Fall 12-30-2017

Consumer Profiles of Protein Supplement Users

Freya m. Block
Southern Illinois University Carbondale, fblock@siu.edu

CONSUMER PROFILES OF PROTEIN SUPPLEMENT USERS

by

Freya Block

B.S., Southern Illinois University, 2016

A Research Paper
Submitted in Partial Fulfillment of the Requirements for the
Master of Science

Department of Agribusiness Economics
in the Graduate School
Southern Illinois University Carbondale
December 2017

RESEARCH PAPER APPROVAL

CONSUMER PROFILES OF PROTEIN SUPPLEMENT USERS

By

Freya Block

A Research Paper Submitted in Partial

Fulfillment of the Requirements

for the Degree of

Master of Science

in the field of Agribusiness Economics

Approved by:

Jebaraj Asirvatham, Chair

Graduate School
Southern Illinois University Carbondale
October 20th, 2017

AN ABSTRACT OF THE RESEARCH PAPER OF

FREYA BLOCK, for the Master of Science degree in AGRIBUSINESS ECONOMICS, presented on OCTOBER 20th 2017, at Southern Illinois University Carbondale.

TITLE: CONSUMER PROFILES OF PROTEIN SUPPLEMENT USERS

MAJOR PROFESSOR: Dr. Jebara Asirvatham

In America, the advertisement and product availability of high protein foods, food products, and supplements is ever increasing. The associated benefits of a higher protein diet range from higher levels of satiety to increased athletic performance and recovery. Although the majority of previous studies focus on athletic performance and recovery it is important to have an understanding on the growing market to other consumers. This study will attempt to understand and determine the consumer profiles and characteristics of those who consume protein supplements. Socio-demographic and physical activity variables of consumers using supplements from the Centers of Disease Control National Health and nutrition Survey will be used in OLS estimation regression analysis will be used to show the effects of age, annual household income, education, and number of days of activity at least 60 minutes on the amount of protein supplement used. Using two different models, this study found physical activity did not have a linear relationship with protein supplement consumption, age has a negative relationship with protein supplement use.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

The foods people eat are ever changing. From the growing availability for consumers to get foods from around the world and advances in technology, food is becoming more and more diverse. Along with this, health and fitness is becoming more main stream. Restaurants are posting calorie and nutritional information up front for easy access for consumers. Companies like Panera Bread Company and Chipotle market themselves as healthy and fresh. Grocery stores are increasingly providing more and more health food sections and have growing supplement isles. Marketers are interested in consumer's tastes, wants, and needs to develop food and food products that consumers will buy. With this information they also can use the information to direct efforts toward different consumer groups most likely to buy their products for marketing campaigns and advertisements.

Supplement companies have taken this same path. Because of the advancement in technology in recent years, the supplement industry is stronger than ever and has become a billion-dollar industry. The industry was reported to have revenues of 3.3 billion dollars in 1990(3) In more recent years, the industry has grown to a whopping 30 billion dollar industry in 2013 (12) and 3 million people were reported to use or have used supplements in the United States.(5)

Now they have a broader consumer group because they are able to improve taste and texture without taking away from a supplements active ingredients. In this way, they have been able to capture consumer groups outside of those aiming to prevent illness or ailment. The supplement companies make claims about their supplements that may not have research to support them. In recent years, there has been a recycling of old home remedies, alternative

medicine, and other products into the supplement market. These and other nutritional supplements claim to increase energy, fight disease, and improve health. Marketers also maximize on the convenience and ease of using supplement products rather than putting focus on finding and making the right food choices to get the same or better result that. In this study, I model the association between protein supplement intake and socio-demographic characteristics and physical activity levels. Creating a consumer profile would also help estimate potential demand for protein supplement.

Studying protein in this industry is important because it is an essential macro nutrient. There are numerous studies showing an increased need for protein in active individual's diets. For endurance and strength athletes, protein requirements in their diet can be double the recommendations for typical adults. The normal recommended daily protein intake is .8g/kg per day but individuals regularly training and trying to build muscles need as much as 1.8g/kg per day to most efficiently reach their goals(2). There are numerous studies looking at whether these supplements are really helpful or harmful and most look at general supplements. Few studies focus on supplemental protein consumption and of those who do focus on the factors of athletes choosing to use protein supplements.

