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Poultry Labeling: Knowledge, Perceptions, and Preferences among Adolescents

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Poultry Labeling: Knowledge, Perceptions, and Preferences among Adolescents

A thesis submitted in partial fulfillment
of the requirements for the degree of
Master of Science in Agricultural and Extension Education

by

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University of Arkansas
Bachelor of Science in Poultry Science, 2017

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This thesis is approved for recommendation to the Graduate Council.

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Abstract

The purpose of this study was to determine the knowledge, perceptions, and preferences of adolescents in regard to the labeling of poultry products. The theory of planned behavior (TPB) and Elaboration Likelihood Model (ELM) were used to display the relationship of perceptions, attitude, and behavior intentions. Quantitative data was collected in a descriptive research design. The population included youth, aged 14 – 18 years, involved in the Arkansas 4-H State O’Rama competition (N = 400). The sample ($n = 80$) ensured a 90% confidence interval of the population. Data was collected by administering paper surveys that addressed four product labels including *no added hormones*, *non-GMO project verified*, *USDA organic*, and *no antibiotics ever*. The sample consisted primarily of white (81.7%; $n = 67$), females (64.6%; $n = 53$), who lived on a farm (59.8%; $n = 49$). There was a correlation between responses of understanding and trust ($r = .247$). Although perceived understanding was rated 70% for each of the labels, actual knowledge was determined to be 45%. Analysis of preference resulted in an ideal combination of \$1.89 + *USDA organic* + *no hormones added* + *non-GMO* and produced a utility score of .537. Although label claims played a role in participant’s choices, price remained the most important aspect of the choices. The gap found between actual knowledge and perceived understanding of participants shows room for improvement in food literacy education. Along with confidence as a consumer, knowledge in food literacy will increase trust in products, brands, and labels even when labels were present on the products, participants chose the product with the lowest price. These adolescents placed a high priority on taste, price, and nutritional benefit. Suggestions for further research include using this instrument to conduct research with different demographics, labels, or products.

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CHAPTER 1

Introduction

Need for the Study

The current world population is 7.6 billion and is expected to rise to 9.8 billion by 2050 (United Nations, 2015). As the population of the earth increases, agricultural production will need to increase by 70 percent (Alexandratos & Bruinsma, 2012). This projection requires the agricultural industry to increase production with fewer resources. While scientists and engineers in the agricultural field strive to make advancements to provide for this unprecedented population, consumers with their own agenda challenge them.

This reality is more pressing than ever for agriculture as it faces opposition from a society two to four generations removed from the farm. Of the U.S. population, 98 percent do not live on a farm or have much understanding of the industry (Doerfert, 2011). Bridging the gap between the knowledge of the public to the reality of agriculture is a continual challenge for agriculturalists. Additionally, consumers' choices drive products and processes within agricultural companies. Because of this, consumers who are involved and educated with the production of their food could assist in creating more effective and sustainable ways to improve food production. This type of consumer will be better equipped to make an informed decision and have peace of mind about what they are purchasing and consuming (Pray, 2016).

In recent years, products labeled for production processes such as organic or antibiotic free have gained popularity. Datamonitor (2012) reported the US organic food sector had been growing at an average of 9.4 percent for the past five years. Organic products can be sold for a higher premium without any proven nutritional or human safety difference (Van Loo et al., 2010). The perceptions of these products in regard to nutritional value, environmental

sustainability or animal welfare are often based on non-scientific sources such as social media. A majority of information available to the public revolves around organizations that are not directly involved with agriculture and passionate blogs by people who have never gotten the opportunity to see an operation firsthand (Tobey & Manore, 2014).

Current trends and issues within the poultry industry showcase this deception. Cage free eggs have become a niche market for companies to sell their product at a higher price. Consumers naturally tend to support this change because of the image of birds running free (Bejaei, Cheng, & Wiseman, 2011). In reality, the exposure of birds to feces, fighting, disease, and pests is greater in cage free operations, increasing mortality rates (Lay et al., 2011). Similar situations are true with issues such as genetically modified organisms (GMOs) and antibiotics. A decline in the utilization of antibiotics can create challenges in the care of an animal, creating welfare concerns (Lusk, Pruitt, & Norwood, 2006). Many people will pay a higher price for poultry labeled “No Hormones Added” although this practice has been illegal in the poultry industry since the 1950s (Watkins & Clark, 2011).

Many consumers have good intentions that create challenges counterproductive to their own goals. Often times, the decisions consumers make about these products are based more on emotion than scientific fact (Harris, Schwartz, & Brownell, 2010). When consumers are uninformed or misinformed about how their decisions affect industries, they could drive markets in a direction that cause other unintended damage. These are challenges that will not only affect industries, but the average consumer as well. The Center for Food Integrity lists three consequences of a gap between responsibility and trust of the industry. These consequences include advocacy for more oversight and regulations, rejection of products or information, and seeking alternate and perhaps unreliable sources (Center for Food Integrity, 2018).

