diet media coverage, field staff, per capita disposable income, and per capita purchases of orange juice in the previous period.

The United States retail purchases of orange juice data set from ACNielsen is the proxy used for the model's dependent variable, U.S. consumer demand for orange juice.

The demand of orange juice is expressed as:

$$D_t = f(RP, DC, ST, PCINC, PCGAL_{t-1}, P2...P13) \quad (5.2)$$

Where RP is the real weighted price per gallon of orange juice, DC is national newspaper diet media coverage, ST is a dummy variable representing the existence of FDOC field staff, PCINC is personal disposable income on a per capita basis, PCGAL_{t-1} is the dependent variable (per capita purchases of orange juice) lagged by one period, and P2 through P13 are seasonal dummy variables representing the 13 four-week periods annually, with the first four weeks of January as the base reference for P2 through P13.

Variables are as described in previous sections, with the exception of the explanatory variable representing per capita orange juice purchases from the previous period (PCGAL_{t-1}). This variable is included in the model to represent the likelihood that an individual will not change purchase habits of orange juice from period to period. An exception to this would be when purchase decisions are influenced by some factor, such as diet media coverage, and causes a consumer to not purchase orange juice, although orange juice.

Empirical Results, U.S. Orange Juice Demand

The demand equation was expressed in per capita terms and followed a linear functional form. The resulting model (Table 5.1) explained over 96% of the variation in retail purchases and all the parameters had the expected signs. For the SAS program used to estimate the elasticity, regressions, and correlation analyses, refer to Appendix C1.

Table 5.1: Estimated Model Results of U.S. Per Capita Orange Juice Demand

Variable	Description	Parameter	Std Error	t-Statistic
Intercept		0.115	0.016	7.33
PCGAL1	Dependent Variable (t-1)	0.641	0.053	12.20
RP	Real Price	-0.008	0.001	-5.79
PDINC	Disposable Income	58.502	10.600	5.52
DC	Newspaper Diet Media Coverage	-0.0002	0.0001	-3.14
ST	Field Staff	0.004	0.001	3.60
P2	Period 2 Dummy Variable	-0.019	0.002	-10.24
P3	Period 3 Dummy Variable	-0.009	0.002	-6.45
P4	Period 4 Dummy Variable	-0.018	0.002	-10.39
P5	Period 5 Dummy Variable	-0.016	0.002	-9.79
P6	Period 6 Dummy Variable	-0.016	0.002	-8.14
P7	Period 7 Dummy Variable	-0.016	0.002	-7.40
P8	Period 8 Dummy Variable	-0.012	0.002	-5.00
P9	Period 9 Dummy Variable	-0.008	0.002	-4.41
P10	Period 10 Dummy Variable	-0.008	0.002	-4.45
P11	Period 11 Dummy Variable	-0.011	0.002	-6.48
P12	Period 12 Dummy Variable	-0.008	0.002	-4.77
P13	Period 13 Dummy Variable	-0.006	0.001	-4.32
Total R ²	0.9649			
Regress R ²	0.9649			
Durbin-h	0.5641			
Pr > h	0.2864			

The relationship between per capita purchases and purchases from the previous time period (lagged one period) were positive and significant, returning a coefficient of 0.64 and a t-statistic of 12.20. This indicates that purchases of orange juice are based on habit and consumers who previously purchased orange juice are more likely to purchase

orange juice again than those consumers who have not previously purchased orange juice.

The relationship between purchases and price was negatively related and significant, resulting in a coefficient of -0.008. This indicates that the expected inverse relationship between price and demand exists and that as the price per gallon of orange juice increases, per capita purchases of orange juice decrease.

The relationship between purchases and diet media coverage was negatively related and significant, returning a coefficient of -0.0002. This suggests that as diet media coverage in newspapers topically related to low-carbohydrate diets, including the Atkins' and South Beach diets, increased, purchases of orange juice decreased. Hypothesis 2 stated, "Demand for orange juice is correlated with health-and diet-related information in the media." This coefficient result of -0.0002 and corresponding t-statistic of -3.14 indicates that the hypothesis should not be rejected and that the relationship between purchases of orange juice and diet media coverage is significant.

The relationship between purchases and the dummy variable representing the existence of field staff was positively related and significant. This suggests that the existence of field staff who worked with retailers and food service in promoting Florida citrus and helped retailers in the area of merchandising positively and significantly affected purchases of orange juice. This also suggests that decreases in purchases of orange juice may be due, in part, to the elimination of field staff who aided in promotion and merchandising efforts of orange juice.

The relationship between purchases and disposable per capita income was positively related and significant, returning a coefficient of 58.502. This result

corresponds with research indicating that the consumption of orange juice increases with household income.

Finally, the relationship between the seasonal dummy variables, which represented the 13 four-week periods each year, and the dependent variable were all negative and significant. This suggests that demand for orange juice is highest during the first four-week period of each year.

Autocorrelation

According to Gujarati (2003), autocorrelation is the correlation between members of a series of observations ordered in time or space. An assumption of the classical linear regression model is that autocorrelation does not exist in the error terms of the explanatory variables. To test for this error, the Durbin h statistic was calculated which resulted in a measurement of 0.5641 and a probability of 0.2864. Consider the null hypothesis, “no autocorrelation.” For a probability greater than 0.05, the null hypothesis is not rejected and for a probability less than 0.05, the null hypothesis is rejected. For the national model, the Durbin h probability is greater than 0.05; therefore, the null hypothesis is not rejected, suggesting that autocorrelation is not present in the U.S. demand model for orange juice.

Elasticity at the Means for U.S. Orange Juice Demand

To determine the price, income, and information elasticities, the mean average of each variable was calculated. Those values and the measurements of elasticity for each variable are displayed in Table 5.2.

Table 5.2: Elasticity at the Mean for Price, Income, and Diet Media Coverage in the Model for U.S. Orange Juice Demand.

	Elasticity
Price (per gallon)	-0.241
Income (per capita)	0.143
Diet Media Coverage	-0.004

The price elasticity for orange juice is -0.24, which indicates that as the price per gallon increases, demand for orange juice decreases. Since the absolute value of the price elasticity is less than 1.0, price elasticity is inelastic, indicating that price has a relatively small impact on demand.

The income elasticity is 0.14, which indicates that as per capita discretionary income increases, per capita purchases increase. Since the elasticity is positive but less than 1.0, orange juice is classified as a normal necessity, which indicates that demand is not sensitive to changes in income most likely because there is a limited need to consume additional quantities of orange juice as income increases.

The elasticity of diet media coverage is -0.004. This measurement of elasticity indicates an inverse relationship between diet media coverage and per capita purchases of orange juice, although the frequency of newspaper articles relating to low-carbohydrate diets has a relatively small impact on demand.

U.S. Correlation Analysis

Kennedy (1993) states that high correlation between variables is defined by correlation coefficients greater than 0.80; the correlation analysis discussion for the U.S. model is with respect to the values displayed in Table 5.3.

Table 5.3: Correlation Coefficient Matrix for National Orange Juice Demand Model, significance of each correlation also shown.

	Per Capita Purchases	Previous Period Per Capita Purchases	Price	Per Capita Discretionary Income	Diet Media Coverage	Field Staff
Per Capita Purchases	1.000	0.856 (<.0001)	-0.813 (<.0001)	-0.448 (<.001)	0.440 (<.001)	0.493 (<.001)
Previous Period Per Capita Purchases	0.856 (<.0001)	1.000	-0.732 (<.0001)	-0.456 (<.0001)	-0.429 (<.0001)	0.479 (<.0001)
Price	-0.813 (<.0001)	-0.732 (<.0001)	1.000	0.837 (<.001)	0.583 (<.001)	-0.738 (<.001)
Per Capita Discretionary Income	-0.448 (<.001)	-0.456 (<.0001)	0.837 (<.001)	1.000	0.656 (<.001)	-0.850 (<.001)
Diet Media Coverage	-0.440 (<.001)	-0.429 (<.0001)	0.583 (<.001)	0.656 (<.001)	1.000	-0.562 (<.001)
Field Staff	0.493 (<.001)	0.479 (<.0001)	-0.738 (<.001)	-0.850 (<.001)	-0.562 (<.001)	1.000

Given the information displayed in Table 5.3, direct relationships between each of the explanatory variables and between the explanatory variables and dependent variable can be examined. Per capita purchases and purchases from the previous period were highly correlated, significant and positive. This result indicates consumer habit persistence when purchasing orange juice. Price was also highly correlated with the dependent variable (coefficient greater than 0.80). Price was negatively correlated and significant, which suggests that as price increases, per capita purchases of orange juice in the U.S. decrease. Price was also significantly and negatively correlated with per capita purchases from the previous period.

Although not strongly correlated, the relationship between diet media coverage as defined by the frequency of articles in national newspapers relating to low-carbohydrate diets and dieting was negatively correlated with per capita purchases of orange juice and purchases from the previous period, indicating that as diet coverage in newspapers increases, per capita purchases of orange juice decrease. The relationship between field staff and per capita purchases of orange juice was positively correlated and significant, suggesting that the existence of field staff, who aided with promotional and merchandising of orange juice, increased per capita purchases of orange juice.

As for the correlations between explanatory variables, the relationship between diet media coverage and income was positively correlated and significant, suggesting that consumers with higher levels of discretionary income may be more able to access diet media coverage in national newspapers. The relationship between field staff and diet media coverage was negatively correlated and significant, suggesting that as the field staff for the Florida Department of Citrus was eliminated, the diet media coverage in U.S. newspapers increased.

Southern Region Orange Juice Demand Model

The U.S. Southern Region retail purchases of orange juice represent the regional consumer demand for the product. The Southern region was selected as it is the region with the highest total purchases of orange juice and includes the state of Florida, where about 95 percent of oranges grown are processed into orange juice. During the 2002-2003 season, Florida produced more than 1.2 billion gallons of orange juice.

According to the Florida Department of Agriculture and Consumer Services (2003), citrus groves represented 8.37 percent of Florida total farm acreage in 2002 and accounted for 21 percent of Florida farm sales generating a value greater than \$1 billion

dollars annually, second only to greenhouse and nursery products. Florida is the nation's overwhelming leader in citrus production, accounting for more than 74 percent of the annual U.S. production in 2002-2003. Florida produces 18.5 percent of the world's oranges, ranking second only to Brazil, and Florida citrus growers cultivate 103.2 million trees on 796,540 acres.

Figure 5.4 represents the U.S. and Southern region per capita purchases of orange juice. The information displayed in the graph indicates that as U.S. per capita purchases decreased, so followed Southern region per capita purchases. From 1997 through 2001, Southern region per capita purchases were similar to U.S. retail per capita orange juice purchases. From 2001 through 2002, however, Southern region per capita purchases fell by 18.1%, a decrease much greater than the decrease in U.S. per capita purchases for the same period, 2.6%. Overall, from 2001 through 2004, Southern region per capita purchases of orange juice decline by 30.3% while U.S. purchases only declined by 11.4%.

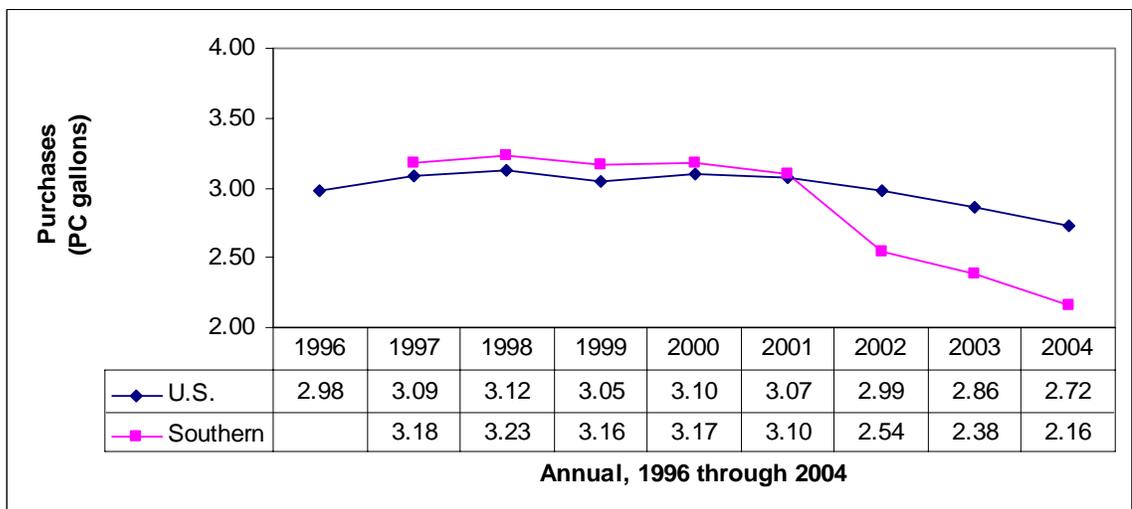


Figure 5.4: U.S. and Southern Region Per Capita Purchases of Orange Juice, Annual (1996 through 2004)

Given the much more prevalent decline within the southern region, relative to the U.S. trend, an additional analysis and demand estimation for this region may provide further insights into the effects of diet media coverage.

Empirical Results, Southern Region Orange Juice Demand

The demand of orange juice in the Southern region is expressed as:

$$D_t = f(\text{RP}, \text{DC}, \text{ST}, \text{PCINC}, \text{PCGAL}_{t-1}, \text{P3...P13}) \quad (5.2)$$

Where RP is the real weighted price per gallon of orange juice in the Southern region, DC is regional newspaper diet coverage, ST is a dummy variable representing the existence of field staff, PCINC is personal disposable income on a per capita basis, PCGAL_{t-1} is the dependent variable (per capita purchases of orange juice) lagged by one period, and P2 through P13 are seasonal dummy variables representing the 13 four-week periods annually from January 1997 through January 2005.