Globally, protein is the most limited macronutrient. Of the world's population, almost 14% suffer from malnutrition. African and South Asian countries especially suffer from inadequate protein intake which contributes to impaired growth in young children. (14)With the world population steadily increasing the need for innovative and sustainable food technology is larger than ever. Protein supplementation could be of great help to improving the lives of millions of children around the world suffering from nutritional deficiencies.

1.1 Statement of Problem

The purpose of this study is to determine consumer profiles of protein supplement users and the relationship between key variables and protein supplement use. Specifically, the consumer demographic characteristics in this study include age, education level, household income, number of dietary supplements taken, and physical activity including days active over 60 min and minutes of vigorous and moderate activity. Regression analysis, specifically OLS estimation, will be implemented in this paper to determine the variable most effective on protein supplement use in consumers.

Motivations for this study come from the increasing rate of supplement sales especially that of protein, a macro nutrient easily accessible in regular food intake. Protein is largely studied in sports nutrition fields and widely used by athletes but there is increasing marketing campaigns by supplement companies to the regular public for protein supplements and product including supplemental protein. Research on the consumer profiles of likely supplement users would be beneficial to marketers and supplement producers. It could also be used for potential intervention of those using supplements that may be harmful.

1.2 Limitations

In this study, limitations arise because the data is survey based. The results are based in the honesty and recall of participants. Due to the nature of survey questions about physical activity, the data may be skewed. The interpretation of what physical activity can vary between person to person and even more so when specified by moderate and vigorous. Although survey consisted of a 4181 participants, the sample used only 60 who reported consuming protein supplements and all other variables.

CHAPTER 2

REVIEW OF LITERATURE

2.1 Supplement Advertising

As technology and media has evolved, the average American has not only gained access to more information than ever before, they have also gained a much louder voice. People not only have readily available information at the fingertips but also access to spreading the information they deem important through social media. This especially has had an impact on how people view their health. Now more than ever, Americans are being active in their own health care and many times taking nutritional supplements is a part of this new role. While people can connect to a much larger audience so can advertisers, giving supplement companies another avenue to reach consumers they had not previously had. Although there is federal law that prohibits dietary supplements to have medical claims on the label, supplement companies use advertisements to bypass the hurdle (10).

In a study of 225 pharmacy customers, dietary supplement use was attributed to consumers wanting to improve health and gain peace of mind. It found that consumers who take a variety of supplements have different behaviors than those only taking a multivitamin. The study concluded that the media had the most effect on those consumers who took a variety of supplements but that they were less likely to recommend similar supplement consumption to others. In addition, consumers tend to take the self-educated approach towards dietary supplements often unknowingly using non-credible sources. (9)

2.2 Nutrition

Healthy diet is arguably the best prevention for disease and the biggest factor in a person's overall health. In America, the result of poor diets has left nearly half of the adult

population with one chronic disease or more (13). The high rate of diet related diseases in the U.S. effects more than just the people who have them. The cost of health care has increased, wages are lost and productivity has declined due to the vast number of people struggling with diseases that take away from the rest of their lives. (13). One study(8) of 4680 men and women around the world found that a diet rich in non-meat protein had a significant effect lowering blood pressure in participants with hypertension compared to those eating a carbohydrate diet.

The USDA has created a new set of dietary guidelines for the Americans in an effort to improve diet-related disease prevention. The guidelines include developing lifelong healthy eating patterns, focusing on variety, nutrient density, and amount of food we eat. Although the dietary guidelines are promoting healthy eating in broad terms, it does provide recommended intake broken down into macronutrients. The average adult is recommended to consume 10-30% protein, 45-65% carbohydrates, and 25-35% fats in an 1800 to 3000 calories for some men diet per day. (1)