The knowledge and perceptions consumers have today are not only being observed by producers but also the adolescents in their own homes. The emotional tie consumers may develop to products will have a greater influence on the children in their homes (Gunter & Furnham, 1998). A study by Beatty and Talpade (1994), assessing the influence adolescents have in family decision making, stated, “The more importance the teen attaches to a product, the higher the likelihood s/he will be motivated to participate in the decision process for that product” (Beatty & Talpade, 1994 p. 333). Other studies have often overlooked or neglected the influence these family members have in market predictions (Beatty & Talpade, 1994). The preferences of these youth will become increasingly important as they become the new drivers of demand in the marketplace.

Problem Statement

While there is ample research done analyzing the knowledge and perceptions about poultry labels of consumers as a whole (Bernard et al., 2007; Castellini, Martino, Le Bihan-Duval, & Berri, 2008; Samant & Seo, 2016), there are no studies concentrated on youth in this context. It is important to gain an understanding of the current knowledge and perspectives shared by this group of future consumers before establishing ways to make them more informed. This can provide an avenue for educators to improve food literacy as well as companies to determine future trends. The generations to come will set the stage for decisions agricultural industries make. Often, companies look years ahead to gain perspective on potential future trends (Harris et al., 2010). This study focuses on the following research priorities for 2016-2020 established by the American Association for Agricultural Education National Research Agenda. Priority 1: Public and Policy Maker Understanding of Agriculture and Natural Resources,

Priority 2: New Technologies, Practices, and Products Adoption Decisions, and Priority 3: Efficient and Effective Agricultural Education Programs (Roberts, Harder, & Brashears, 2016).

It is important to understand how youth view important issues in the agricultural industry and how their views will impact future products. Youth will share what they see on social media and rely on the information at hand when making opinions or voting on policies. The information gained in this study will provide a snapshot regarding how a group of youth view labels to use as a basis for food literacy programs.

Overview of Literature

This section provides an overview of key literature that pertains to the topic of this study. It includes a review of the growth of niche markets as well as consumers' willingness to pay (WTP) for these products. The research mentioned demonstrates how the growth in WTP for these products is related to how consumers learn about their food, or food socialization. Finally, the role of education in niche markets and product labeling is discussed. The purpose of this review is to provide a background of the previous research in this area before presenting the purpose and objectives of this study.

Niche Markets

Various studies have been conducted to discover the motivations behind the growth in niche markets in the poultry industry. A study done in Denmark in 2013 focused on the impact production methods had on consumer WTP when purchasing organic, conventional, or free-range chicken. The results showed taste expectations were a strong predictor of the WTP for these products. This implies consumers associate process-related characteristics with the eating quality of the products (Marian & Thogersen, 2013).

In 2010, researchers at the University of Arkansas conducted a study to expand knowledge about consumer perception of organic meat. Organic chicken was chosen as the focus because poultry is considered a gateway to other organic products. It was found the main motivation to purchase organic poultry was, “the perception that organic chicken has fewer residues (pesticides, hormones, antibiotics), is safer, and healthier” (Van Loo et al., 2010 p. 384).

The next year, the researchers conducted a follow-up experiment to demonstrate the consumer’s hypothetical WTP for organic poultry. The authors found the average consumer is willing to pay a 104 percent premium on USDA certified organic labeled products and a 35 percent premium on general organic labeled products because of a higher trust in the USDA label (Van Loo, Caputo, Nayga, Meullenet, & Ricke, 2011).

The consumer likelihood to pay more for these products will affect the development of these markets. An understanding of the motivations behind these trends could help the industry meet consumer preferences (Bernard et al., 2007). The preferences of the consumer are of value to producers when making market decisions, whether the consumer’s perceptions are reality or not. Cervantes (2015) argued many of these process-related niche trends are based on perceptions rather than scientific fact. Many of the consumer’s perceptions are based upon the concern of a lack of food safety in conventional products (Nestle, 2013). A report written by Academics Review, stated the growth of organic products over the past 25 years has been achieved through fear and deception (Schroeder, 2014).

Researchers in Canada published a paper in 2008 called “Predictions for Commercial Poultry Nutrition.” The paper stated the growth of these niche markets is expected to grow and change in years to come (Leeson, 2008).

Food Socialization

Perceptions and understanding of food products such as poultry with process related labels begins early in life. Decisions and comments made by parents can play a role in how these perceptions are formed. The influence a family has on consumer socialization is often related to the demographics of the family as well as age of the child (Gunter & Furnham, 1998).

The older children get, the more they recognize and recall marketing and advertisements (Ward, 1977). The independence children have in consumer decisions increases with age as well. The amount of independence a child will have when decision making will differ based on the importance the adolescent places on the product (Gunter & Furnham, 1998).

A study in 2016 focused on adolescents and food packaging perceptions. The results indicated adolescents who were more health-conscious tended to notice and consider labels and packaging in their purchase decisions more often. A recommendation of this study was to examine adolescents' food choice involvement and motivations to provide greater insight into the adolescents' market when making marketing decisions (Vila-López & Kuster-Boluda, 2016).