Explanatory variables are the same as those used in the model of U.S. demand for orange juice, with the exception of the information used to define the diet media coverage variable. In the Southern region model, diet media coverage represents the number of newspaper articles found in Southern region newspapers topically related to low-carbohydrate diets.

The demand equation is expressed in per capita terms and follows a linear functional form. The resulting model (Table 5.4) explains over 98% of the variation in retail purchases of orange juice. For the SAS program used to estimate the elasticity, regressions, and correlation analyses, refer to Appendix C2.

Table 5.4: Estimated Model Results of Southern Region Per Capita Orange Juice Demand

Variable	Description	Parameter	Std Error	t-Statistic
Intercept		0.096	0.021	4.45
PCGAL	Dependent Variable (t-1)	0.854	0.036	23.38
RP	Real Price	-0.023	0.006	-3.68
PCINC	Per Capita Disposable Income	9.435	5.368	-1.57
DC	Southern Newspaper Diet Coverage	-0.0004	0.0002	-1.98
ST	Field Staff	0.008	0.002	3.94
P2	Period 2 Dummy Variable	-0.016	0.002	-6.35
P3	Period 3 Dummy Variable	-0.006	0.002	-2.52
P4	Period 4 Dummy Variable	-0.016	0.002	-6.32
P5	Period 5 Dummy Variable	-0.012	0.003	-4.50
P6	Period 6 Dummy Variable	0.010	0.003	-3.69
P7	Period 7 Dummy Variable	-0.010	0.003	-3.18
P8	Period 8 Dummy Variable	0.004	0.003	-1.34
P9	Period 9 Dummy Variable	0.0001	0.003	0.04
P10	Period 10 Dummy Variable	-0.007	0.003	-2.88
P11	Period 11 Dummy Variable	-0.006	0.003	-2.23
P12	Period 12 Dummy Variable	-0.003	0.002	-1.26
P13	Period 13 Dummy Variable	-0.018	0.002	-4.34
Total R ²	0.9831			
Regress R ²	0.9831			
Durbin-h	0.1010			
P > h	0.4598			

The relationship between purchases and price was negatively related and significant, resulting in a coefficient of -0.02. This indicates that the expected inverse relationship between price and demand exists and that as the price per gallon of orange juice increases, per capita purchases of orange juice in the Southern region decrease.

The relationship between purchases and diet media coverage was negatively related and significant, returning a coefficient of -0.0004. This coefficient, however, is just insignificant at the 0.05 level (t-statistic equals 1.98), which suggests that the effect of newspapers is not different than zero at the 95% confidence level. If the confidence level were adjusted to the 90% level, this variable would be significant, suggesting diet media coverage in Southern region newspapers does have a negative effect upon per capita

purchases of orange juice. Hypothesis 2 stated, “Demand for orange juice is correlated with health-and diet-related information in the media.” This coefficient result of -0.0004 and corresponding t-statistic of -1.98 indicates that the hypothesis should not be rejected at the 90% confidence level and that the relationship between purchases of orange juice and diet media coverage is negative and significant.

The relationship between purchases and the dummy variable representing the existence of field staff was positively related and significant, resulting in a coefficient of 0.008. This suggests that the existence of field staff who worked with retailers and food service in promoting Florida orange juice and helped retailers in the area of merchandising positively and significantly affected purchases of orange juice.

The relationship between purchases and disposable per capita income was negatively related with a coefficient of -8.435, although insignificant at the 95% confidence level, which suggests that per capita discretionary income has an effect no different than zero upon per capita purchases of orange juice in the Southern region.

Finally, the relationship between purchases in the current time period and purchases from the previous time period, a measurement of habit persistence, were positive and significant. This result is similar to the relationship between current and previous purchases in the U.S. demand model, which indicates that purchases of orange juice are based on habit and consumers in the Southern region who previously purchased orange juice are more likely to purchase orange juice again than those consumers in the Southern region who have not previously purchased orange juice.

All seasonal dummy variables in the Southern region analysis were not found to be significant, as in the U.S. model, nor did all the variables have the same sign as they did in the U.S. model.

Autocorrelation

As discussed in the previous section, Gujarati (2003) defines autocorrelation as the correlation between members of a series of observations ordered in time or space and that the classical linear regression model assumes that such autocorrelation does not exist in the error terms of the explanatory variables. Again considering the null hypothesis, “no autocorrelation,” the null hypothesis would not be rejected when the probability is greater than 0.05. For the regional model, the Durbin h probability is 0.4598, which is greater than 0.05; therefore, the null hypothesis is not rejected, indicating that the model does not have autocorrelation.

Elasticity at the Means for Southern Region Orange Juice Demand

To determine the price, income, and information elasticities, the mean average of each variable was calculated. Both values are displayed for each variable in Table 5.5.

Table 5.5: Elasticity at the Mean for Price, Income, and Diet Media Coverage in the Model for Southern Region Orange Juice Demand.

	Elasticity
Price (per gallon)	-0.206
Income (per capita)	-0.064
Diet media coverage	-0.004

The price elasticity for orange juice is -0.21, which indicates that as price per gallon increases, demand for orange juice decreases. Since the absolute value of the price elasticity is less than 1.0, price elasticity is inelastic, indicating that price has a relatively small impact on demand.

The income elasticity is -0.06, which indicates that as per capita discretionary income increases, per capita purchases decrease. Since the negative, orange juice would

be classified as an inferior good. The income coefficient, however, was insignificant in the model, which indicates that the effect of income upon purchases of orange juice in the Southern Region is no different than zero.

The elasticity of diet media coverage is -0.004. This measurement of elasticity indicates an inverse relationship between diet media coverage and per capita purchase of orange juice, although the frequency of newspaper articles relating to low-carbohydrate diets has a relatively small impact on demand.

Southern Region Correlation Analysis

Kennedy (1993) states that high correlation between variables is defined by correlation coefficients greater than 0.80; the correlation analysis discussion for the Southern region is with regards to the values displayed in Table 5.6.

Table 5.6: Correlation Coefficient Matrix for Southern Region Orange Juice Demand Model, significance of each correlation also shown.

	Per Capita Purchases	Previous Period Per Capita Purchases	Price	Per Capita Discretionary Income	Field Staff	Diet media coverage
Per Capita Purchases	1.000	0.971 (<0.0001)	0.217 (0.0260)	-0.858 (<.001)	0.842 (<.001)	-0.600 (<.001)
Previous Period Per Capita Purchases	0.971 (<0.0001)	1.000	0.275 (0.0047)	-0.858 (<0.0001)	0.821 (<0.0001)	-0.589 (<0.0001)
Price	0.217 (0.0260)	0.275 (0.0047)	1.00	-0.503 (<.0001)	0.420 (<.001)	-0.334 (0.0005)
Per Capita Discretionary Income	-0.858 (<.001)	-0.858 (<0.0001)	-0.503 (<.0001)	1.00	-0.857 (<.001)	0.579 (<.001)
Field Staff	0.842 (<.001)	0.821 (<0.0001)	0.420 (<.001)	-0.857 (<.001)	1.00	-0.463 (<.001)
Diet media coverage	-0.600 (<.001)	-0.589 (<0.0001)	-0.334 (0.0005)	0.579 (<.001)	-0.463 (<.001)	1.00

Given the information displayed in Table 5.6, direct relationships between each of the explanatory variables and between the explanatory variables and dependent variable can be determined. Three of the explanatory variables, previous purchases, field staff, and per capita discretionary income, are highly correlated with the dependent variable (coefficient greater than 0.80); previous purchases and field staff are positively correlated and significant and income is negatively correlated and significant. Positively correlated previous purchases and the dependent variable suggest that habit persistence does exist for those consumers in the Southern region. Additionally, as field staff or income increases, per capita purchases of orange juice in the Southern region increase or decrease, respectively. Although not strongly correlated, the relationship between Southern region diet media coverage and per capita purchases is negatively correlated, indicating that as the frequency of newspaper articles increases, purchases of orange juice within the region decrease. This relationship is also true for the diet media variable and previous purchases.

It is also important to note that diet media coverage and field staff is negatively correlated, suggesting that as the field staff was eliminated, diet media coverage in the Southern region increased. Additionally, income and diet media coverage is positively correlated, which suggests that consumers with higher income levels are more able to access diet media coverage, especially that information which is portrayed in regional newspapers.

Conclusions

The second hypothesis was that demand for orange juice was correlated with health-and diet-related information in the media. For this study, diet media coverage was

defined by the frequency of newspaper articles topically related to low-carbohydrate diets and dieting and is represented by the diet media coverage (DC) variable in both models. This variable was significant in both the U.S. and regional model at the 90% confidence level and had negative coefficients, indicating that as diet media coverage in national and regional newspapers related to low-carbohydrate dieting increased, per capita purchases of orange juice decreased. Therefore, this hypothesis would not be rejected at the 90% confidence level.

This conclusion is also supported by Figures 5.1, 5.2, and 5.3, which all indicate that as annual per capita purchases of orange juice decreased, the annual number of articles relating to low-carbohydrate diets was increasing, both in the U.S. and Southern region.

CHAPTER 6 SUMMARY, IMPLICATIONS, AND FUTURE RESEARCH

Fruit and fruit juices have generally been accepted by the public and nutritionists as excellent nutrient sources and important additions to a healthy diet. Culturally, juice and orange juice in particular have a direct association with breakfast meals. In the United States, these preferences have come under attack by low-carbohydrate diet proponents and adherents. Popular diet media coverage about low-carbohydrate diets, specifically the Atkins' and South Beach diets, has become prevalent through newspapers, magazines, and diet books.

The researchable question presented in Chapter 1 questioned if and how the cultural history of dieting in the United States over the past 20 years has affected consumer demand for orange juice. This served as a basis for two hypotheses, that dieting trends occur in cycles, such that they follow a cyclical pattern similar to the product life-cycle theory and that demand for orange juice is correlated with diet media coverage in the media.

In order to test these two hypotheses, four research objectives were defined. Those objectives included estimating U.S. consumers demand for orange juice using purchase data from AC Nielsen, using content analysis to generate quantified measures of low-carbohydrate diet media coverage, overlaying media coverage data to coincide with the purchase data time period from October 1996 through December 2004, and finally modeling consumer demand as a function of a set of independent variables that include the variable "media coverage."

Summary of Data Collection

To address both hypotheses, purchase data were collected from the Florida Department of Citrus. Data were also collected from electronic databases representing the frequency of diet media coverage in national magazines and national and regional newspapers. Additional data collected from electronic databases and representing weekly bestseller rankings for popular diet books were also used to address the first hypothesis.

Major Findings

Hypothesis 1

In addressing the first hypothesis, the product life cycle theory was applied to the frequency of diet media coverage in national magazines and national and regional newspapers and magazines. The product life cycle theory was also applied to bestseller rankings of popular diet books. The product life cycle consists of four phases: introduction, growth, maturity, and decline. For the purposes of this study, these phases were defined with regards to the frequency of diet media articles printed each four-week period.

Of all media articles collected, 386 were collected from national newspaper sources and the highest concentrations of newspaper articles were printed from November 2002 through December 2004. An additional 58 articles were collected from national magazine sources and the highest concentrations of those articles occurred from November 2002-December 2004. Since magazine articles are printed on a monthly to bimonthly basis, it is not surprising to note that an average of only 0.48 diet articles was printed each four-week period. Additionally, the two four-week periods corresponding with the highest frequency of collected articles occurred during July and August 2004,

five months later than the two four-week periods corresponding with the highest frequency of national newspaper articles.

For the Southern region analysis, 223 articles were collected from regional newspapers. The highest concentrations of collected articles were printed from November 2002 through December 2004 and the two four-week periods in which the highest frequencies of regional newspaper articles were printed occurred during January and February 2004, the same eight week period as discovered in the national newspaper analysis.

The frequency of articles collected from Southern region newspapers also appears to follow a cycle which may reflect dieting trends, although some distinct differences between the national and regional newspaper analysis include:

- The introduction phase occurred from October 1995 through August 2003 and was 21 periods longer than the introduction phase for national newspaper articles,
- The growth phase occurred from March 2003 through December 2004, and represented a growth phase shorter in duration than the growth phase for diet media coverage collected from national newspaper articles. This phase did terminate during the same four-week period (December 2004) for both national and regional newspapers, and
- The maturity phase occurred from January and September 2004 and concluded two months later than the maturity phase for national newspaper articles.

In addition, the graphic analysis presented in Chapter 4 did appear to indicate that diet life cycles are reflected in the frequency of national and regional newspaper and magazine articles. Whether this confirms that a diet life cycle exists is questionable, it yet does provide some insight as to the possibility that diet trends may occur in cycles and may be reflected by the frequency of diet media coverage portrayed in national newspapers and magazines.

In addition to diet media coverage found in newspapers and magazines, consumers may also access dieting information by reading popular books about diets and dieting. The popularity of two diet books, *Atkins' New Diet Revolution* and *The South Beach Diet* were used as a proxy to identify the popularity of the low-carbohydrate dieting trend. Using bestseller rankings published by *Publishers Weekly*, it was determined that the popularity of the Atkins' diet book occurred from 1996 through 2003. This widespread popularity of the Atkins book began nearly four years after the book was published and appeared to be bimodal, with popularity of the book rising and falling twice over the eight-year period. *The South Beach Diet* book, however, was published in April 2003 and immediately appeared on the Publisher's Weekly bestseller list, with popularity of the book continuing through December 2004. It is important to note that both books were popular from April through December 2003 and it is inconclusive as to which book had the greatest impact on encouraging the popularity of low-carbohydrate dieting.