Although the USDA's dietary guidelines account for the general health and wellness of the population, those who are more active or participate in athletics may have different needs. Studies have shown that an athlete or someone aiming to increase their muscle mass or athletic ability have a greater need for protein in their diet by up to 100% (3). Current data also suggest that daily protein recommendations should be increase for those who are simply active and not a training athlete. Results in one study found greater chances of developing more lean body mass were possible with increased protein intake.(3)

The use of protein supplements is most widely seen in strength trained individuals. It is estimated that as high as 88% of athletes use some type of supplement. The largest population of supplement users likely reside in gyms and therefore are the major target for marketers.(5)

Because the gym members generally go for recreational physical activity they also are a more open demographic in the aspect of supplement ingredients and substances. Recreational gym users will not be under any external pressure to avoid any certain supplement like those who are competing athletes in many organized and competitive sports.

2.3 Food Purchasing Decisions

Numerous studies have been conducted on why, when, and where people buy food. While nutrition may seem to be the most important aspect of the food a person puts in their body, it doesn't seem to be the first thing they think about when choosing food. Studies have shown that Americans value taste and cost first, other factors like convenience, nutrition, culture, health lifestyle, and other beliefs are valued less when determining food choices. In one study nutritional value was only marginally considered before convenience when choosing food. (7)

CHAPTER 3

DATA DESCRIPTION

Data for this paper was taken from the 2013-2014 National Health and Nutrition Examination Survey. The National Health and Nutrition Examination Survey (NHANES) is a program of the National Center of Health Statistics (NCHS) that combines examinations and interviews to assess the health and nutrition status of adults and children in the United States. The NHANES examinations consists of physiological, dental, and medical measurements while the interview contains health-related, dietary, socioeconomic, and demographic questions. The health survey is conducted in respondent's homes conducted by health and dietary interviewers. Respondents were compensated to encourage participation and to accumulate a broad sample. For this study we will only be using the interview data described below.

- Days physically active at least 60 minutes. – How many days the respondent spent at least 60 minutes' total doing any type of physical activity that increase the heart rate and made them breathe hard some of the time
- Age- Age in years at time of screening
- Education- Highest level of school completed or highest degree received.
- Annual Household Income- Total household income reported in range value of dollars

The complete 2013- 2014 NHANES survey had a total of 10,175 participants who completed the survey. For this study the number was reduced to 4181 of the participants so that only those respondents who reported the use of any kind of supplement are included. Of the supplement users 211 indicated they used a protein supplement in the last 30 days. Of the 211 respondents who had indicated the use of a protein supplement, 60 percent of those respondents

only stated the consumption of one gram of protein supplement or less and 32 percent responded their consumption was between 1 and 10 grams.

Of the variables considered, physical activity is likely the highest factor in protein consumption. A total of 1238 participants reported daily activity. Of those respondents, more than three quarters indicated they were physically active 4 or more days of the week of those 60 percent reported being active every day. The next largest group at about 10 percent are active at least 60 minutes 5 days of the week. A small portion of 4 percent reported 6 days of activity at least 60 minutes and less than 1 percent reported not knowing. The remaining respondents reported between 4 and 0 days being active 60 minutes or more.(figure 1)

Education is broken up into 5 categories: 9th grade or below, some high school, high school diploma or GED, some college or associate's degree, and college graduate or above. The greatest proportion of respondents have at least some college education. Those with some college or an associate's degree make up 32% of the respondents and 31% of the respondents have a college degree or higher.(figure 2) The large percentage of respondents with higher education is somewhat reflected in the reports of household income. The largest combined group are of reported incomes by respondents are those making $75,000-99,999 a year and those who have a household income of $100,000 or more annually. The remaining groups show a relatively normal distribution of income between $0 and $74,999 annually. (figure 3)