Education

At a conference on food literacy, Cynthia Baur stated the importance of starting communication where people are. She stated communication only happens when the communicator and the audience have a shared understanding of the meaning of the message. While graphics are a common form of communication on product packaging, pictures and symbols do not necessarily have universal meanings (Pray, 2016). This gap in communication can either be filled by providing visuals with a clear meaning or by educating the consumers.

A study conducted in 2015 found the affect education intervention had on consumers' attitude and understanding on process-related labels on poultry products. Although the change in

attitudes varied by the type of educational intervention received, the addition of education generally improved consumers' understanding of these products (Samant, Crandall, & Seo, 2016). Schroeder (2014) emphasized the need for transparency in product marketing. He stated the USDA organic seal is often mistakenly associated with meaning healthier, safer, and more nutritious, yet there are no regulations regarding food safety when this label is present.

Education will play a major role in bridging the gap between producer and consumer. This applies to adolescents as well. Hawthorne (2006) found even a brief educational program significantly affected adolescents' understanding of a nutrition label. The results led to recommendations for implementing educational programs in a variety of settings to increase adolescent and consumer knowledge.

Purpose and Objectives

Knowledge and Perceptions of Poultry Product Labels

The purpose of this study was to determine the knowledge and perceptions of adolescents about the labeling of poultry products. This study was guided by these objectives:

1. Describe adolescents' knowledge of the labeling of poultry products
2. Describe adolescents' perceptions of the labeling of poultry products
3. Describe adolescents' perceived trust in labels on poultry products
4. Describe important attributes to adolescents when purchasing poultry products

Preferences of Poultry Product Labels

The purpose of this study was to determine adolescents' preferences between poultry products with process related labels. This study was guided by these objectives:

1. Describe adolescents' preferences among poultry products with process related labels

2. Describe adolescents' willingness to pay (WTP) for poultry products with process related labels

Key Terms

A variety of terms are used in research to distinguish poultry labels that describe attributes other than nutrition. These include, sustainability and process-related labels (Samant et al., 2016), production methods (Pouta, Isoniemi, Makela, Heikkila, & Forsman-Hugg, 2010), sustainability claims (Samant & Seo, 2016), novel production attributes (Bernard, Pan, & Siroli, 2005; Bernard et al., 2007), and production standards (Hoogland, de Boer, & Boersema, 2007). For the purpose of this study, the terms production-related labels will be used to portray the type of labels in this particular study. Definitions of key terms include:

Chicken- used in survey as the specific term for poultry

Food Socialization- the process by which people learn about food (Pray, 2016).

Sustainable Production- the creation of goods and services using processes and systems that are non-polluting, conserving of energy and natural resources, economically viable, safe and healthful for workers, communities, and consumers, and socially and creatively rewarding for all working people (University of Massachusetts, n.d.).

The following production-related terms are defined by the United States Department of Agriculture (USDA). The requirements listed below must be met in order for the claim to be present on a product label.

Free range or free roaming- Producers must demonstrate to the Agency that the poultry has been allowed access to the outside (United States Department of Agriculture, 2015).

No hormones- *Hormones are not allowed in raising hogs or poultry.* Therefore, the claim "no hormones added" cannot be used on the labels of pork or poultry unless it is followed by a

statement that says "Federal regulations prohibit the use of hormones" (United States Department of Agriculture, 2015).

No antibiotics- The terms "no antibiotics added" may be used on labels for meat or poultry products if sufficient documentation is provided by the producer to the agency demonstrating that the animals were raised without antibiotics (United States Department of Agriculture, 2015).

Organic- can be used to label any product that contains a minimum of 95 percent organic ingredients (excluding salt and water). Up to 5 percent of the ingredients may be nonorganic agricultural products that are not commercially available as organic and/or nonagricultural products that are on the National List (United States Department of Agriculture, 2015).

Assumptions

It is assumed in this study that participants understood the questions asked as well as gave truthful answers to the best of their ability.

Limitations

Due to the age of the participants in this study (under 18 years of age), the research was limited to those who received parental consent. This study was limited to a convenience sample of 4-Hers attending the 2018 Arkansas State 4-H O'Rama. Therefore, the results cannot be generalized beyond the group of participating youth in this study. However, insight can be gained in other groups similar to the demographic group outlined in this research.

Institutional Review Board

Under requirement of the University of Arkansas, this study was submitted for Institutional Review Board (IRB) approval. It was determined that the participants in the study would not be exposed to more than minimal risk and that their confidentiality would be maintained and IRB approval was obtained (Appendix 1).