Considering the research by Sornette, et al (2004) on how books ascend bestseller lists, it is important to note the time differences in which each book, Atkins' and South Beach, ascended the Publisher's Weekly bestseller lists. As previously indicated, the Atkins' diet book was published in July 1992 and did not appear on the Publishers' Weekly bestseller list until April 1996, nearly four years after being published. This is in comparison to the immediate appearance of *The South Beach Diet* book, which was published in April 2003 and first appeared on the Publishers' Weekly bestseller list during the same month. Sornette et al suggested that books, whose popularity is due to "endogenous shocks" or recommendations by friends and family, will ascend bestseller lists at a slow rate (i.e. Atkins New Diet Revolution). Their research also suggests that

books, whose popularity is due to “exogenous shocks” such as a celebrity endorsement, will rise and decline more abruptly on bestseller lists (i.e. *The South Beach Diet*).

Horovitz (2004) noted that *The South Beach Diet* was endorsed by celebrities such as Bette Midler, Nicole Kidman and former President Bill Clinton, which would qualify for those exogenous shocks.

Given the observed trends representing book popularity and the frequency of newspaper and magazine articles, it does appear that diet media coverage about a diet trend does follow some pattern, but as to whether this pattern defines the popularity of a diet is inconclusive. Also, it is uncertain as to what degree such diet media coverage impacts the popularity of a diet or what types of diet media coverage have the greatest impact upon diet popularity. Therefore, the first hypothesis should not be rejected based upon the inconclusiveness of the results. Such inconclusiveness is due in part to the absence of weekly bestseller rankings (due to the limited number of books listed on bestseller lists) throughout the data set and the absence of newspaper and magazine articles during some four-week periods, which may have resulted in part to the time period length selected for the study. Therefore, to better address the first hypothesis, a further analysis of additional newspaper and magazine sources or other sources of diet media coverage would need to be conducted to determine if other or additional diet media coverage sources better define the life cycle of a diet.

Hypothesis 2

The second hypothesis addressed the relationship between consumer demand for orange juice and diet media coverage. This research found that orange juice purchases and diet media coverage are negatively related, as found with the correlation analysis. This result was further confirmed during the regression analysis which indicated the

presence of a statistically significant and negative effect of newspaper articles upon per capita purchases of orange juice in both the U.S. and for the Southern region.

Additionally, the elasticity of diet media coverage in both models was found to be negative, although inelastic. These results suggest that as diet media coverage relating to low-carbohydrate diets and dieting in national and Southern region newspapers increased, per capita purchases of orange juice decreased, although the impact upon demand was relatively small.

Other results in the U.S. model of consumer demand for orange juice included the negative and significant relationship between purchases and price, and the significant and positive relationships between purchases and the dummy variable representing the existence of field staff, purchases and disposable per capita income, purchases and purchases from the previous time period (lagged one period). For the Southern region model, negative and statistically significant relationships between purchases and price and purchases and disposable income were identified, as were significant and positive relationships between purchases and the existence of field staff and purchases and purchases from the previous time period.

Since graphical analysis, estimations of correlation coefficients and the regression analyses (U.S. and Southern region) all provide similar evidence that diet media coverage and consumer demand are negatively correlated, the second hypothesis should not be rejected.

Research Implications

This study has examined the effect that the cultural history of dieting has had upon purchases for orange juice in the United States and the Southern region and highlighted three major issues.

The first issue which should be addresses is whether or not diet trends impact agricultural industries. This research indicated that diet media coverage is a statistically significant explanatory variable when modeling U.S. orange juice demand. This provides some indirect evidence that media coverage may affect dieting trends since the demand for food products that are affected by those dieting trends will also change. The challenges which accompany these shifts in consumer perceptions and therefore demand have the potential to affect industries throughout the agriculture sector. By understanding the effect that diet media coverage, such as newspaper, magazine articles, and books about dieting has had upon demand for orange juice, a better understanding can be obtained and applied to other affected industries by current and future dieting trends.

Because obesity has become an even greater concern for Americans, the popularity of diets and dieting is likely to increase as will the potential for dieting trends to affect purchasing decisions and eating habits. Diets and dieting will continue to be an on-going issue of interest within the agriculture sector, although the industries affected by a dieting trend may change as diet trends rise and fall in popularity. Understanding how information about dieting trends is accessed and applied by consumers will help aid negatively affected agricultural industries in dealing with demand impacts of dieting trends. As consumers turn towards more popular sources of dieting information, such as television, internet, newspapers, and magazines, agricultural industries will also have to adjust marketing strategies and alliances to better communicate with consumers.

Although the effect that a dieting trend may have upon a particular industry may not be prevented, it is possible that the findings from this study can help diminish this effect. For example, industries may determine that rather than investing time and money

in product development to meet constantly shifting consumer nutritional perceptions and demands, resources may best be directed towards public relation efforts to lessen the effect that even temporary shifts in consumer nutritional perceptions and demand might have upon a particular food product.

A second issue which should be addressed is whether media coverage mirrors, or creates, a cultural phenomenon, such as the low-carbohydrate dieting trend. As indicated earlier, data on the frequency of newspaper and magazine articles regarding low-carbohydrate diets and dieting were collected. Diet media coverage in this study was considered as a proxy of the media setting an agenda about weight loss and dieting. Alternatively, frequency of diet media coverage may only reflect societal norms, since dieting trends such as the low-carbohydrate dieting trend are usually picked up from society by a media producer, who then writes about them, leading to, in some cases, vast media attention. This reflection of societal norms, however, would be slightly distorted, since it is uncertain as to whether each media article truly captures a representative sample of the overall population.

Additionally, the frequency of articles relating to low-carbohydrate diets may not truly reflect the preferences of the overall population since consumers with higher incomes are more able to access diet media coverage in newspapers, magazines, or popular diet books. The frequency of articles may, however, reflect the preferences of consumers with higher levels of income that are then more able to acquire dieting information and apply such information to eating and purchase habits. Those consumers with higher incomes are considered also more likely to purchase orange juice.

A third and final issue that should be addressed with regards to this study is whether or not content analysis is a useful method for measuring information and its potential impact upon evolving market trends and consumer tastes and preferences. Content analysis was the method used in this study to guide the process for measuring diet media coverage in newspapers and magazines. The frequencies of articles collected each four-week period were then included in the models for U.S. and Southern region demand for orange juice. This “diet media coverage” variable was statistically significant and had the expected signs, suggesting that data generated by content analysis can be applicable to econometric estimations of consumer demand.

Suggestions for Future Research

Identifying the next dieting trend is difficult and never certain. Although many nutritionists seem to indicate that consumers will become increasingly interested in foods based upon the levels of saturated and unsaturated fats, it is possible that the next dieting trend will be an extension of the low-carbohydrate dieting trend and be based upon the effect that sugars have upon blood sugar levels. This effect is known as the Glycemic index and is a component of *The South Beach Diet*.

According to Glycemicindex.com, hosted by the University of Sydney, the glycemic index (GI) is a ranking of carbohydrates on a scale from 0 to 100 according to the extent to which they raise blood sugar levels after being consumed. Foods with a high GI are those which are rapidly digested and absorbed and result in marked fluctuations in blood sugar levels. Low-GI foods, by virtue of their slow digestion and absorption, produce gradual rises in blood sugar and insulin levels, and have proven benefits for health. Low GI diets have been shown to improve both glucose and lipid levels in people with diabetes (type 1 and type 2). They have benefits for weight control because they

help control appetite and delay hunger. Low GI diets also reduce insulin levels and insulin resistance. The website also refers to recent studies from Harvard School of Public Health which indicates that the risks of diseases such as type 2 diabetes and coronary heart disease are strongly related to the GI levels of the overall diet.

Considering the impact that these or other future dieting trends may have upon various agriculture industries, further analysis of additional newspaper and magazine sources or other sources of diet media coverage may better define the life cycle of a diet and consequently help affected agricultural industries to quickly respond to shifts in consumer purchase habits. Further research may also include confirmation that media can negatively impact purchases of food products, especially diet media coverage. Finally, understanding how consumers' access, process and respond to diet and health information are other areas of potential future research.

Alternative Information Sources

As discussed previously, consumers are increasingly turning to mass information sources as primary sources for dieting and health information. Whether it is unsaturated fats or the glycemic index, the next dieting trend is sure to impact agribusiness and production agriculture. Sources of information available about future dieting trends will be important to identify in order that affected industries will be able to address accompanying changes in consumer perspectives about certain food products in light of a particular diet or dieting trend.

Sources that should be considered for further research include information accessible through the Internet and reported on television, both in newscasts and as portrayed in television shows. This area of future research might also include determining what other diet media coverage sources have an effect on consumer

nutritional perceptions. For instance, identifying whether government sources of health and diet information have the same, less or greater influence as compared to other diet media coverage sources would be beneficial to the agricultural sector.

Media Impact and Demand

Further confirmation that media can negatively impact purchases of food products, especially diet media coverage, would add validity to this and previous studies regarding the effect that media coverage has upon demand for food products. This area of further research might also involve determining if all food products or only particular food products may be affected by dieting trends. For instance, researchers may determine whether food products considered necessities, luxuries, or inferior goods are equally impacted by diet media coverage and therefore, dieting trends. This will particularly be helpful to agricultural industries affected by dieting trends, when determining how to respond to information portrayed by the media and other sources, specifically how individual industries should respond to dieting trends as compared to the entire agricultural sector.

Information Access and Application by Consumers

Determining how consumer nutritional perceptions are translated from various diet media coverage sources and whether or not health motivation is related to the frequency and magnitude of diet media coverage is the final area of further research to be suggested. As consumers access and apply diet information from various sources to their purchasing decisions, understanding how the information accessed is then translated into purchase decisions and eating habits will help agricultural industries understand the link between information and consumer demand, such an understanding would help industries better respond to not only dieting trends, but general shifts in consumer tastes and preferences.

APPENDIX A
DIET MEDIA COVERAGE DATA TABLES

Table A.1: National Diet Media Coverage Collected from National Newspapers and Magazines, October 1995 through January 2005

Period	Total	News	Magazine
10/7/1995	2	2	0
11/4/1995	0	0	0
12/2/1995	0	0	0
12/30/1995	0	0	0
1/27/1996	0	0	0
2/24/1996	0	0	0
3/23/1996	1	0	1
4/20/1996	1	0	1
5/18/1996	2	1	1
6/15/1996	1	0	1
7/13/1996	0	0	0
8/10/1996	0	0	0
9/7/1996	1	1	0
10/5/1996	0	0	0
11/2/1996	0	0	0
11/30/1996	0	0	0
12/28/1996	0	0	0
1/25/1997	0	0	0
2/22/1997	1	0	1
3/22/1997	1	0	1
4/19/1997	1	1	0
5/17/1997	2	2	0
6/14/1997	0	0	0
7/12/1997	2	0	2
8/9/1997	0	0	0
9/6/1997	0	0	0
10/4/1997	0	0	0
11/1/1997	0	0	0
11/29/1997	0	0	0
12/27/1997	0	0	0
1/24/1998	0	0	0
2/21/1998	0	0	0
3/21/1998	0	0	0
4/18/1998	0	0	0

Table A.1 Continued

Period	Total	News	Magazine
5/16/1998	0	0	0
6/13/1998	1	1	0
7/11/1998	0	0	0
8/8/1998	2	2	0
9/5/1998	0	0	0
10/3/1998	0	0	0
10/31/1998	0	0	0
11/28/1998	2	1	1
12/26/1998	0	0	0
1/23/1999	1	1	0
2/20/1999	0	0	0
3/20/1999	1	0	1
4/17/1999	0	0	0
5/15/1999	0	0	0
6/12/1999	2	2	0
7/10/1999	2	1	1
8/7/1999	1	1	0
9/4/1999	0	0	0
10/2/1999	0	0	0
10/30/1999	3	2	1
11/27/1999	7	5	2
12/25/1999	3	3	0
1/22/2000	3	3	0
2/19/2000	0	0	0
3/18/2000	4	4	0
4/15/2000	0	0	0
5/13/2000	4	4	0
6/10/2000	2	2	0
7/8/2000	0	0	0
8/5/2000	2	1	1
9/2/2000	4	4	0
9/30/2000	2	2	0
10/28/2000	1	1	0
11/25/2000	2	2	0
12/23/2000	1	1	0
1/20/2001	1	1	0
2/17/2001	0	0	0
3/17/2001	0	0	0
4/14/2001	2	2	0
5/12/2001	1	1	0
6/9/2001	1	0	1
7/7/2001	2	2	0

Table A.1 Continued

Period	Total	News	Magazine
8/4/2001	2	2	0
9/1/2001	3	3	0
9/29/2001	0	0	0
10/27/2001	5	5	0
11/24/2001	1	1	0
12/22/2001	2	2	0
1/19/2002	1	1	0
2/16/2002	0	0	0
3/16/2002	0	0	0
4/13/2002	0	0	0
5/11/2002	0	0	0
6/8/2002	4	2	2
7/6/2002	1	1	0
8/3/2002	5	4	1
8/31/2002	6	6	0
9/28/2002	5	2	3
10/26/2002	4	3	1
11/23/2002	3	3	0
12/21/2002	7	5	2
1/18/2003	9	8	1
2/15/2003	3	3	0
3/15/2003	1	1	0
4/12/2003	8	8	0
5/10/2003	12	10	2
6/7/2003	14	13	1
7/5/2003	5	5	0
8/2/2003	1	1	0
8/30/2003	8	7	1
9/27/2003	7	6	1
11/1/2003	12	9	3
11/29/2003	12	10	2
12/27/2003	13	13	0
1/24/2004	27	26	1
2/21/2004	27	27	0
3/20/2004	17	15	2
4/17/2004	17	15	2
5/15/2004	17	13	4
6/12/2004	26	25	1
7/10/2004	12	5	7
8/7/2004	17	15	2
9/4/2004	16	16	0
10/2/2004	11	10	1