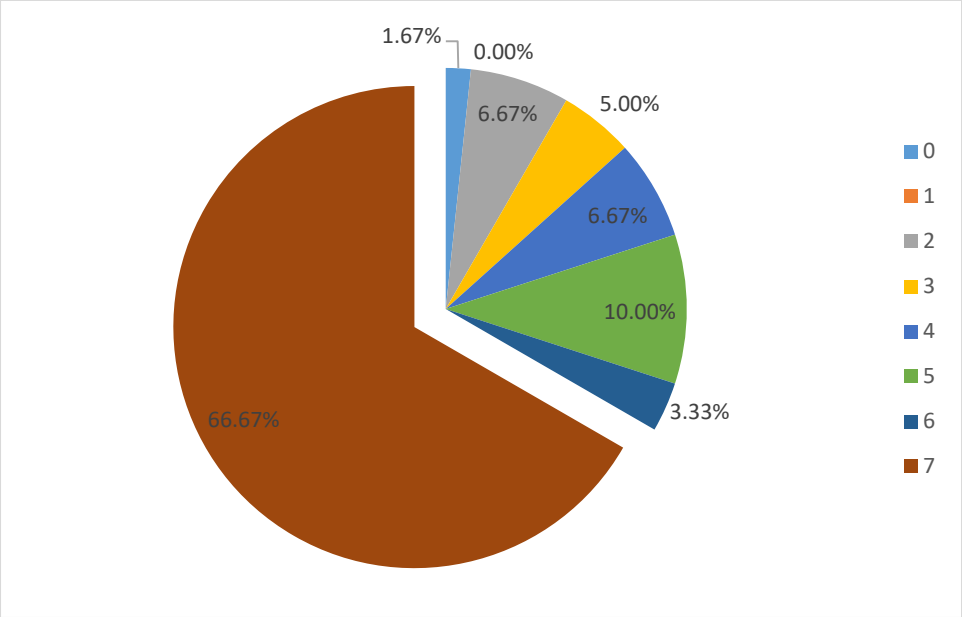

Figure 1
Days Physically Active at Least 60

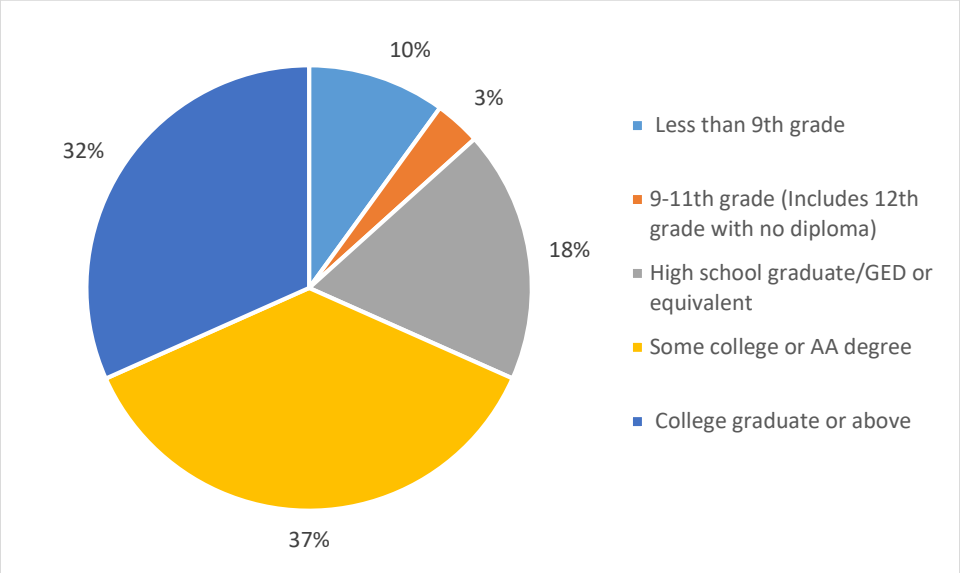

Figure 2
Education Level

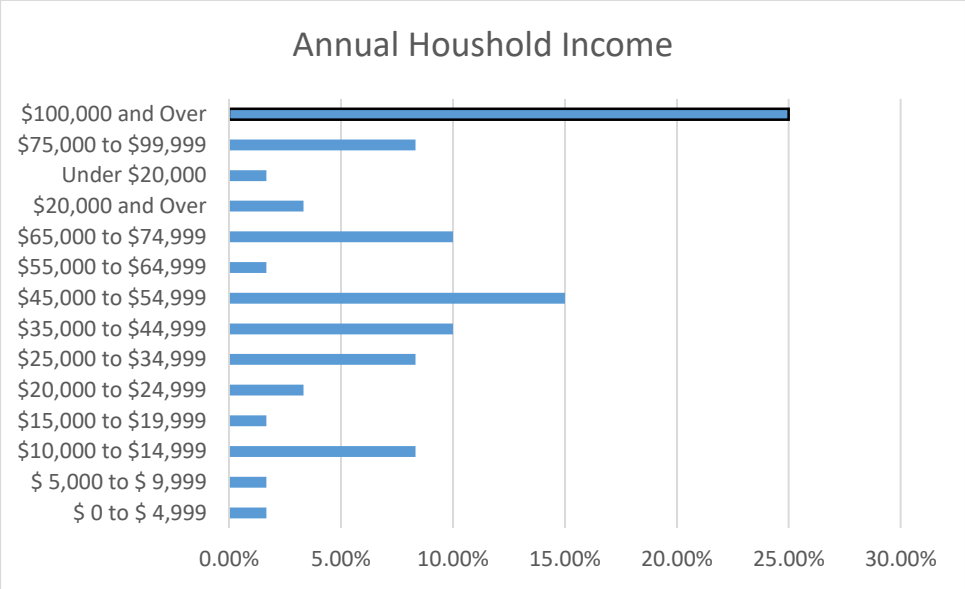

Figure 3
Annual Family income

Table 1. Definitions of Variables

Variable	Description	Mean	Std. Dev
AGE	Age (years)	50.13	15.52
DAYSACTIVE	How many days the respondent spent at least 60 minutes' total doing any type of physical activity that increase the heart rate and made them breathe hard some of the time. Range 0-7, 99= don't know	5.92	1.79
INCOME	Annual Household Income 1=$0-$4,999; 2=$5000-$9,999; 3=$10,000-$14,999; 4=$15,000-$19,999; 5=$20,000-$24,999; 6= $25,000-$34,999; 7=$35,000-$44,999; 8=$45,000-$54,999; 9=$55,000-$64,999; 10=$65,000-$74,999; 12= $20,000 and over; 13= <$20,000; 15= $100,000 and over; 77= refused; 99= don't know	9.62	4.34
EDUCATION	1= 9th grade or below; 2= some high school; 3= high school diploma or GED; some college or associates degree; 5= college degree or above	3.77	1.23
ACT0	1=ACTIVITY=0 0=otherwise	1.67%	
ACT1	1=ACTIVITY=1 0=otherwise	0.00%	
ACT2	1=ACTIVITY=2 0=otherwise	6.67%	
ACT3	1=ACTIVITY=3 0=otherwise	5.00%	
ACT4	1=ACTIVITY=4 0=otherwise	6.67%	
ACT5	1=ACTIVITY=5 0=otherwise	10.00%	
ACT6	1=ACTIVITY=6 0=otherwise	3.33%	
ACT7	1=ACTIVITY=7 0=otherwise	66.67%	

3.1 Hypothesized Relationships

When thinking about what characteristics consumers who purchase protein supplement possess, we often think of athletic or active people because of the presences of protein supplement in a sports environment.

- H1: Individuals reporting higher physical activity levels consume higher amounts of protein supplements.

Other characteristics like a college education pose relevance not only from simply an information stand point but also a social aspect. College student are often more active and involved with sports of some kind and also have more contact with similar peers. College students also often have irregular schedules which may lead to the use of meal replacements(a form of protein supplement).

- H2: Individuals with higher levels of education consume higher amounts of protein supplements.

Those with higher education will likely have a higher income and continue to use protein supplements.

- H3: Households earning higher annual income will report a change in the amount of protein supplement they use.

We assume that as people age they will have more regular schedules and may not be as active and be less likely to use protein like the younger population.

- H4: Older individuals consume lower amounts of protein supplements.