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CHAPTER 2

Poultry Labeling: Knowledge and Perceptions among Adolescents

Abstract

The purpose of this study was to determine the knowledge and perceptions of adolescents about the labeling of poultry products. The theory of planned behavior (TPB) was used to display the link between beliefs and behavior. Quantitative data was collected in a descriptive research design. The population included youth, aged 14- 18, involved in the Arkansas 4-H State O’Rama competition (N = 400). The sample ($n = 80$) ensures a 90% confidence interval of the population (Israel, 1992). Parental consent forms were obtained before data was collected by administering paper surveys. Labels addressed on the survey included *no added hormones*, *non-GMO project verified*, *USDA organic*, and *no antibiotics ever*. The instrument was reviewed by a panel of experts and pilot tested to ensure clarity and validity of the instrument. The sample consisted primarily of white (81.7%)($n = 67$) females (64.6%)($n = 53$) that lived on a farm (59.8%)($n = 49$). There was a correlation between responses of understanding and trust ($r = .247$). Although perceived understanding was rated 70% for each of the labels, actual knowledge was determined to be 45%. Participants also ranked the importance of six attributes in purchase decisions. The most important attribute was taste, followed by price, nutritional benefit, label, brand, and packaging design. The gap found between actual knowledge and perceived understanding of participants shows room for improvement in food literacy education. Along with confidence as a consumer, knowledge in food literacy will increase trust in products, brands, and labels. The adolescents placed a higher priority on taste, price, and nutritional benefit. Suggestions for further studies would be to conduct this survey with different demographics.

Introduction

The popularity of niche markets in the poultry industry have been on the rise as consumers have become more concerned about the issues involved with the production of their food (Bernard, Pan, & Pesek, 2007). This involves issues like food safety, animal welfare, and sustainability. Products labeled in regards to these attributes come with a higher price tag (Pearson & Henryks, 2008).

It is commonly argued these trends in consumer preference are based primarily on perception rather than scientific fact (Cervantes, 2015). While authoritative sources say genetically- modified organism (GMO) foods are safe to consume, a 2014 study by Health Focus International found 87% of consumers think non-GMO foods are healthier (Watson, 2015). Another study in 2015 by Pew Research Center concluded 88% of scientists surveyed agreed there was no food safety risk in GMO foods but only 37% of the public agrees with this view. Examples of education gaps between the scientist and the public like this are common in the poultry industry (Pray, 2016).

At a workshop on food literacy in 2016, William Hallman, of the State University of New Jersey described a cause of this discrepancy as this: “Many Americans lack the foundation in basic science to put new scientific information into any kind of context” (Pray, 2016, p. 24). He commented the public primarily uses words and pictures to understand marketing, while scientists communicate in a language of numbers (Pray, 2016). This gap in communication leads to consumers looking to other sources for information about their food that may or may not be credible (Center for Food Integrity, 2018).

How consumers learn about their food plays a large part in their perceptions and understanding. This process, known as food socialization, begins early in life, as children

observe their family (Pray, 2016). Children observe choices in the grocery store and restaurants as well as the emotion that goes with each choice. Parents play a major role in how children understand and perceive food. Comments and choices in the grocery store can have a powerful influence on a child’s knowledge and attitudes toward foods, especially in niche markets (Gunter & Furnham, 1998). How children are socialized to perceive food can provide information to educators and producers about these perceptions and how they influence behavior of the consumer (Pray, 2016).

Theoretical Framework

Understanding knowledge of participants is important to assess what is or should be required of regulated labels. The accuracy of this knowledge will impact the consumers’ perceptions of the product and that perception will guide buying behavior.

The theory of planned behavior (TPB) highlights the link between these beliefs and behavior. This model was developed to predict an individual’s intention to engage in a behavior. In Ajzen’s (1991) model, three considerations affect an individual’s intention to perform a behavior. These considerations include attitudes toward the behavior, subjective norms, and perceived behavioral control, as seen in Figure 1.

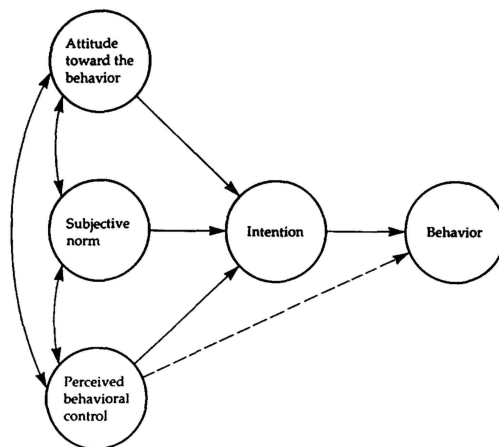


Figure 1. The Theory of Planned Behavior (Ajzen, 1991)

Attitude was determined by assessing adolescent's knowledge. The model explains that consumers will make decisions based on the perceived consequences associated with their behavior (Ajzen, 1991). Estes, Edgar, and Johnson (2015) found consumers in Arkansas who believed there were consequences to purchasing poultry products that were absent in reality. When consumers become more educated on the absence of these consequences, they will be more likely to purchase poultry products (Estes, Edgar, & Johnson, 2015).

The perceptions assessed in this study give insight to the subjective norms of the participants. The perceptions of the subjects were found by rating the impact each label had on purchase decision as well as ranking importance of attributes. When parents or friends think highly of a product, participants' perceptions are likely to be higher. Subjective norms cause individuals to gravitate towards things familiar to them or consistent with their social norms. A study that utilized the TPB model found a relationship between members of agricultural leadership disciplines in land - grant universities and having background in agricultural organizations or rural upbringing (Alexander, Rucker, Graham, Miller, & Apple, 2017). It is likely the members of this discipline were attracted to the agricultural field of study because of the familiarity of the topic and social norms of their peers.