Table A.1 Continued

Period	Total	News	Magazine
10/30/2004	8	7	1
11/27/2004	11	10	1
12/25/2004	8	8	0
1/22/2005	4	4	0
Grand Total	444	386	58

Table A.2: Southern Region Health Information as Collected from Regional Newspapers,
January 1997 through January 2005

Period	News Articles
1/25/1997	1
2/22/1997	2
3/22/1997	0
4/19/1997	0
5/17/1997	0
6/14/1997	0
7/12/1997	0
8/9/1997	0
9/6/1997	0
10/4/1997	0
11/1/1997	0
11/29/1997	0
12/27/1997	0
1/24/1998	2
2/21/1998	1
3/21/1998	1
4/18/1998	0
5/16/1998	2
6/13/1998	0
7/11/1998	1
8/8/1998	0
9/5/1998	0
10/3/1998	1
10/31/1998	0
11/28/1998	1
12/26/1998	0
1/23/1999	0
2/20/1999	0
3/20/1999	1
4/17/1999	0
5/15/1999	0
6/12/1999	3
7/10/1999	0
8/7/1999	0
9/4/1999	0
10/2/1999	0
10/30/1999	0
11/27/1999	1
12/25/1999	1
1/22/2000	3
2/19/2000	1
3/18/2000	5
4/15/2000	0

Table A.2 Continued

Period	News Articles
5/13/2000	0
6/10/2000	0
7/8/2000	0
8/5/2000	1
9/2/2000	2
9/30/2000	0
10/28/2000	0
11/25/2000	0
12/23/2000	0
1/20/2001	0
2/17/2001	0
3/17/2001	0
4/14/2001	0
5/12/2001	0
6/9/2001	0
7/7/2001	0
8/4/2001	0
9/1/2001	0
9/29/2001	1
10/27/2001	1
11/24/2001	0
12/22/2001	0
1/19/2002	0
2/16/2002	2
3/16/2002	3
4/13/2002	0
5/11/2002	2
6/8/2002	2
7/6/2002	0
8/3/2002	0
8/31/2002	0
9/28/2002	2
10/26/2002	0
11/23/2002	2
12/21/2002	3
1/18/2003	1
2/15/2003	1
3/15/2003	7
4/12/2003	2
5/10/2003	5
6/7/2003	5
7/5/2003	1
8/2/2003	0
8/30/2003	5

Table A.2 Continued

Period	News Articles
9/27/2003	4
11/1/2003	6
11/29/2003	7
12/27/2003	8
1/24/2004	18
2/21/2004	18
3/20/2004	10
4/17/2004	8
5/15/2004	14
6/12/2004	10
7/10/2004	11
8/7/2004	3
9/4/2004	12
10/2/2004	2
10/30/2004	7
11/27/2004	6
12/25/2004	4
1/22/2005	0
Grand Total	223

Table A.3: Weekly Bestseller Rankings for *Atkins' New Diet Revolution* by Dr. Robert Atkins, New York Times and Publisher Weekly Bestseller Lists, April 1996 through February 2004. (Weeks that the book was not ranked are indicated as NR)

Week	New York Times	Publisher's Weekly
4/28/1996	4	NR
5/5/1996	4	NR
5/12/1996	4	NR
5/19/1996	4	NR
5/26/1996	3	NR
6/2/1996	3	NR
6/9/1996	3	NR
6/16/1996	3	NR
6/23/1996	3	NR
6/30/1996	3	NR
7/7/1996	3	NR
7/14/1996	3	NR
7/21/1996	3	NR
7/28/1996	NR	NR
8/4/1996	2	NR
8/11/1996	2	NR
8/18/1996	2	NR
8/25/1996	2	NR
9/1/1996	2	NR
9/8/1996	2	NR
9/15/1996	2	NR
9/22/1996	2	NR
9/29/1996	4	NR
10/6/1996	4	NR
10/13/1996	4	NR
10/20/1996	5	NR
10/27/1996	NR	NR
11/3/1996	NR	NR
11/10/1996	4	NR
11/17/1996	NR	NR
11/24/1996	NR	NR
12/1/1996	NR	NR
12/8/1996	NR	NR
12/15/1996	NR	NR
12/22/1996	NR	NR
12/29/1996	NR	14
1/5/1997	NR	5
1/12/1997	NR	5
1/19/1997	NR	5
1/26/1997	NR	6
2/2/1997	3	9

Table A.3 Continued

Week	New York Times	Publisher's Weekly
2/9/1997	3	13
2/16/1997	3	12
2/23/1997	3	7
3/2/1997	3	8
3/9/1997	3	8
3/16/1997	2	9
3/23/1997	2	13
3/30/1997	3	9
4/6/1997	2	7
4/13/1997	2	9
4/20/1997	2	11
4/27/1997	2	6
5/4/1997	1	13
5/11/1997	3	11
5/18/1997	NR	10
5/25/1997	NR	8
6/1/1997	4	13
6/8/1997	3	NR
6/15/1997	3	NR
6/22/1997	NR	12
6/29/1997	4	12
7/6/1997	4	7
7/13/1997	4	12
7/20/1997	4	9
7/27/1997	4	7
8/3/1997	4	5
8/10/1997	4	7
8/17/1997	4	12
8/24/1997	3	6
8/31/1997	3	8
9/7/1997	3	9
9/14/1997	3	11
9/21/1997	3	9
9/28/1997	3	9
10/5/1997	3	7
10/12/1997	3	11
10/19/1997	3	10
10/26/1997	3	7
11/2/1997	3	5
11/9/1997	3	6
11/16/1997	3	NR
11/23/1997	3	NR
11/30/1997	4	12
12/7/1997	4	14

Table A.3 Continued

Week	New York Times	Publisher's Weekly
12/14/1997	NR	13
12/21/1997	NR	12
12/28/1997	NR	7
1/4/1998	NR	7
1/11/1998	NR	5
1/18/1998	4	4
1/25/1998	2	6
2/1/1998	2	6
2/8/1998	2	3
2/15/1998	2	3
2/22/1998	2	4
3/1/1998	2	3
3/8/1998	2	3
3/15/1998	3	2
3/22/1998	3	1
3/29/1998	3	2
4/5/1998	3	3
4/12/1998	2	2
4/19/1998	2	4
4/26/1998	3	4
5/3/1998	2	4
5/10/1998	2	4
5/17/1998	2	3
5/24/1998	4	7
5/31/1998	2	6
6/7/1998	2	8
6/14/1998	2	7
6/21/1998	2	3
6/28/1998	2	4
7/5/1998	2	3
7/12/1998	2	3
7/19/1998	1	1
7/26/1998	1	2
8/2/1998	2	2
8/9/1998	1	2
8/16/1998	1	1
8/23/1998	1	2
8/30/1998	1	1
9/6/1998	1	2
9/13/1998	1	2
9/20/1998	1	1
9/27/1998	1	1
10/4/1998	1	1
10/11/1998	1	1

Table A.3 Continued

Week	New York Times	Publisher's Weekly
10/18/1998	1	2
10/25/1998	1	NR
11/1/1998	1	1
11/8/1998	1	1
11/15/1998	1	1
11/22/1998	2	1
11/29/1998	2	4
12/6/1998	2	5
12/13/1998	3	3
12/20/1998	4	3
12/27/1998	NR	NR
1/3/1999	NR	3
1/10/1999	NR	3
1/17/1999	1	3
1/24/1999	1	3
1/31/1999	1	3
2/7/1999	1	4
2/14/1999	1	3
2/21/1999	1	2
2/28/1999	2	1
3/7/1999	1	1
3/14/1999	1	1
3/21/1999	1	1
3/28/1999	1	1
4/4/1999	1	1
4/11/1999	1	1
4/18/1999	1	1
4/25/1999	1	2
5/2/1999	1	2
5/9/1999	1	2
5/16/1999	1	3
5/23/1999	2	3
5/30/1999	1	6
6/6/1999	1	2
6/13/1999	1	2
6/20/1999	1	3
6/27/1999	1	2
7/4/1999	2	4
7/11/1999	1	3
7/18/1999	1	3
7/25/1999	1	2
8/1/1999	1	2
8/8/1999	1	2
8/15/1999	1	2

Table A.3 Continued

Week	New York Times	Publisher's Weekly
8/22/1999	1	2
8/29/1999	1	2
9/5/1999	1	1
9/12/1999	1	1
9/19/1999	1	1
9/26/1999	1	1
10/3/1999	1	2
10/10/1999	1	2
10/17/1999	1	1
10/24/1999	1	1
10/31/1999	4	3
11/7/1999	3	4
11/14/1999	3	2
11/21/1999	2	8
11/28/1999	2	14
12/5/1999	3	6
12/12/1999	4	3
12/19/1999	3	3
12/26/1999	NR	4
1/2/2000	NR	4
1/9/2000	NR	4
1/16/2000	1	4
1/23/2000	NR	3
1/30/2000	NR	2
2/6/2000	1	2
2/13/2000	1	4
2/20/2000	1	4
2/27/2000	1	5
3/5/2000	1	3
3/12/2000	1	5
3/19/2000	1	5
3/26/2000	1	7
4/2/2000	1	3
4/9/2000	1	3
4/16/2000	1	4
4/23/2000	1	6
4/30/2000	1	8
5/7/2000	2	8
5/14/2000	3	11
5/21/2000	3	9
5/28/2000	4	10
6/4/2000	3	13
6/11/2000	4	12
6/18/2000	2	5

Table A.3 Continued

Week	New York Times	Publisher's Weekly
6/25/2000	2	6
7/2/2000	3	6
7/9/2000	2	13
7/16/2000	2	NR
7/23/2000	2	11
7/30/2000	1	10
8/6/2000	1	12
8/13/2000	2	6
8/20/2000	3	6
8/27/2000	2	6
9/3/2000	2	7
9/10/2000	3	7
9/17/2000	2	12
9/24/2000	4	11
10/1/2000	4	10
10/8/2000	5	12
10/15/2000	4	12
10/22/2000	4	10
10/29/2000	3	14
11/5/2000	2	14
11/12/2000	3	14
11/19/2000	3	11
11/26/2000	5	9
12/3/2000	NR	5
12/10/2000	NR	10
12/17/2000	NR	13
12/24/2000	NR	NR
12/31/2000	NR	NR
1/6/2001	NR	NR
1/7/2001	NR	13
1/14/2001	3	12
1/21/2001	3	NR
1/28/2001	5	NR
2/4/2001	NR	NR
2/11/2001	5	13
2/25/2001	5	NR
3/4/2001	5	14
3/11/2001	5	NR
3/18/2001	5	NR
3/25/2001	5	NR
4/1/2001	5	NR
4/8/2001	5	NR
4/15/2001	5	NR
4/22/2001	5	NR

Table A.3 Continued

Week	New York Times	Publisher's Weekly
4/29/2001	5	NR
5/6/2001	3	NR
5/13/2001	3	NR
5/20/2001	6	NR
5/27/2001	NR	NR
6/3/2001	NR	NR
6/10/2001	NR	NR
6/17/2001	NR	NR
6/24/2001	NR	NR
7/1/2001	NR	NR
7/8/2001	NR	NR
7/15/2001	3	NR
7/22/2001	5	NR
7/29/2001	NR	NR
8/5/2001	NR	NR
8/12/2001	5	NR
8/19/2001	5	NR
8/26/2001	NR	NR
9/2/2001	5	NR
9/9/2001	5	NR
9/16/2001	NR	NR
9/23/2001	NR	NR
9/30/2001	NR	NR
10/7/2001	NR	NR
10/14/2001	NR	NR
10/21/2001	6	NR
10/28/2001	NR	NR
11/4/2001	NR	NR
11/11/2001	NR	NR
11/18/2001	NR	NR
11/25/2001	NR	14
12/2/2001	NR	13
12/9/2001	NR	7
12/16/2001	NR	6
12/23/2001	NR	11
12/30/2001	NR	11
1/13/2002	3	9
1/20/2002	NR	7
1/27/2002	1	11
2/3/2002	1	10
2/10/2002	1	8
2/17/2002	1	9
2/24/2002	1	12
3/3/2002	1	14

Table A.3 Continued

Week	New York Times	Publisher's Weekly
3/10/2002	1	7
3/17/2002	1	7
3/24/2002	2	6
3/31/2002	2	10
4/7/2002	2	NR
4/14/2002	2	15
4/21/2002	1	15
4/28/2002	1	NR
5/5/2002	2	NR
5/12/2002	1	NR
5/19/2002	1	NR
5/26/2002	NR	NR
6/2/2002	4	NR
6/9/2002	3	12
6/16/2002	4	4
6/23/2002	3	3
6/30/2002	5	8
7/7/2002	4	9
7/14/2002	4	14
7/21/2002	2	4
7/28/2002	1	6
8/4/2002	1	7
8/11/2002	1	9
8/18/2002	1	7
8/25/2002	1	6
9/1/2002	1	11
9/8/2002	1	11
9/15/2002	1	12
9/22/2002	1	8
9/29/2002	1	8
10/6/2002	1	10
10/13/2002	1	12
10/20/2002	1	1
10/27/2002	1	2
11/3/2002	2	2
11/10/2002	1	3
11/17/2002	1	2
11/24/2002	1	3
12/1/2002	1	2
12/8/2002	1	2
12/15/2002	1	1
12/22/2002	1	1
12/29/2002	2	1
1/5/2003	1	1