CHAPTER 4

EMPERICAL MODEL

The empirical models developed in this chapter attempt to clarify the factors including socio-demographic and physical activity in consumer behavior that effect protein supplement use. Two regression models were developed to assess consumer groups:

Model 1:

$$PROTEIN = \beta_0 + \beta_1(AGE) + \beta_2(DAYSACTIVE) + \beta_3(INCOME) + \beta_4(EDUCATION) + e$$

Model 2:

$$PROTEIN = \beta_0 + \beta_5(AGE) + \beta_6(INCOME) + \beta_7(EDUCATION) + \beta_8(ACT2) + \beta_9(ACT3) + \beta_{10}(ACT4) + \beta_{11}(ACT5) + \beta_{12}(ACT6) + \beta_{13}(ACT7) +$$

Model 1 is a basic OLS regression model to look at the overall effects of age, activity, income, and education on protein supplement use. Model 2 breaks down levels of activity to get a closer look at the effects of how active consumers are on protein supplement use by separating the activity level in to dummy variables. The results of these equations can be found summarized in Table 2.

Table 2. Estimation Results for Models 1-2

Dependent Variable	**Model 1**		Model 2	
Constant	**26.1015**	**(2.97)**	11.2205	(1.07)
AGE	**-0.2519**	**(-2.60)***	-0.2168	(-2.65)
DAYSACTIVE	**-1.9160**	**(-2.42)**	-	-
INCOME	**0.1061**	**(0.31)**	-0.1467	(0.50)
EDUCATION	**0.3373**	**(0.27)**	0.3496	(-0.32)
ACT1	-	-	-	-
ACT2	-	-	0.8782	(0.09)
ACT3	-	-	33.2965	(3.27)
ACT4	-	-	13.6658	(1.37)
ACT5	-	-	3.4676	(0.37)
ACT6	-	-	-1.8533	(-0.17)
ACT7	-	-	-1.6003	(0.18)
Number of observations	**60**		60	
R-values	**.2310**		.5413	

Note: (*) denotes statistical significance at 95% confidence
α=0.05

The R-values, thought they are not strong(.2310 and .5413), are acceptable. The results show interesting effects when subjected to a t-test with a 95% confidence level. The coefficient of AGE(β_1=-0.2518 and t=-2.60) is negatively and significantly effecting protein supplement use. This corresponds with H3 which indicated a negative correlation between protein supplement use and age. Interestingly the coefficient for DAYSACTIVE ((β_2=-1.9160 and

t=2.42) is also negatively and significantly effecting protein supplement use. The hypothesis for the relationship between DAYSACTIVE and PROTEIN was that of a positive relationship stated in H1. Interestingly, the coefficient for DAYSACTIVE suggests a negative effect on the supplement intake. This does sound counterintuitive, but I explore this further in model 2. INCOME and EDUCATION both have coefficients (β_3=0.1061 andβ_4=0.3373) positively effecting protein supplement use but are statistically insignificant with t-values of 0.31 and 0.27 respectively.

Model 2 shows a more in depth look at activity levels and their effects on protein supplement use. Instead of having one variable indicating the number of days a person is physically active, I create dummy variables for each of the response. So, there are seven dummy variables with each indicating how many days the respondents was physically active. As we see in model 1 DAYSACTIVE as a whole has a negative effect on protein supplement use. Breaking DAYSACTIVE up we can identify if any individual level of activity will positively affect protein supplement use. When running the OLS regression analysis several dummy variable were omitted due to linear dependency or singularity. The variables included ACT0 and ACT1 representing those active for at least 60 minutes 0 days a week and 1 day a week respectively

The resulting estimation of model 2 shows that AGE is similarly effecting protein supplement use as model 1 with β_5=-0.2168 and t= -2.65. EDUCATION and INCOME however, differ in model 2 from model 1. INCOME in model 1 had a positive yet statistically insignificant effect on protein supplement use. Model 2 show the INCOME coefficient having a negative though still statistically insignificant effect on protein supplement use (β_6=-0.1467) EDUCATION also consistent in models 1 and 2. The sign in in both models is positive and the

coefficient estimation of EDUCATION remains statistically insignificant in model 2 (β_7=0.3496 and t=-0.32)

Of the dummy variables for activity level, coefficients for ACT3, ACT4, and ACT5 show a positive effect on protein supplement use (β_9=33.2965, β_{10}=13.6658, β_{11}=3.4676) when compared to those who are active at least 60 minutes 1 or less days of the week. The remaining dummy variables, ACT2($\beta_8 = 0.8782$, ACT6(β_{12}=-1.8533, and ACT7(β_{12}=-1.6003, show a statistically insignificant effect on the use of protein supplements when compared to those who are active at least 60 minutes 1 or less days of the week. Apart from ACT3 the other dummy variables did not result in statistically significant effects on Protein supplement use.