An aspect of perceived behavior control was determined by assessing the perceived trust in the poultry labels. The perceived trust of a product contributes to the perceived behavior control because it constitutes what the consumer believes they are supporting by purchasing a product. Ajzen (1991) suggests control factors for an individual can be either internal (skills, compulsion) or external (time, opportunity). When a product becomes more available, their likelihood of purchasing the product is increased.

The objectives of this study aim to determine aspects of the attitudes, subjective norms, and perceived control of adolescents. Recommendations to increase purchase behavior of poultry products can be developed after determining these factors.

Purpose and Objectives

The purpose of this study was to determine the knowledge and perceptions of adolescents about the labeling of poultry products. This study was guided by these objectives:

1. Describe adolescents' knowledge of the labeling of poultry products
2. Describe adolescents' perceptions of the labeling of poultry products
3. Describe adolescents' perceived trust in labels on poultry products
4. Describe important attributes to adolescents when purchasing poultry products

Materials and Methods

This study was conducted in a descriptive research design. Quantitative data was collected in order to numerically represent the preferences of the adolescents in the population.

The subjects selected as the population for this research were youth involved in the Arkansas 4-H State O'Rama competition. O'Rama is a three-day event in which hundreds of 4-H members from around the state gather to compete, run for state officer positions, and be recognized for their involvement and excellence in the organization ("4-H members," 2013). All subjects were between the ages of 14 and 18. These students were chosen because of the accessibility of a large population of youth ($N = 400$) with access to consent from a parent or guardian to participate in the study. The sample consisted of students ($n = 80$) to obtain a representative sample and a response rate of 20%. This sample size ensures a 90% confidence interval of the population (Israel, 1992).

Initial permission was obtained to collect data at this event from Arkansas 4-H state staff. The state staff assisted in assessing possible access points of subjects to optimize sampling frame and data collection methods. Parental consent forms were turned in with O’Rama participant registration materials to ensure parental consent for all subjects under the age of 18 involved in this study (Appendix 3). IRB approval was obtained before completing this study (Appendix 1). Data was collected by administering paper surveys during the opening and closing ceremonies of the conference.

The researcher modified Samant’s (2015) instrument to meet the objectives for this study. The modified instrument was reviewed by a panel of experts for face and content validity. This panel of experts consisted of three professors in agricultural communications and one in human and environmental sciences with expertise in youth development and cognitive thinking. The resulting instrument was tested in a pilot study of 12 participants in a local church youth group. The pilot study was completed by youth aged 14 to 18 who would not be attending O’Rama. The youth participating in the pilot test completed a cognitive analysis to ensure clarity and validity of the instrument.

Internal consistency was confirmed based on the responses of the pilot study. Using SAS 9.4, a coefficient of stability of 0.175 was determined. This coefficient helped to establish the reliability of the instrument.

The resulting survey (Appendix 2) consisted of four parts: 1) Label on chicken products, 2) Consumer behavior for chicken products, 3) Consumer preference, and 4) Demographics.

Part 1 of the survey collected data on purchasing frequency of poultry products as well as the importance of attributes when making the decision to purchase poultry products.

Part 2 of the survey involved four questions per label to measure participants' knowledge and perception of the labels. Labels addressed on the survey included *no added hormones*, *non-GMO project verified*, *USDA organic*, and *no antibiotics ever*. The questions gathered information regarding the participants' personal rating of their understanding of the label, trust of the label, and affect the label has on purchase decision. These questions were rated on a 5-point Likert scale. Part 2 also contained a multiple choice knowledge based question for each label.

Part 3 was added to supplement a second study relating to the preferences of youth between poultry products with the labels listed above. The analysis of this section was not addressed in this study.

Part 4 gathered demographic information of participants. Questions about gender, age, number of people in household, ethnic background, and area of residence (rural, suburban, urban) were all present on this part of the instrument.

Findings

The purpose of the analysis of this data was to see where the average knowledge and perceptions of poultry labels lie for this population. This was accomplished by calculating descriptive statistics, including mean, standard deviation, and frequencies through SPSS 24. Inferential statistics analyzed included correlations.

The demographics of this study (Table 1) included 4-H students at a statewide conference. The sample consisted primarily of white (81.7%)($n = 67$) females (64.6%)($n = 53$) that lived on a farm (59.8%)($n = 49$). A total of 54% of participants lived in a household with 3 to 4 people. No correlations were found to be significant between objective data and demographics.

Table 1

Demographic Characteristics of Participants (n = 80)

Characteristic	<i>n</i>	%
Gender		
Male	25	30.5
Female	53	64.6
Age		
14	8	9.8
15	19	23.2
16	17	20.7
17	17	20.7
18	17	20.7
Number of People in Household		
1-2	2	2.6
3-4	45	54.8
5-6	18	22
7-8	9	12
9-10	1	1.2
Ethnic Background		
White	67	81.7
American Indian or Alaskan Native	5	6.1
Black/ African American	3	3.7
Asian	1	1.2
Native Hawaiian or Pacific Islander	0	0
Hispanic or Latino	2	2.4
Area of Residence		
Farm	49	59.8
Town under 10,000 and rural non-farm	22	26.8
Town/City 10,000-50,000 and its suburbs	3	3.7
Suburb of city more than 50,000	2	2.4
Central city more than 50,000	1	1.2

The mean understanding, trust, and impact of labels on participants' purchase decision are listed in Table 2. There was a correlation between responses of understanding and trust ($r = .247$).