Table A.3 Continued

Week	New York Times	Publisher's Weekly
1/12/2003	1	1
1/19/2003	1	1
1/26/2003	1	1
2/2/2003	1	1
2/9/2003	1	1
2/16/2003	1	1
2/23/2003	1	1
3/2/2003	1	2
3/9/2003	1	1
3/16/2003	1	1
3/23/2003	1	1
3/30/2003	1	1
4/6/2003	1	1
4/13/2003	1	1
4/20/2003	1	1
4/27/2003	1	1
5/4/2003	1	1
5/11/2003	1	1
5/18/2003	1	NR
5/25/2003	1	1
6/1/2003	1	1
6/8/2003	1	2
6/15/2003	1	2
6/22/2003	1	2
6/29/2003	1	3
7/6/2003	1	4
7/13/2003	1	4
7/20/2003	1	3
7/27/2003	1	1
8/3/2003	1	1
8/10/2003	1	1
8/17/2003	1	1
8/24/2003	1	5
8/31/2003	1	6
9/7/2003	1	3
9/14/2003	1	2
9/21/2003	1	2
9/28/2003	1	3
10/5/2003	1	5
10/12/2003	1	6
10/19/2003	1	10
10/26/2003	1	9
11/2/2003	1	11
11/9/2003	1	NR

Table A.3 Continued

Week	New York Times	Publisher's Weekly
11/16/2003	1	11
11/23/2003	1	9
11/30/2003	1	8
12/7/2003	1	7
12/14/2003	1	11
12/21/2003	3	13
12/28/2003	5	NR
1/4/2004	NR	11
1/11/2004	2	15
1/18/2004	1	15
1/25/2004	1	14
2/1/2004	1	NR
2/8/2004	1	NR
2/15/2004	NR	NR

Table A.4: Weekly Bestseller Rankings for *The South Beach Diet* by Dr. Arthur Agatston, New York Times and Publisher Weekly Bestseller Lists, April 27, 2003 through December 19, 2004. (Weeks that the book was not ranked are indicated as NR)

Week	New York Times	Publisher's Weekly
4/27/2003	3	9
5/4/2003	3	11
5/11/2003	3	8
5/18/2003	3	3
5/25/2003	1	1
6/1/2003	2	1
6/8/2003	1	1
6/15/2003	3	2
6/22/2003	3	1
6/29/2003	3	3
7/6/2003	1	2
7/13/2003	1	2
7/20/2003	1	2
7/27/2003	1	1
8/3/2003	1	2
8/10/2003	1	1
8/17/2003	1	1
8/24/2003	1	1
8/31/2003	1	1
9/7/2003	1	1
9/14/2003	1	1
9/21/2003	1	1
9/28/2003	2	2
10/5/2003	2	2
10/12/2003	2	2
10/19/2003	2	1
10/26/2003	1	1
11/2/2003	1	1
11/9/2003	1	1
11/16/2003	1	1
11/23/2003	1	1
11/30/2003	1	1
12/7/2003	2	1
12/14/2003	2	1
12/21/2003	2	1
12/28/2003	2	2
1/4/2004	2	3
1/11/2004	2	1
1/18/2004	1	1
1/25/2004	1	1
2/1/2004	1	1

Table A.4 Continued

Week	New York Times	Publisher's Weekly
2/8/2004	1	1
2/15/2004	NR	1
2/22/2004	NR	1
2/29/2004	NR	1
3/7/2004	NR	1
3/14/2004	NR	1
3/21/2004	NR	1
3/28/2004	NR	1
4/4/2004	NR	2
4/11/2004	NR	2
4/18/2004	NR	3
4/25/2004	NR	2
5/2/2004	NR	2
5/9/2004	NR	2
5/16/2004	NR	1
5/23/2004	NR	1
5/30/2004	NR	1
6/6/2004	NR	1
6/13/2004	NR	2
6/20/2004	NR	2
6/27/2004	NR	3
7/4/2004	NR	3
7/11/2004	NR	2
7/18/2004	NR	2
7/25/2004	NR	2
8/1/2004	NR	2
8/8/2004	NR	2
8/15/2004	NR	2
8/22/2004	NR	2
8/29/2004	NR	3
9/5/2004	NR	3
9/12/2004	NR	2
9/19/2004	NR	2
9/26/2004	NR	4
10/3/2004	NR	6
10/10/2004	NR	4
10/17/2004	NR	5
10/24/2004	NR	5
10/31/2004	NR	5
11/7/2004	NR	5
11/14/2004	NR	5
11/21/2004	NR	5
11/28/2004	NR	9
12/5/2004	NR	9

Table A.4 Continued

Week	New York Times	Publisher's Weekly
12/12/2004	NR	11
12/19/2004	NR	NR
1/2/2005	NR	NR
1/9/2005	NR	4
1/16/2005	NR	5
1/23/2005	NR	7
1/30/2005	NR	6
2/6/2005	NR	5
2/13/2005	NR	8

APPENDIX B
NATIONAL AND REGIONAL PURCHASE AND PRICE DATA TABLES

Table B.1: National Data Summary Table, October 1995 through January 2005.

Period	PCGal (gallons)	realP (dollars)	GRP	FieldStaff (0,1)	PDINC (dollars)	POP
10/7/1995	0.235882	5.33	0	1	8337.604	20529000
11/4/1995	0.234942	5.31	0	1	8389.253	20552538
12/2/1995	0.238388	5.29	0	1	8410.214	20572615
12/30/1995	0.249815	5.08	0	1	8445.877	20590154
1/27/1996	0.254739	5.02	0	1	8529.828	20606231
2/24/1996	0.240755	5.34	0	1	8644.814	20622462
3/23/1996	0.24106	5.39	0	1	8747.226	20640231
4/20/1996	0.22872	5.81	0	1	8743.891	20660154
5/18/1996	0.22051	6.14	0	1	8881.256	20679692
6/15/1996	0.213063	6.49	0	1	8938.638	20700923
7/13/1996	0.208569	6.69	0	1	8938.638	20700923
8/10/1996	0.2124	6.58	0	1	8953.082	20722615
9/7/1996	0.21911	6.39	0	1	9063.783	20746462
10/5/1996	0.227018	6.11	0	1	9080.128	20770385
11/2/1996	0.229368	6.05	0	1	9131.694	20793385
11/30/1996	0.23836	5.85	0	1	9190.394	20816308
12/28/1996	0.246006	5.66	0	1	9234.485	20835308
1/25/1997	0.255291	5.41	792	1	9303.213	20853385
2/22/1997	0.242172	5.74	792	1	9379.054	20870615
3/22/1997	0.246105	5.62	792	1	9453.28	20888846
4/19/1997	0.237424	5.83	792	1	9476.631	20909154
5/17/1997	0.229987	6.06	846	1	9500.974	20929077
6/14/1997	0.222404	6.27	846	1	9500.974	20929077
7/12/1997	0.216736	6.43	418	1	9554.04	20950538
8/9/1997	0.224006	6.19	418	1	9608.493	20972846
9/6/1997	0.229789	6	418	1	9685.627	20998000
10/4/1997	0.239324	5.73	1466	1	9756.308	21022462
11/1/1997	0.245295	5.52	1466	1	9827.704	21045615
11/29/1997	0.248743	5.49	1466	1	9889.13	21066692
12/27/1997	0.250614	5.38	1466	1	9930.596	21085538
1/24/1998	0.26717	4.96	1140	1	10045.54	21105000
2/21/1998	0.254533	5.21	1140	1	10129.44	21121308
3/21/1998	0.253086	5.24	1140	1	10210.33	21137154
4/18/1998	0.240253	5.56	892	1	10275.36	21156923

Table B.1 Continued

Period	PCGal (gallons)	realP (dollars)	GRP	FieldStaff (0,1)	PDINC (dollars)	POP
5/16/1998	0.23166	5.82	892	1	10354.24	21177000
6/13/1998	0.22713	6	892	1	10354.24	21177000
7/11/1998	0.220807	6.24	675	1	10415.05	21197923
8/8/1998	0.224004	6.14	675	1	10475.16	21219538
9/5/1998	0.232647	5.96	675	1	10544.04	21242923
10/3/1998	0.239879	5.75	675	1	10589.34	21265769
10/31/1998	0.243559	5.69	996	1	10656.23	21288154
11/28/1998	0.246475	5.74	996	1	10703.13	21309308
12/26/1998	0.241536	6.02	996	1	10722.67	21328385
1/23/1999	0.263193	5.64	1102	1	10796.48	21348769
2/20/1999	0.243697	6.21	1102	1	10838.08	21364231
3/20/1999	0.251803	5.96	1102	1	10890.83	21380154
4/17/1999	0.234231	6.55	460	1	10996.46	21399692
5/15/1999	0.22491	6.82	460	1	11035.18	21420154
6/12/1999	0.225998	6.74	460	1	11035.18	21420154
7/10/1999	0.213586	7.21	705	1	11068.59	21442000
8/7/1999	0.217491	7	705	1	11135.06	21464615
9/4/1999	0.221516	6.92	705	1	11226.61	21488308
10/2/1999	0.229157	6.66	705	1	11293.79	21511692
10/30/1999	0.233851	6.59	1090	1	11422.13	21534769
11/27/1999	0.240837	6.43	1090	1	11512.22	21555462
12/25/1999	0.246141	6.29	1090	1	11625.49	21574385
1/22/2000	0.266125	5.86	1646	1	11832.37	21594308
2/19/2000	0.252596	6.1	1646	1	11988.56	21610692
3/18/2000	0.248196	6.25	1646	1	12168.04	21627538
4/15/2000	0.236459	6.59	225	1	12180.8	21648077
5/13/2000	0.233209	6.66	225	1	12180.8	21648077
6/10/2000	0.222405	7.08	225	1	12242.87	21665846
7/8/2000	0.217233	7.29	1071	1	12368.32	21685385
8/5/2000	0.221836	7.12	1071	1	12514.87	21707077
9/2/2000	0.230606	6.8	1071	1	12553.92	21727846
9/30/2000	0.235342	6.7	1071	1	12665.86	21749692
10/28/2000	0.238919	6.56	1227	1	12718.01	21770462
11/25/2000	0.244476	6.47	1227	1	12720.79	21789923
12/23/2000	0.255845	6.16	1227	1	12723.05	21808615
1/20/2001	0.263861	5.94	1456	1	12918.53	21825846
2/17/2001	0.252403	6.29	1456	1	12995.14	21840923
3/17/2001	0.255536	6.15	1456	1	13050.43	21857538
4/14/2001	0.247452	6.38	360	1	13050.43	21857538
5/12/2001	0.237033	6.65	360	0	13081.22	21875231
6/9/2001	0.222972	7.26	360	0	13153.89	21892615

Table B.1 Continued

Period	PCGal (gallons)	realP (dollars)	GRP	FieldStaff (0,1)	PDINC (dollars)	POP
7/7/2001	0.221395	7.32	66	0	13217.75	21911923
8/4/2001	0.22243	7.21	66	0	13402.85	21930923
9/1/2001	0.226155	7.09	66	0	13643.18	21951615
9/29/2001	0.229343	6.96	66	0	13606.61	21973308
10/27/2001	0.229961	6.9	0	0	13338.7	21993000
11/24/2001	0.229623	6.97	0	0	13346.69	22012538
12/22/2001	0.231413	6.84	0	0	13331.48	22030846
1/19/2002	0.248859	6.3	1648	0	13643.61	22047769
2/16/2002	0.234647	6.75	1648	0	13757.45	22064000
3/16/2002	0.239003	6.64	1648	0	13896.51	22079077
4/13/2002	0.235824	6.68	1258	0	13896.51	22079077
5/11/2002	0.231593	6.78	1258	0	14069.53	22094923
6/8/2002	0.222372	7.15	1258	0	14102.43	22112385
7/6/2002	0.216647	7.35	681	0	14152.01	22130692
8/3/2002	0.220818	7.15	681	0	14135.69	22149308
8/31/2002	0.222628	7.06	681	0	14178.26	22170000
9/28/2002	0.227646	6.94	681	0	14212.12	22191077
10/26/2002	0.223815	7.11	882	0	14258.52	22211385
11/23/2002	0.228077	7.01	882	0	14279.37	22230462
12/21/2002	0.234808	6.77	882	0	14283.5	22247231
1/18/2003	0.245594	6.5	1144	0	14428.98	22263615
2/15/2003	0.236985	6.83	1144	0	14601.68	22280385
3/15/2003	0.233237	6.94	1144	0	14761.24	22296077
4/12/2003	0.219545	7.39	1009	0	14761.24	22296077
5/10/2003	0.216666	7.45	1009	0	14762.45	22312615
6/7/2003	0.208715	7.83	1009	0	14824.41	22330462
7/5/2003	0.205456	7.93	1028	0	14906.15	22349231
8/2/2003	0.20432	7.96	1028	0	15152.07	22368385
8/30/2003	0.209464	7.78	1028	0	15359.27	22389769
9/27/2003	0.2149	7.48	1028	0	15266.59	22411385
11/1/2003	0.213331	7.56	1661	0	15300.8	22432308
11/29/2003	0.219121	7.34	1661	0	15362.21	22452000
12/27/2003	0.234017	6.86	1661	0	15415.77	22469385
1/24/2004	0.240264	6.63	1776	0	15558.28	22486538
2/21/2004	0.221394	7.29	1776	0	15713.42	22503000
3/20/2004	0.216112	7.54	1776	0	15882.71	22518615
4/17/2004	0.207387	7.85	1167	0	16027.75	22534846
5/15/2004	0.204976	7.96	1167	0	16208.14	22551154
6/12/2004	0.199503	8.2	1167	0	16208.14	22551154
7/10/2004	0.194392	8.39	2125	0	16294.47	22570000
8/7/2004	0.195681	8.3	2125	0	16334.05	22588846

Table B.1 Continued

Period	PCGal (gallons)	realP (dollars)	GRP	FieldStaff (0,1)	PDINC (dollars)	POP
9/4/2004	0.199555	8.13	2125	0	16405.58	22609692
10/2/2004	0.202805	8	2125	0	16470.22	22630846
10/30/2004	0.205025	7.97	2125	0	16681.8	22651462
11/27/2004	0.216017	7.51	2125	0	16761.97	22670769
12/25/2004	0.22092	7.33	2125	0	17389.99	22687769
1/22/2005	0.235264	6.97	2125	0	16958.19	22704615

Source: ACNielsen and Florida Department of Citrus

Table B.2: Southern Region Data Summary Table, January 1997 through January 2005.