CHAPTER 5

SUMMARY AND CONCLUSIONS

5.1 Discussion of Results

Regression analysis in this study was used to determine the effects of, age, activity level, education, and income on the use of protein supplements. Hypothesis 1 stated that individuals reporting higher levels of activity will report higher amounts of protein supplement use. The results of model 1 do not validate this hypothesis. The results of model 1 showed that individuals with increasing activity level used decreasing amounts of protein supplement. The coefficient for DAYSACTIVE was about -1.92 and the t-statistic was -2.42. To interpret this coefficient we would say that as an individual increase activity one day, protein supplement use would decrease by 1.92 grams. The negative relationship indicates that higher levels of activity corresponding with lower levels of protein supplement use though the relationship is not statistically significant.

Hypothesis 2 stated that individuals with higher levels of education will report use of higher amounts of protein supplement. Although the EDUCATION coefficient 0.3496 follows hypothesis 2, it cannot be validated due to the t-statistic being statistically insignificant at 0.32. Like hypothesis 2, Hypothesis 3 is not validated in model 1. Hypothesis 3 states that individuals with higher income will report use of higher amounts protein supplement. Model 1 shows a positive INCOME coefficient (0.1061) which corresponds with hypothesis 3, but again the t-statistic (0.31) make it statistically insignificant.

The results from model 1 do validate hypothesis 4 in a statistically significant manner which states that older individuals will reports using lower amounts of protein supplement. The coefficient of AGE was -0.2519 and the t-statistic was -2.60. To interpret this coefficient, we

would say an increase in an individual's age by one year will lead to a decrease of 0.2519 grams of protein supplement reported.

Model 2 results in weaker coefficients in INCOME and EDUCATION at, -0.1467, and 0.3496 respectively and a stronger R-value .5413. AGE is still statistically significant with a t-statistic of -2.65 and INCOME remains statistically insignificant with a t=statistic of 0.50. EDUCATION however, has a larger coefficient on model 2 (0.3496) than model 1 (0.3373) but is still not statistically significant in model 2 with a t-statistic of 0.32.

Of the dummy variables, ACT3 is statistically significant with coefficients 33.2965 and a t-statistics of 3.27. To interpret ACT3, we would say that an individual who is physically active 3 days of the week consumes 33.2965 more grams of protein supplement than an individual who is physically active one or fewer days of the week. ACT4 has the next highest effect of the dummy variables with a coefficient of 13.6658 and t value equal to 1.37 though it is not statistically significant. The interpretation of ACT4 is that an individual who is physically active 4 days of the week will report 13.6658 more grams of protein supplement than an individual who is physically active one or fewer days of the week. The remaining dummy variables, ACT2, ACT5, ACT6, and ACT7, are statistically insignificant with t-statistics of 0.09, 0.37, -0.17, and -0.18 respectively.

The result of the 3 days a week is no surprise as that is a popular schedule for lifters and athletes. The coefficient(33.2965) also translates easily to life application as the majority of protein supplements use serving sizes between 20 and 30 grams of protein.

5.2 Implications

Though this research is only on a small set of variables further study of the consumer characteristics of proteins supplement users can be beneficial to marketers because of the

growing supplement industry. There may be markets not yet realized. This study examined socio-demographic and physical activity variable for a broad understanding of which consumer groups use protein supplements. Future research of this natures can be conducted considering sets of narrower consumer groups to provide a more complete understanding of consumers that use protein supplements.