Table 2

Mean Rank (1-5) of Label Understanding, Trust, and Impact on Purchase Decision

Label	Understanding	Trust	Impact on Purchase Decision
No Added Hormones	3.525	3.1111	2.6625
Non-GMO	3.7848	3.2405	2.7595
USDA Organic	3.2625	3.3846	2.7051
No Antibiotics Ever	3.4810	2.7949	2.6795
Mean	3.5133	3.1328	2.7017

Note. 1 = low; 5 = high.

The higher participants rated understanding of a label, the higher they rated trust. While participants claimed to have an above average understanding and trust of the product labels, presence of the label did not have as great of an impact on purchase decision.

Knowledge of the meaning of each label varied. The results indicated that 26% ($n = 21$) of participants answered correctly for *no added hormones*, 61% ($n = 50$) answered correctly for *non-GMO project verified*, 48% ($n = 39$) answered correctly for *USDA organic*, and 44% ($n = 36$) answered correctly for *no antibiotics ever*. Although perceived understanding was rated 70% for each of the labels, actual knowledge was determined to be 45%.

Participants also ranked the importance of six attributes in purchase decisions. The most important attribute was taste, followed by price, nutritional benefit, label, brand, and packaging design.

Conclusion

Results of this study contribute to an increased understanding of the outcomes of the desired objectives. These objectives focused on adolescents' knowledge, perceptions, and perceived trust in labels on poultry products. An additional objective was to determine important attributes to adolescents when purchasing poultry products.

The results demonstrate a gap between participants' actual knowledge and perceived understanding. This gap is an opportunity for education. When consumers are confused about

what a label means, it is more difficult to be confident in decisions or justify spending extra money on a product with a niche market label. The low score on knowledge of the meaning of the *no added hormones* label was not surprising. It is common to hear claims birds are given hormones to increase body weight. Few people know hormones have been banned from the poultry industry since 1906 (Watkins, Clark, & Thaxton, 2011). The correlation between understanding and trust is interesting as well. Being knowledgeable increases trust in a product.

The perceived trust in the product label very closely matched participants understanding. When trust is absent between a company and consumer, credibility is lost (Kang & Hustvedt, 2014). Therefore, to sell a product with labels that relate solely to production processes, trust has to be present. These labels represent attributes of a product that cannot be seen at the point of sale. Any added cost a consumer is willing to pay is because of trust in the product label claims.

While the participants showed some partiality to products with the production labels, they did not claim labels to be among the primary deciding factors in the purchase decision. These adolescents placed a higher priority on taste, price, and nutritional benefit. These are attributes that are clearer to see, understand, and trust. Credibility of these attributes can be established much easier through previous experience and nutrition labels.

Suggestions for further studies would be to conduct this survey with different demographics. Other ages or areas of residence may result in different priorities by consumers. As label claims continue to emerge and change, other studies could focus on labels that were not addressed in this study.

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CHAPTER 3

Poultry Labeling Preferences among Adolescents: A Conjoint Analysis

Abstract

The purpose of this study was to determine adolescents' preferences between poultry products with production-related labels. The theory of planned behavior (TPB) was used to display the link between intentions and behavior. This study collected quantitative data in a descriptive research design. The population included youth, aged 14 – 18 years, involved in the Arkansas 4-H State O-Rama competition (N = 400). The sample ($n = 80$) ensures a 90% confidence interval of the population (Israel, 1992). Parental consent forms were obtained before data was collected by administering paper surveys. The survey given included a conjoint analysis of product options including the presence or absence of each label, as well as price increments. Labels addressed on the survey included *no added hormones*, *non-GMO project verified*, *USDA organic*, and *no antibiotics ever*. The instrument was reviewed by a panel of experts and pilot tested to ensure clarity and validity of the instrument. The sample consisted primarily of white (81.7%)($n = 67$), females (64.6%)($n = 53$), who lived on a farm (59.8%)($n = 49$). Analysis of preference resulted in an ideal combination of \$1.89 + *USDA organic* present + *no hormones added* present + *no antibiotics ever* absent + *non-GMO* present. This combination produces a utility score of .537. Although label claims played a role in participant's choices, price remained the most important aspect of the choices. Suggestions for further studies would be to conduct this survey with different demographics, labels, or products.

Introduction

Niche markets in the poultry industry have continued to increase in supermarkets around the world, despite a higher price tag (Pearson & Henryks, 2008). Researchers in Canada published a paper predicting the growth and continuing evolution of niche markets in the poultry industry for years to come (Leeson, 2008). Studies have demonstrated consumers are willing to pay more for these products because of labels involving food safety, animal welfare, and sustainability (Van Loo, Caputo, Nayga, Meullenet, & Ricke, 2011).