Period	PCGal (gallons)	realP (dollars)	GRP	FieldStaff (0,1)	PDINC (dollars)	POP
1/25/1997	0.255594	2.043724	0	1	9303.213	7244367
2/22/1997	0.244339	2.14991	0	1	9379.054	7244367
3/22/1997	0.252416	2.036548	0	1	9453.28	7244367
4/19/1997	0.241841	2.144445	0	1	9476.631	7244367
5/17/1997	0.233472	2.234245	0	1	9500.974	7244367
6/14/1997	0.228921	2.284535	0	1	9500.974	7244367
7/12/1997	0.22683	2.294032	0	1	9554.04	7244367
8/9/1997	0.232902	2.216382	0	1	9608.493	7244367
9/6/1997	0.247528	2.064193	0	1	9685.627	7244367
10/4/1997	0.248819	2.026096	0	1	9756.308	7244367
11/1/1997	0.252106	2.000541	0	1	9827.704	7244367
11/29/1997	0.258183	1.934055	0	1	9889.13	7244367
12/27/1997	0.255246	1.955116	0	1	9930.596	7244367
1/24/1998	0.26518	1.836334	0	1	10045.54	7334525
2/21/1998	0.259863	1.851855	0	1	10129.44	7334525
3/21/1998	0.261134	1.842381	0	1	10210.33	7334525
4/18/1998	0.245519	1.991006	0	1	10275.36	7334525
5/16/1998	0.23944	2.032483	792	1	10354.24	7334525
6/13/1998	0.236888	2.059778	792	1	10354.24	7334525
7/11/1998	0.23463	2.097943	792	1	10415.05	7334525
8/8/1998	0.233314	2.112686	792	1	10475.16	7334525
9/5/1998	0.246632	1.997927	846	1	10544.04	7334525
10/3/1998	0.248966	1.982765	846	1	10589.34	7334525
10/31/1998	0.25399	1.925383	418	1	10656.23	7334525
11/28/1998	0.254449	1.982086	418	1	10703.13	7334525
12/26/1998	0.249713	2.060212	418	1	10722.67	7334525
1/23/1999	0.261038	2.001161	1466	1	10796.48	7420650
2/20/1999	0.251758	2.116346	1466	1	10838.08	7420650
3/20/1999	0.258337	2.048241	1466	1	10890.83	7420650
4/17/1999	0.24645	2.14286	1466	1	10996.46	7420650
5/15/1999	0.233875	2.259203	1140	1	11035.18	7420650
6/12/1999	0.234014	2.248776	1140	1	11035.18	7420650
7/10/1999	0.222191	2.381842	1140	1	11068.59	7420650
8/7/1999	0.226885	2.318894	892	1	11135.06	7420650
9/4/1999	0.237477	2.186739	892	1	11226.61	7420650
10/2/1999	0.23978	2.152523	892	1	11293.79	7420650
10/30/1999	0.245667	2.101779	675	1	11422.13	7420650
11/27/1999	0.252858	2.071109	675	1	11512.22	7420650
12/25/1999	0.250783	2.096342	675	1	11625.49	7420650
1/22/2000	0.265785	1.915313	675	1	11832.37	7710450
2/19/2000	0.254928	1.96484	996	1	11988.56	7710450

Table B.2 Continued

Period	PCGal (gallons)	realP (dollars)	GRP	FieldStaff (0,1)	PDINC (dollars)	POP
3/18/2000	0.253829	1.948038	996	1	12168.04	7710450
4/15/2000	0.24176	2.045504	996	1	12180.8	7710450
5/13/2000	0.237301	2.064551	1102	1	12180.8	7710450
6/10/2000	0.228835	2.146959	1102	1	12242.87	7710450
7/8/2000	0.225682	2.165995	1102	1	12368.32	7710450
8/5/2000	0.232305	2.081741	460	1	12514.87	7710450
9/2/2000	0.240599	2.021151	460	1	12553.92	7710450
9/30/2000	0.242684	1.970517	460	1	12665.86	7710450
10/28/2000	0.24526	1.960351	705	1	12718.01	7710450
11/25/2000	0.249825	1.942444	705	1	12720.79	7710450
12/23/2000	0.25372	1.932068	705	1	12723.05	7710450
1/20/2001	0.268257	1.780934	705	1	12918.53	7735842
2/17/2001	0.25671	1.861344	1090	1	12995.14	7735842
3/17/2001	0.261759	1.793358	1090	1	13050.43	7735842
4/14/2001	0.251672	1.881797	1090	1	13050.43	7735842
5/12/2001	0.240881	1.950599	1646	1	13081.22	7735842
6/9/2001	0.231869	2.029308	1646	1	13153.89	7735842
7/7/2001	0.227933	2.081766	1646	1	13217.75	7735842
8/4/2001	0.229926	2.075982	225	1	13402.85	7735842
9/1/2001	0.236743	1.976752	225	1	13643.18	7735842
9/29/2001	0.232947	2.015679	225	1	13606.61	7735842
10/27/2001	0.233045	2.014576	1071	1	13338.7	7735842
11/24/2001	0.230547	2.060049	1071	1	13346.69	7735842
12/22/2001	0.194853	2.070093	1071	1	13331.48	7735842
1/19/2002	0.209327	1.894319	1071	1	13643.61	7833721
2/16/2002	0.197715	1.989012	1227	1	13757.45	7833721
3/16/2002	0.204204	1.910107	1227	1	13896.51	7833721
4/13/2002	0.20103	1.898915	1227	1	13896.51	7833721
5/11/2002	0.194553	1.954153	1456	1	14069.53	7833721
6/8/2002	0.188639	1.983209	1456	1	14102.43	7833721
7/6/2002	0.188886	1.980211	1456	1	14152.01	7833721
8/3/2002	0.192311	1.950613	360	1	14135.69	7833721
8/31/2002	0.196347	1.897468	360	0	14178.26	7833721
9/28/2002	0.192874	1.909566	360	0	14212.12	7833721
10/26/2002	0.189545	1.932599	66	0	14258.52	7833721
11/23/2002	0.193249	1.908292	66	0	14279.37	7833721
12/21/2002	0.194642	1.883318	66	0	14283.5	7833721
1/18/2003	0.20381	1.794421	66	0	14428.98	7935129
2/15/2003	0.198652	1.802143	0	0	14601.68	7935129
3/15/2003	0.193065	1.863694	0	0	14761.24	7935129
4/12/2003	0.183128	1.949915	0	0	14761.24	7935129

Table B.2 Continued

Period	PCGal (gallons)	realP (dollars)	GRP	FieldStaff (0,1)	PDINC (dollars)	POP
5/10/2003	0.182341	1.937717	1648	0	14762.45	7935129
6/7/2003	0.174238	2.051551	1648	0	14824.41	7935129
7/5/2003	0.171346	2.056103	1648	0	14906.15	7935129
8/2/2003	0.171775	2.040635	1258	0	15152.07	7935129
8/30/2003	0.173954	1.992683	1258	0	15359.27	7935129
9/27/2003	0.17637	1.912238	1258	0	15266.59	7935129
11/1/2003	0.176287	1.925893	681	0	15300.8	7935129
11/29/2003	0.182052	1.922662	681	0	15362.21	7935129
12/27/2003	0.191945	1.796618	681	0	15415.77	7935129
1/24/2004	0.189886	1.705539	681	0	15558.28	8037800
2/21/2004	0.177159	1.865056	882	0	15713.42	8037800
3/20/2004	0.170495	1.967981	882	0	15882.71	8037800
4/17/2004	0.166515	1.988053	882	0	16027.75	8037800
5/15/2004	0.162042	1.983987	1144	0	16208.14	8037800
6/12/2004	0.160171	1.969327	1144	0	16208.14	8037800
7/10/2004	0.154254	2.017135	1144	0	16294.47	8037800
8/7/2004	0.157715	2.018863	1009	0	16334.05	8037800
9/4/2004	0.161153	1.971726	1009	0	16405.58	8037800
10/2/2004	0.158417	1.985399	1009	0	16470.22	8037800
10/30/2004	0.1613	1.942906	1028	0	16681.8	8037800
11/27/2004	0.171863	1.828878	1028	0	16761.97	8037800
12/25/2004	0.170697	1.840964	1028	0	17389.99	8037800
1/22/2005	0.177964	1.748462	1028	0	16958.19	8149613

Source: ACNielsen and Florida Department of Citrus

Table B.3: Weighted Average Price (National), based upon Prices and Quantity for various Product Forms

Q1, P1 represents quantity purchased and price per gallon of Frozen Concentrate
 Q2, P2 represents quantity purchased and price per gallon of Not-from-Concentrate
 Q3, P3 represents quantity purchased and price per gallon of Reconsistuted
 Q4, P4 represents quantity purchased and price per gallon of Shelf Stable
 P' represents the weighted price

Period	Q1 (gallons)	P1 (dollars)	Q2 (gallons)	P2 (dollars)	Q3 (gallons)	P3 (dollars)	Q4 (gallons)	P4 (dollars)	P' (dollars)
10/7/1995	18115522	2.72	14862838	4.77	29105802	3.25	867296	4.76	3.48
11/4/1995	17799581	2.68	14707427	4.74	29380341	3.23	885157	4.69	3.46
12/2/1995	18537957	2.70	14877445	4.82	29478207	3.26	861857	4.67	3.44
12/30/1995	19284408	2.76	16719642	4.72	30017489	3.35	846864	4.62	3.31
1/27/1996	19502988	2.78	17006874	4.70	30857505	3.35	872309	4.65	3.25
2/24/1996	18449781	2.79	15581947	4.72	29680932	3.35	831861	4.78	3.45
3/23/1996	18811689	2.80	15478157	4.76	29582026	3.38	810061	4.84	3.46
4/20/1996	16360518	2.97	15311432	4.77	28985433	3.41	772646	4.93	3.72
5/18/1996	16091384	3.00	14725802	4.88	27693681	3.48	770185	5.00	3.92
6/15/1996	14894082	3.13	14382789	4.99	27307588	3.51	753353	5.00	4.14
7/13/1996	14391514	3.19	14229014	4.99	26753822	3.55	753982	4.95	4.27
8/10/1996	14725551	3.15	14512959	4.99	27233703	3.59	747198	4.99	4.19
9/7/1996	15199621	3.12	14921896	4.99	28206504	3.57	766823	4.98	4.04
10/5/1996	16397568	3.02	14860354	5.00	29254054	3.56	786278	5.11	3.87
11/2/1996	16038009	3.06	15645849	4.95	29472797	3.56	844693	4.95	3.82
11/30/1996	17171684	3.07	16201537	4.92	30347237	3.60	782663	5.08	3.69
12/28/1996	17628639	3.04	17179566	4.94	31059321	3.61	765389	5.00	3.57
1/25/1997	17870641	3.01	17850266	4.94	32700397	3.55	786426	5.03	3.40
2/22/1997	16776575	3.00	17137060	4.95	30993984	3.57	798008	5.00	3.60
3/22/1997	17403870	2.91	16877506	4.98	31744808	3.56	804905	5.09	3.51
4/19/1997	15474406	3.00	17385516	4.92	30885673	3.54	790752	5.07	3.64
5/17/1997	14917755	3.03	16398461	4.98	30501313	3.56	756982	5.10	3.79
6/14/1997	13503852	3.09	16957548	4.90	29315477	3.57	734293	5.02	3.92
7/12/1997	13095496	3.07	16087298	4.98	29148468	3.53	698285	4.97	4.01
8/9/1997	14240707	3.00	16603121	4.99	29543043	3.53	687785	5.00	3.86
9/6/1997	14241999	2.95	17767512	4.92	29989911	3.55	726957	5.01	3.73
10/4/1997	15044966	2.92	17772616	4.95	31836812	3.48	750947	5.18	3.55
11/1/1997	15279402	2.90	19044375	4.82	32030071	3.46	757185	5.13	3.42
11/29/1997	15674024	2.95	19360518	4.85	32354732	3.49	733187	5.10	3.40
12/27/1997	15933834	2.86	19519995	4.84	32528810	3.47	713677	5.02	3.34
1/24/1998	16916282	2.80	20782658	4.77	34862163	3.41	741034	4.99	3.07
2/21/1998	15910070	2.77	20299153	4.76	32948889	3.43	730843	5.06	3.22
3/21/1998	16071682	2.72	20008732	4.79	32731249	3.43	732005	5.13	3.23
4/18/1998	13926705	2.84	21070170	4.65	30402540	3.47	679732	5.17	3.42
5/16/1998	13531072	2.86	19187758	4.78	30361963	3.46	695401	5.17	3.58