BIBLIOGRAPHY

1. "Appendix 7. Nutritional Goals for Age-Sex Groups Based on Dietary Reference Intakes and Dietary Guidelines Recommendations." Appendix 7. Nutritional Goals for Age-Sex Groups Based on Dietary Reference Intakes and Dietary Guidelines Recommendations - 2015-2020 DietaryGuidelines. https://health.gov/dietaryguidelines/2015/guidelines/appendix-7/.

2. Cermak, N. M., P. T. Res, L. C. P. G. M. de Groot, W. H. M. Saris, and L. J. van Loon. 2012. "Protein supplementation augments the adaptive response of skeletal muscle to resistance-type exercise training: a meta-analysis." American Journal Of Clinical Nutrition 96, no. 6: 1454-1464. CAB

3. Dallefeld, Matthew A. 2009. Collegiate strength trained males and protein supplement purchasing decisions. [electronic resource]. n.p.: [Carbondale, Ill. : Southern Illinois University Carbondale], 2009., 2009. SIUC online resources

4. "Executive Summary." Executive Summary - 2015-2020 Dietary Guidelines. Accessed April 13, 2017. https://health.gov/dietaryguidelines/2015/guidelines/executive-summary/.

5. Khoury, D. El, and S. Antoine-Jonville. "Intake of Nutritional Supplements among People Exercising in Gyms in Beirut City." Journal of Nutrition and Metabolism 2012 (2012): 1-12. doi:10.1155/2012/703490.

6. El Khoury, D., & Antoine-Jonville, S. (2012). Intake of Nutritional Supplements among People Exercising in Gyms in Beirut City. Journal of Nutrition and Metabolism, 2012, 703490. http://doi.org/10.1155/2012/703490

7. Glanz K, Basil M, Maibach E, Goldberg J, Snyder D. Why americans eat what they do: Taste, nutrition, cost, convenience, and weight control concerns as influences on food consumption. J Am Diet Assoc. 1998;98:1118-1126.

8. Molitor, J, IJ Brown, Q Chan, M Papathomas, S Liverani, N Molitor, and P Elliott, et al. n.d. "Blood Pressure Differences Associated With Optimal Macronutrient Intake Trial for Heart Health (OMNIHEART)-Like Diet Compared With a Typical American Diet." Hypertension 64, no. 6: 1198-U86.

9. Peters, Cara Lee Okieshen, Jeremy Shelton, and Praveen Sharma. 2003. "An Investigation of Factors That Influence the Consumption of Dietary Supplements." Health Marketing Quarterly 21, no. 1/2: 113-136.

10. Royne, Marla B., Erin Willis, and Joshua T. Coleman. 2016. "The Effects of Familiarity with Dietary Supplement Advertising on Consumer Shopping Behavior." Society For Marketing Advances Proceedings 144-145.

11. Sax, Joanna K. "Dietary Supplements are Not all Safe and Not all Food: How the Low Cost of Dietary Supplements Preys on the Consumer." American Journal of Law & Medicine 41, no. 2-3 (2015)

12. Schroeter, Christiane, Sven Anders, and Andrea Carlson. 2013. "The Economics of Health and Vitamin Consumption." Applied Economic Perspectives & Policy 35, no. 1: 125-149.

13. Wilson, Magdalena M., Jill Reedy, and Susan M. Krebs-Smith. "American Diet Quality: Where It Is, Where It Is Heading, and What It Could Be." Journal of the Academy of Nutrition and Dietetics 116, no. 2 (2016).

14. Wu, Guoyao, Jessica Fanzo, Dennis D. Miller, Prabhu Pingali, Mark Post, Jean L. Steiner, and Anna E. Thalacker-Mercer. "Production and supply of high- quality food protein for human consumption: sustainability, challenges, and innovations." Annals of the New York Academy of Sciences 1321, no. 1 (2014)

VITA

Graduate School
Southern Illinois University

Freya Block

Freyablock24@gmail.com

Southern Illinois University Carbondale
Bachelor of Science, Agriculture Systems and Education, May 2016

Research Paper Title:
Consumer Profiles of Protein Supplement Users

Major Professor: Jebara Asivatham