The marketing of these products also plays a role in the consumer's preference. At a conference on public health in 2016, Sonya Grier described food marketing as, "the strategic use of product, price, and promotion to influence consumer attitudes and behaviors concerning foods" (Pray, 2016). Marketing of these products relies upon consumer emotion as much as knowledge. Decisions in the grocery store are often made without much cognitive effort or awareness. Decisions made in the grocery store are more important than they first seem.

Food socialization, which is the process by which people learn about food, happens early in life. Food socialization of an individual is affected by parental interaction, societal structure, ethnic rituals, media, and marketing (Pray, 2016). The interplay between how children are socialized within families will play a major role in the choices they make as consumers later in life (Pray, 2016). The combination of the interactions children have with food at home as well as online, will guide their preferences as they begin to make food choices for themselves.

Children are exposed to social media involving food now more than ever. A 2015 study conducted in Sweden, found that 91 percent of adolescents between age 13 and 16 years use social media (Holmberg, Chaplin, Hillman & Berg, 2016). The more importance a child attaches to a product, the more likely it is for him/her to participate in the decision process for that

product (Beatty & Talpade, 1994). The preferences of these youth will become increasingly important as they become the new drivers of demand in the marketplace.

It is important to understand how youth view important issues in the agricultural industry and how their views will impact future products. Youth will share what they see on social media and rely on the information at hand when making opinions or voting on policies. The generations to come will set the stage for decisions agricultural industries make. Often, companies look years ahead to gain perspective on potential future trends (Harris et al., 2010).

Consumers who are involved and educated with the production of their food could assist in creating more effective and sustainable ways to improve food production. This type of consumer will be better equipped to make an informed decision and have peace of mind about what they are purchasing and consuming (Pray, 2016).

Theoretical Framework

The theory of planned behavior model (TPB) displays the link between beliefs and behaviors. This model was developed to predict an individual's intention to engage in a behavior. In Ajzen's (1991) model (Figure 1), attitudes toward the behavior, subjective norms, and perceived behavioral control affect an individual's intention to perform a behavior.

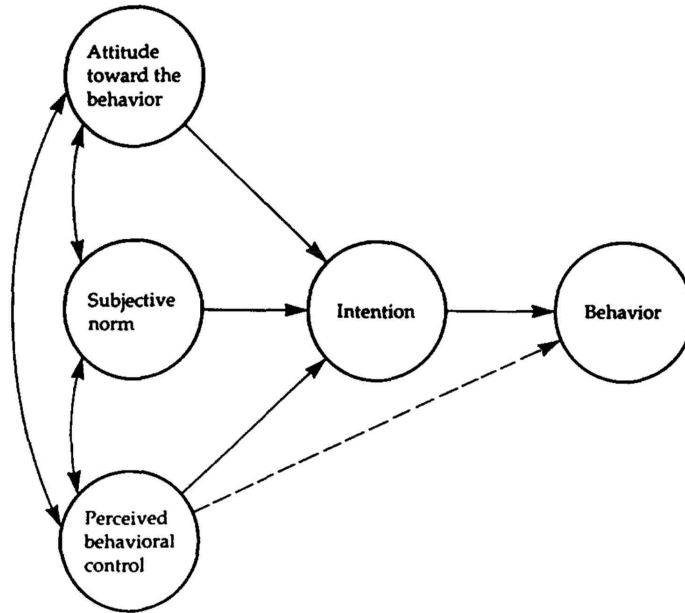


Figure 1. *The Theory of Planned Behavior* (Ajzen, 1991)

The assessment of preferences and willingness to purchase (WTP) of adolescents corresponds closely with the intentions aspect of the TPB. The intentions of consumers are the closest indicator to behavior habits without studying actual purchases (Ajzen, 1991). Preferences of participants are important to understand in order to assess the intentions of adolescents as they become active consumers.

Through the objectives of this study, a general idea of intentions of adolescents will be determined. These intentions will provide a snapshot of how youth view production- related labels in order to make recommendations to increase the purchase frequency of poultry products and marketing effectiveness.

Purpose and Objectives

The purpose of this study was to determine adolescents' preferences between poultry products with process related labels. This study was guided by these objectives:

1. Describe adolescents' preferences among poultry products with process related labels

2. Describe adolescents' willingness to pay (WTP) for poultry products with process related labels

Materials and Methods

This study was conducted in a descriptive research design. Quantitative data was collected to numerically represent the preferences of the adolescents in the population.

The subjects selected as the population for this research were youth involved in the 2018 Arkansas 4-H State O-Rama. O-Rama is a three day event in which hundreds of 4-H members from the state gather to compete, run for state office positions, and are recognized for their involvement and excellence in the organization ("4-H members," 2013). All subjects were between the ages of 14-18 years. These students were chosen because of the accessibility of a large population of youth ($N = 400$) with access to consent from a parent or guardian to participate in the study. The sample consisted of $n = 80$ students to obtain a representative sample and response rate of 20%. This sample size ensures a 90% confidence interval of the population (Israel, 1992).