Table B.3 Continued

Period	Q1 (gallons)	P1 (dollars)	Q1 (gallons)	P1 (dollars)	Q1 (gallons)	P1 (dollars)	Q1 (gallons)	P1 (dollars)	P' (dollars)
6/13/1998	12481789	2.99	20079091	4.71	29264493	3.50	703608	5.11	3.68
7/11/1998	12199541	3.01	19355119	4.86	28614020	3.51	679775	5.06	3.83
8/8/1998	12362310	2.98	20199302	4.80	28553160	3.53	677579	5.07	3.76
9/5/1998	13013193	3.00	20023371	4.92	30483383	3.52	727468	5.19	3.65
10/3/1998	13573235	2.91	21086278	4.85	30872138	3.56	783971	5.29	3.51
10/31/1998	13775645	2.91	21567081	4.82	31233617	3.60	827560	5.42	3.47
11/28/1998	13690475	3.01	23106130	4.88	30712190	3.68	769837	5.33	3.50
12/26/1998	13685924	3.07	22163196	5.11	30398326	3.77	723126	5.26	3.67
1/23/1999	15692806	3.04	22877812	5.33	33705870	3.84	768598	5.27	3.43
2/20/1999	13159783	3.18	22440122	5.29	31342365	3.93	740984	5.40	3.77
3/20/1999	14432589	3.08	22728666	5.36	32062344	3.87	762961	5.35	3.61
4/17/1999	12069086	3.24	22136841	5.38	30264340	3.91	691976	5.39	3.94
5/15/1999	11837114	3.22	20989286	5.45	29120001	3.88	682472	5.45	4.11
6/12/1999	11446992	3.25	21862879	5.32	28955566	3.87	666348	5.40	4.06
7/10/1999	10680259	3.28	20871496	5.41	27351092	3.91	633428	5.26	4.34
8/7/1999	11013151	3.21	21261000	5.34	27771501	3.88	643146	5.25	4.20
9/4/1999	11125603	3.24	22197423	5.33	27893226	3.91	663725	5.33	4.14
10/2/1999	11829532	3.17	22257256	5.37	29253909	3.85	743546	5.38	3.96
10/30/1999	11871633	3.24	22955773	5.37	29922187	3.89	717546	5.47	3.92
11/27/1999	11971622	3.25	23854824	5.38	30983088	3.92	677982	5.47	3.82
12/25/1999	12838831	3.24	23526833	5.38	31989553	3.93	679297	5.38	3.74
1/22/2000	13289166	3.23	25056891	5.50	35620083	3.93	741975	5.33	3.47
2/19/2000	12463941	3.18	25010559	5.31	32836819	3.91	652847	5.45	3.59
3/18/2000	12689339	3.11	24492604	5.36	31931497	3.92	668888	5.45	3.65
4/15/2000	10998201	3.18	23744583	5.40	31159724	3.90	642974	5.48	3.85
5/13/2000	11169937	3.11	23785771	5.36	30024298	3.93	650934	5.50	3.89
6/10/2000	10225349	3.27	22300278	5.44	29483511	3.91	632480	5.42	4.13
7/8/2000	9765904	3.29	22792081	5.32	28086874	3.98	595197	5.31	4.23
8/5/2000	10067064	3.24	23610343	5.32	28377126	3.97	545718	5.41	4.12
9/2/2000	10424244	3.21	23903063	5.34	30248641	3.92	561622	5.42	3.94
9/30/2000	10673240	3.24	24639975	5.34	30631117	3.91	597726	5.54	3.86
10/28/2000	11234861	3.11	24934098	5.33	30816222	3.94	632854	5.43	3.77
11/25/2000	10984744	3.22	26508820	5.26	31171663	3.99	587318	5.45	3.72
12/23/2000	11834184	3.22	27031732	5.25	33086129	3.98	583186	5.39	3.54
1/20/2001	12219115	3.09	27714469	5.29	34369484	3.94	563832	5.35	3.39
2/17/2001	10812600	3.16	27074436	5.30	33192118	3.97	586082	5.45	3.58
3/17/2001	11437156	3.11	27241784	5.30	33317775	3.91	613290	5.26	3.49
4/14/2001	10655497	3.12	27432833	5.27	31651548	3.95	573115	5.40	3.62
5/12/2001	9968102	3.14	26409870	5.30	30450726	3.88	578369	5.40	3.76
6/9/2001	9146949	3.25	25873928	5.36	27878761	3.99	559062	5.31	4.09
7/7/2001	9015329	3.25	25444299	5.35	28035258	4.00	570563	5.25	4.11

Table B.3 Continued

Period	Q1 (gallons)	P1 (dollars)	Q1 (gallons)	P1 (dollars)	Q1 (gallons)	P1 (dollars)	Q1 (gallons)	P1 (dollars)	P' (dollars)
8/4/2001	8966972	3.23	25773454	5.36	28024131	3.94	650771	5.31	4.06
9/1/2001	9034527	3.23	27015071	5.26	27802414	4.00	686043	5.38	3.99
9/29/2001	9847287	3.14	26900440	5.28	28001867	3.98	762933	5.45	3.91
10/27/2001	9932741	3.12	26409531	5.33	28640650	3.96	764867	5.38	3.88
11/24/2001	9643258	3.21	27609632	5.28	27718793	4.02	737803	5.34	3.93
12/22/2001	9565773	3.24	26669617	5.36	29313578	3.90	727821	5.25	3.87
1/19/2002	9940640	3.18	28801491	5.27	31847279	3.90	738674	5.14	3.56
2/16/2002	8936535	3.23	27245876	5.34	30396591	3.89	725399	5.42	3.80
3/16/2002	9449581	3.17	28289785	5.29	30147125	3.92	713920	5.43	3.71
4/13/2002	8726171	3.17	28995836	5.22	29216675	3.89	749514	5.32	3.73
5/11/2002	8195658	3.21	29036852	5.20	28591344	3.81	697477	5.38	3.77
6/8/2002	7832437	3.27	28425986	5.19	26969542	3.89	695285	5.29	3.98
7/6/2002	7495590	3.31	26710199	5.29	27470650	3.83	652563	5.32	4.09
8/3/2002	7546046	3.28	27404564	5.20	27962818	3.83	669003	5.25	3.97
8/31/2002	7621707	3.25	27913733	5.14	27985507	3.81	642777	5.38	3.91
9/28/2002	7755301	3.31	28812836	5.15	28413213	3.80	690933	5.32	3.83
10/26/2002	7976950	3.24	27451520	5.23	28518370	3.87	679277	5.27	3.92
11/23/2002	7842031	3.33	28829249	5.18	28600322	3.88	641607	5.40	3.86
12/21/2002	8335439	3.32	30032182	5.16	28897968	3.88	644300	5.26	3.74
1/18/2003	8547714	3.31	31676891	5.15	30148187	3.90	708769	5.11	3.58
2/15/2003	7862600	3.36	30896255	5.23	29221443	3.88	661136	5.36	3.73
3/15/2003	7917715	3.32	30294326	5.23	28731875	3.85	659516	5.32	3.77
4/12/2003	7533346	3.31	28317696	5.30	27150230	3.84	633547	5.38	4.01
5/10/2003	7110950	3.34	28685601	5.18	26377754	3.87	672615	5.23	4.05
6/7/2003	6596185	3.42	28062740	5.25	25298323	3.92	631884	5.27	4.27
7/5/2003	6364537	3.41	27706360	5.27	25014338	3.89	607895	5.33	4.32
8/2/2003	6120804	3.47	27736487	5.28	24925727	3.83	630946	5.11	4.33
8/30/2003	6332240	3.46	28984154	5.23	25042003	3.84	609569	5.27	4.21
9/27/2003	6665253	3.35	30350813	5.16	24933038	3.80	661593	5.36	4.04
11/1/2003	6210344	3.41	29578858	5.14	25751899	3.82	670388	5.31	4.08
11/29/2003	6704672	3.38	31854747	5.04	24745095	3.90	651637	5.30	3.98
12/27/2003	7292658	3.39	33516391	5.11	26951457	3.86	596356	5.26	3.72
1/24/2004	7422189	3.31	33268128	5.15	28899513	3.79	645350	5.21	3.58
2/21/2004	6045455	3.41	30574559	5.18	27577364	3.78	569126	5.28	3.91
3/20/2004	6315690	3.30	30603978	5.20	25761184	3.87	584119	5.39	4.02
4/17/2004	5789307	3.37	29436292	5.24	24999095	3.78	529877	5.35	4.17
5/15/2004	5709321	3.37	28570776	5.25	25263157	3.75	548635	5.32	4.21
6/12/2004	5547913	3.40	28277807	5.20	24104911	3.79	556701	5.18	4.33
7/10/2004	5346117	3.40	27574279	5.20	23608664	3.74	507404	5.24	4.43
8/7/2004	5397558	3.38	27303052	5.19	24252901	3.74	509121	5.10	4.38
9/4/2004	5434543	3.39	28844346	5.10	23894110	3.77	481414	5.41	4.29

Table B.3 Continued

Period	Q1 (gallons)	P1 (dollars)	Q1 (gallons)	P1 (dollars)	Q1 (gallons)	P1 (dollars)	Q1 (gallons)	P1 (dollars)	P' (dollars)
10/2/2004	5553085	3.36	28489574	5.23	25103984	3.71	518790	5.54	4.21
10/30/2004	5357433	3.39	28771219	5.18	25706906	3.74	537969	5.47	4.18
11/27/2004	5779990	3.34	31139401	5.11	26201467	3.75	543579	5.45	3.93
12/25/2004	6091988	3.36	32031871	5.14	26520730	3.75	513819	5.33	3.85
1/22/2005	6210554	3.37	32220221	5.38	30462397	3.71	547365	5.36	3.65

Source: ACNielsen and Florida Department of Citrus

Table B.4: Weighted Average Price (Regional), based upon Prices and Quantity for various Product Forms

Q1, P1 represents quantity purchased and price per gallon of Frozen Concentrate
 Q2, P2 represents quantity purchased and price per gallon of Not-from-Concentrate
 Q3, P3 represents quantity purchased and price per gallon of Reconstituted
 Q4, P4 represents quantity purchased and price per gallon of Shelf Stable
 P' represents the weighted price

Period	Q1 (gallons)	P1 (dollars)	Q2 (gallons)	P2 (dollars)	Q3 (gallons)	P3 (dollars)	Q4 (gallons)	P4 (dollars)	P' (dollars)
1/25/1997	4832151	3.10	4956261	4.94	13838421	3.30	444193	4.56	3.61898
2/22/1997	4587130	3.08	4971564	4.91	13019114	3.37	433282	4.60	3.667161
3/22/1997	4853168	2.91	5046366	4.88	13432955	3.33	439209	4.61	3.594172
4/19/1997	4204335	3.04	5022428	4.91	13114315	3.32	434731	4.60	3.647426
5/17/1997	4037186	3.09	4686654	4.96	12833875	3.32	429908	4.58	3.654412
6/14/1997	3771715	3.16	4810243	4.89	12557499	3.34	419571	4.47	3.676599
7/12/1997	3656060	3.14	4774900	4.94	12523787	3.31	407386	4.48	3.665907
8/9/1997	3910314	3.09	4772265	4.99	12831817	3.27	419536	4.44	3.634581
9/6/1997	4102225	2.99	5203949	4.91	13571800	3.28	433395	4.46	3.616329
10/4/1997	4093039	2.93	5172751	4.92	13729321	3.23	437873	4.53	3.576948
11/1/1997	4209765	2.91	5257339	4.89	13833443	3.27	442007	4.51	3.587731
11/29/1997	4308520	2.95	5638039	4.76	13921141	3.23	447124	4.49	3.558649
12/27/1997	4353200	2.87	5695992	4.74	13542537	3.26	446532	4.42	3.561793
1/24/1998	4385387	2.84	6085627	4.78	14368832	3.20	444740	4.40	3.538022
2/21/1998	4370405	2.75	5937756	4.75	14039036	3.18	430469	4.48	3.503194
3/21/1998	4190017	2.81	6183589	4.70	14081057	3.18	444162	4.48	3.519511
4/18/1998	3608375	2.95	6111972	4.72	13264264	3.23	425330	4.51	3.597077
5/16/1998	3601886	2.97	5771778	4.75	13030178	3.19	426486	4.49	3.5764
6/13/1998	3535758	3.00	5875954	4.71	12748899	3.21	426384	4.44	3.591326
7/11/1998	3431172	3.03	5779565	4.82	12738631	3.23	422326	4.41	3.631078
8/8/1998	3449595	3.00	6069204	4.72	12306280	3.29	421149	4.36	3.655427
9/5/1998	3683289	2.98	6212263	4.81	13182291	3.27	438256	4.46	3.653302
10/3/1998	3683593	2.93	6156832	4.81	13450287	3.31	447917	4.58	3.660655
10/31/1998	3685415	2.93	6765782	4.64	13310396	3.31	456042	4.61	3.650664
11/28/1998	3698946	3.01	6784911	4.89	13328933	3.39	448656	4.59	3.777324
12/26/1998	3646512	3.07	6584327	5.02	13146454	3.46	432593	4.56	3.848489
1/23/1999	4043125	3.06	6846558	5.18	13855499	3.60	436756	4.65	3.960082
2/20/1999	3517137	3.22	6793068	5.25	13545788	3.65	430668	4.74	4.053305
3/20/1999	3705278	3.18	6794828	5.36	13978119	3.61	443172	4.69	4.039647
4/17/1999	3302785	3.24	6926910	5.31	13124046	3.63	420871	4.71	4.085003
5/15/1999	3141142	3.29	6454672	5.33	12560229	3.61	405556	4.71	4.077225
6/12/1999	3178474	3.24	6559630	5.29	12438452	3.62	398446	4.64	4.068025
7/10/1999	2961070	3.28	6438627	5.27	11655961	3.65	378728	4.58	4.101009
8/7/1999	2965383	3.30	6622067	5.28	11913976	3.62	385843	4.55	4.094966
9/4/1999	3216186	3.20	7171535	5.15	12125655	3.63	395674	4.65	4.061095
10/2/1999	3175254	3.16	6880267	5.29	12663773	3.58	411932	4.79	4.052723
10/30/1999	3249261	3.18	7120901	5.25	12914962	3.60	413979	4.78	4.059541

Table B.4 Continued

Period	Q1 (gallons)	P1 (dollars)	Q2 (gallons)	P2 (dollars)	Q3 (gallons)	P3 (dollars)	Q4 (gallons)	P4 (dollars)	P' (dollars)
11/27/1999	3196849	3.31	7695299	5.24	13094626	3.65	406073	4.79	4.126796
12/25/1999	3338318	3.32	7182673	5.25	13259213	3.68	412447	4.74	4.111134
1/22/2000	3420491	3.32	7878914	5.36	14914995	3.70	426750	4.78	4.159103
2/19/2000	3243106	3.29	8097245	5.17	13829444	3.70	383092	4.80	4.130808
3/18/2000	3317196	3.19	7776842	5.29	13961814	3.67	386864	4.82	4.120047
4/15/2000	2992780	3.21	7546295	5.32	13309489	3.66	384456	4.79	4.137761
5/13/2000	2993556	3.16	7509684	5.25	12911978	3.63	370851	4.82	4.104173
6/10/2000	2831332	3.26	6951388	5.35	12788721	3.59	366044	4.79	4.101964
7/8/2000	2722562	3.27	7238235	5.22	12286020	3.63	374649	4.66	4.115807
8/5/2000	2879633	3.17	7669027	5.14	12381931	3.64	354739	4.74	4.092431
9/2/2000	2899904	3.23	7772346	5.20	13081714	3.63	362703	4.79	4.107746
9/30/2000	2910613	3.19	7867432	5.19	13187345	3.57	360243	4.79	4.069551
10/28/2000	2915619	3.18	8132038	5.18	13160082	3.63	376091	4.77	4.105648
11/25/2000	2952796	3.26	8465221	5.15	13249615	3.68	373742	4.76	4.140172
12/23/2000	3142695	3.25	8428113	5.21	13487447	3.73	373623	4.69	4.173163
1/20/2001	3212608	3.19	8955279	5.19	14437385	3.65	372266	4.68	4.119595
2/17/2001	2935654	3.17	8650622	5.22	13867609	3.67	362446	4.75	4.14915
3/17/2001	3006961	3.16	8891641	5.21	14060467	3.58	364978	4.74	4.096035
4/14/2001	2791427	3.20	8894870	5.19	13263979	3.63	359383	4.73	4.144788
5/12/2001	2690898	3.17	8441959	5.25	12738357	3.59	353210	4.72	4.138873
6/9/2001	2506917	3.26	8455399	5.25	12013748	3.60	342086	4.67	4.176246
7/7/2001	2524896	3.23	8175767	5.28	11870437	3.67	351183	4.66	4.211689
8/4/2001	2545056	3.21	8800088	5.13	11378779	3.74	398802	4.73	4.229205
9/1/2001	2584983	3.16	8730159	5.16	12064263	3.61	428920	4.83	4.15513
9/29/2001	2639645	3.13	8744744	5.13	11584169	3.69	457954	4.85	4.187244
10/27/2001	2489878	3.17	8506013	5.24	11982995	3.62	457497	4.82	4.181437
11/24/2001	2523049	3.19	8820324	5.23	11390300	3.68	451545	4.82	4.236324
12/22/2001	2496134	3.24	7954134	5.37	12221940	3.61	448596	4.72	4.194217
1/19/2002	2592221	3.23	9009513	5.27	13033560	3.60	423443	4.82	4.180248
2/16/2002	2451943	3.17	8402783	5.36	12688927	3.64	419166	4.91	4.219015
3/16/2002	2326026	3.21	9196741	5.27	12653963	3.60	428947	4.89	4.208972
4/13/2002	2305240	3.17	9489531	5.13	12173435	3.57	448897	4.83	4.162057
5/11/2002	2230308	3.20	9212152	5.10	11587128	3.53	430613	4.88	4.138176
6/8/2002	2122711	3.25	9251299	5.10	11363548	3.52	424309	4.81	4.150871
7/6/2002	2088868	3.25	8758417	5.20	11797252	3.46	421575	4.80	4.125095
8/3/2002	2097199	3.23	9202484	5.05	11664266	3.52	427298	4.75	4.11677
8/31/2002	2222839	3.19	9062954	5.17	12143141	3.45	407328	4.88	4.106038
9/28/2002	2139708	3.23	9190136	5.13	12120878	3.52	416351	4.74	4.134197
10/26/2002	2202102	3.17	9030208	5.20	12068387	3.56	406950	4.75	4.171999
11/23/2002	2130298	3.26	9354670	5.15	12058729	3.52	385863	4.83	4.154766
12/21/2002	2284583	3.26	9569174	5.11	12163166	3.57	392830	4.74	4.161822
1/18/2003	2321021	3.22	10097298	5.12	12639959	3.57	428076	4.76	4.174002
2/15/2003	2226357	3.24	10364534	5.18	12284263	3.57	404106	4.83	4.219862

Table B.4 Continued

Period	Q1 (gallons)	P1 (dollars)	Q2 (gallons)	P2 (dollars)	Q3 (gallons)	P3 (dollars)	Q4 (gallons)	P4 (dollars)	P' (dollars)
3/15/2003	2143333	3.25	9869052	5.16	12003660	3.60	374887	4.81	4.218264
4/12/2003	2091741	3.25	9209699	5.25	11482801	3.52	367992	4.86	4.205793
5/10/2003	1987929	3.24	9501692	5.05	11389359	3.56	384966	4.83	4.164257
6/7/2003	1840719	3.29	9325317	5.15	10688956	3.58	365804	4.80	4.23358
7/5/2003	1811608	3.26	9440183	5.13	10431413	3.58	388240	4.81	4.234571
8/2/2003	1706220	3.40	9420845	5.15	10619152	3.49	365544	4.71	4.206548
8/30/2003	1868996	3.37	9680168	5.14	10705390	3.52	391582	4.69	4.223192
9/27/2003	1908122	3.23	9978405	5.07	10806771	3.48	398518	4.77	4.166129
11/1/2003	1727412	3.33	10252529	5.01	10826117	3.53	394190	4.85	4.188509
11/29/2003	1907272	3.29	10597201	4.97	10535411	3.60	415612	4.76	4.215985
12/27/2003	2026698	3.31	11223361	5.06	11621565	3.60	364759	4.71	4.238218
1/24/2004	2135520	3.19	11038836	5.10	12419555	3.51	400931	4.72	4.179903
2/21/2004	1691499	3.39	10165432	5.18	11843559	3.52	332370	4.68	4.227468
3/20/2004	1683357	3.32	10287137	5.18	10665262	3.65	340144	4.79	4.325082
4/17/2004	1753435	3.25	9952984	5.16	10323595	3.58	310394	4.75	4.274705
5/15/2004	1667440	3.31	9504968	5.20	10577882	3.49	321566	4.69	4.229332
6/12/2004	1674755	3.27	9391569	5.15	10633273	3.47	328386	4.60	4.185196
7/10/2004	1601506	3.34	9496647	5.12	10096862	3.46	300488	4.62	4.201786
8/7/2004	1581403	3.31	9416564	5.09	10119902	3.45	285283	4.61	4.176426
9/4/2004	1600001	3.34	10004811	5.05	10114202	3.47	279103	4.78	4.195682
10/2/2004	1602971	3.31	9563131	5.13	10471085	3.49	290113	4.92	4.212197
10/30/2004	1551965	3.35	10013831	5.03	10449308	3.52	309327	4.83	4.206309
11/27/2004	1704856	3.29	10538553	5.03	11039831	3.52	315177	4.83	4.193761
12/25/2004	1737620	3.34	10634407	5.03	11068611	3.56	291156	4.71	4.21712
1/22/2005	1734389	3.36	11153964	5.23	12027754	3.57	319150	4.72	4.302428

Source: ACNielsen and Florida Department of Citrus

APPENDIX C
SAS PROGRAM USED TO ESTIMATE DEMAND

SAS Program Used to Estimate U.S. Demand for Orange Juice

```
OPTIONS PS=74 MISSING='.' NODATE NONUMBER; TITLE ' ';
PROC IMPORT
DATAFILE="E:/ANALYSIS/ndata.CSV"
OUT=OJN DBMS=CSV REPLACE;

*TRANSFORM VARIABLES
Per Capita Income and Lagged Dependent Variable
PROC CONTENTS;
DATA OJN; SET OJN; PCINC=PDINC/POP; PCGAL1=LAG(PCGAL);

*CORRELATION ANALYSIS
PROC CORR; VAR PCGAL REALP PCINC NEWSART MAGART GRP FieldStaff
PCGAL1;

*CALCULATE MEANS FOR ELASTICITY
PROC MEANS MEAN MIN MAX N; VAR PCGAL REALP PCINC NEWSART
MAGART GRP FieldStaff;
OUTPUT OUT=MM MEAN=MPCGAL MREALP MPCINC MNEWSART
MMAGART MGRP MStaff;
DATA MM; SET MM; KEEP MPCGAL MREALP MPCINC MNEWSART
MMAGART MGRP MStaff;

*BASE MODEL ANALYSIS
All Variables, test for autocorrelation
PROC AutoREG DATA=OJN OUTEST=BNBase;
NBBase: MODEL PCGAL = REALP PCINC NEWSART MAGART GRP
FieldStaff SDM2 SDM3 SDM4 SDM5 SDM6 SDM7
SDM8 SDM9 SDM10 SDM11 SDM12 SDM13/nlag=1;

*MODEL WITHOUT INSIGNIFICANT VARIABLES
Significant Variables from Base Model only, test for autocorrelation
PROC AutoREG DATA=OJN OUTEST=BNBase;
NBBase: MODEL PCGAL = REALP PCINC NEWSART
FieldStaff SDM2 SDM3 SDM4 SDM5 SDM6 SDM7
SDM8 SDM9 SDM10 SDM11 SDM12 SDM13/nlag=1;
```

***FINAL MODEL**

Significant Variables from Base Model only and Cochran-Orcutt Modification, test for autocorrelation

```

PROC AUTOREG DATA=OJN OUTEST=BNMOD2;
NMod2: MODEL PCGAL = PCGAL1 REALP PCINC NEWSART
      FieldStaff SDM2 SDM3 SDM4 SDM5 SDM6 SDM7
      SDM8 SDM9 SDM10 SDM11 SDM12 SDM13/LAGDEP=PCGAL1;

```

***ELASTICITIES AT THE MEAN**

```

DATA BNMOD2; SET BNMOD2; KEEP REALP PCINC NEWSART FieldStaff;
RENAME REALP=B2 PCINC=B3 NEWSART=B4 FieldStaff=B5;
DATA BM2; MERGE BNMOD2 MM;
PELAS=B2*MREALP/MPCGAL; IELAS=B3*MPCINC/MPCGAL;
NELAS=B4*MNEWSART/MPCGAL; FELAS=B5*MStaff/MPCGAL;
LABEL PELAS=PRICE ELASTICITY IELAS=INCOME ELASTICITY
      NELAS=NEWS ART ELASTICITY FELAS=Field Staff Elasticity;
PROC PRINT LABEL; VAR PELAS IELAS NELAS FELAS;
RUN;

```

SAS Program Used to Estimate Southern Region Demand for Orange Juice

```

OPTIONS PS=74 MISSING='.' NODATE NONUMBER; TITLE ' ';
PROC IMPORT
DATAFILE="E:/ANALYSIS/rdata2.CSV"
OUT=OJR DBMS=CSV REPLACE;

*TRANSFORM VARIABLES
Per Capita Income and Lagged Dependent Variable
PROC CONTENTS;
DATA OJR; SET OJR; PCINC=rPDINC/POP; PCGAL1=LAG(PCGAL);

*CORRELATION ANALYSIS
PROC CORR; VAR PCGAL REALP PCINC REGART GRP FieldStaff PCGAL1;

*CALCULATE MEANS FOR ELASTICITY
PROC MEANS MEAN MIN MAX N; VAR PCGAL REALP PCINC REGART
FieldStaff NATART ART;
OUTPUT OUT=MM MEAN=MPCGAL MREALP MPCINC MREGART MFIELDStaff
MNATART MART;
DATA MM; SET MM; KEEP MPCGAL MREALP MPCINC MREGART
MFIELDStaff MNATART MART;

*FINAL MODEL
Significant Variables from Base Model only and Cochran-Orcutt Modification, test for autocorrelation
PROC AUTOREG DATA=OJR OUTEST=BRMOD2;
BRMod2: MODEL PCGAL = PCGAL1 REALP PCINC REGART FieldStaff
SDM2 SDM3 SDM4 SDM5 SDM6 SDM7
SDM8 SDM9 SDM10 SDM11 SDM12 SDM13/LAGDEP=PCGAL1;

*MODEL #2: ELASTICITY AT THE MEAN
DATA BRMOD2; SET BRMOD2; KEEP REALP PCINC REGART FieldStaff;
RENAME REALP=B2 PCINC=B3 REGART=B4 FieldStaff=B5;
DATA BM2; MERGE BRMOD2 MM;
PELAS=B2*MREALP/MPCGAL; IELAS=B3*MPCINC/MPCGAL;
NELAS=B4*MREGART/MPCGAL; FELAS=B5*MStaff/MPCGAL;
LABEL PELAS=PRICE ELASTICITY IELAS=INCOME ELASTICITY
NELAS=NEWS ART ELASTICITY FELAS=Field Staff Elasticity;
PROC PRINT LABEL; VAR PELAS IELAS NELAS FELAS;
RUN;

```

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BIOGRAPHICAL SKETCH

Leigh Ann Love is the daughter of William and Mary Love of Calipatria, California. She is an active member of the Oak Park Baptist Church and currently serves as the Director of Youth Ministry.

Leigh Ann graduated with her Bachelor of Science degree in agribusiness from California Polytechnic State University San Luis Obispo in 2003, with an emphasis in agricultural marketing. She then began the Master of Science in food and resource economics at the University of Florida and has taken courses relating to Agricultural Marketing and Agribusiness. She remains an active member of the Food Research Distribution Society, Alpha Zeta Alumni Association, and the American Agricultural Economics Association. Leigh Ann was elected AAEA Graduate Student Section Chair-Elect for 2005-2006.