Initial permission was obtained to collect data at this event from Arkansas 4-H state staff. The state staff assisted in assessing possible access points of subjects to optimize sampling frame and data collection methods. Parental consent forms were turned in with O-Rama participant registration materials to ensure parental consent for all subjects under the age of 18 involved in this study (Appendix 3). IRB approval was obtained before completing this study (Appendix 1). Data was collected by administering paper surveys during the opening and closing ceremonies of the conference.

The survey given included a conjoint analysis of product options on SPSS 24. A conjoint analysis is a common market research tool to compare the importance of multiple product attributes at different levels in a potential market setting (IBM Corporation, 2013). The conjoint

analysis design was embedded in a larger questionnaire including questions about demographics as well as the subjects' knowledge and perceptions regarding the labels in the conjoint design. Labels addressed on the survey included *no added hormones*, *non-GMO project verified*, *USDA organic*, and *no antibiotics ever*. An orthogonal design was created containing eight profiles of poultry products. These profiles included the presence or absence of each of the four product labels focused on in this study as well as multiple price points.

The selection of two factors to determine price were chosen based on the design of a similar conjoint study (Bernard, Pan, & Pesek, 2007). The first factor was the U.S. city average price for chicken breast, which was \$3.14 per pound in March 2018 (Bureau of Labor Statistics, 2018). The second factor included a manual collection of high and low price points for chicken breast in local supermarkets. These prices ranged from \$2.29 - \$9.99 per pound. Using a constant increment of \$2.70, the four prices included \$1.89, \$4.59, \$7.29, and \$9.99 per pound.

A full fractional factorial of these attributes would result in 64 (4x2x2x2x2) market options. An orthogonal array presents a fraction of these options in a way that presents enough options to determine the relative importance of each attribute. SPSS 24 was used to create the array consisting of eight profiles used in the survey administered (Table 1). Each of these profiles were presented to the participant in regard to their likelihood to purchase, accompanied by a 5-point Likert-type scale ranging from "definitely not" to "definitely".

Table 1

Conjoint Profiles

Profile	Price	Non-GMO	No Antibiotics Ever	No Added Hormones	Organic
1	\$9.99	Present	Absent	Present	Absent
2	\$4.59	Present	Present	Absent	Absent
3	\$1.89	Absent	Absent	Absent	Absent
4	\$4.59	Absent	Absent	Present	Present
5	\$7.29	Present	Absent	Absent	Present
6	\$9.99	Absent	Present	Absent	Present
7	\$1.89	Present	Present	Present	Present
8	\$7.29	Absent	Present	Present	Absent

The instrument was reviewed by a panel of experts for face and content validity. This panel of experts consisted of three professors in agricultural communication and one in human and environmental sciences with expertise in youth development and cognitive thinking. The resulting instrument was tested in a pilot study of 12 participants in a local church youth group. The pilot study was conducted by youth aged 14 to 18 years who would not be attending O-Rama. The youth participating in the pilot completed a cognitive analysis to ensure clarity and validity of the instrument.

Findings

The demographics of this study (Table 2) included 4-H students at a statewide conference. The sample consisted primarily of white (81.7%; $n = 67$), females (64.6%; $n = 53$), who lived on a farm (59.8%; $n = 49$). A total of 54.8% ($n = 45$) of participants lived in a household with 3 to 4 people.

Table 2

Demographic Characteristics of Participants (n = 80)

Characteristic	<i>n</i>	%
Gender		
Male	25	30.5
Female	53	64.6
Missing	4	4.9
Age		
14	8	9.8
15	19	23.2
16	17	20.7
17	17	20.7
18	17	20.7
Missing	4	4.9
Number of People in Household		
1-2	2	2.6
3-4	45	54.8
5-6	18	22
7-8	9	12
9-10	1	1.2
Missing	7	8.5
Ethnic Background		
White	67	81.7
American Indian or Alaskan Native	5	6.1
Black/ African American	3	3.7
Asian	1	1.2
Native Hawaiian or Pacific Islander	0	0
Hispanic or Latino	2	2.4
Missing	4	4.9
Area of Residence		
Farm	49	59.8
Town under 10,000 and rural non-farm	22	26.8
Town/City 10,000-50,000 and its suburbs	3	3.7
Suburb of city more than 50,000	2	2.4
Central city more than 50,000	1	1.2
Missing	5	6.1

Analysis of data was done through the conjoint procedure on SPSS 24. Analysis consisted of a utility score for each attribute to measure the preference level. Utility scores are expressed as a common unit, to allow all attributes to be compared directly. The utility score also allows the preference of attribute combinations that were not included in the questionnaire to be predicted. The utility scores of each attribute are listed in Table 3.

Table 3

Utility Scores for Attributes in Orthogonal Design

Attribute	Utility Estimate	Std. Error
Non-GMO		
Present	.170	.078
Absent	-.170	.078
No Antibiotics Ever		
Present	-.023	.078
Absent	.023	.078
No Added Hormones		
Present	.130	.078
Absent	-.130	.078
Organic		
Present	.152	.078
Absent	-.152	.078
Price		
\$1.89	-.145	.049
\$4.59	-.351	.119
\$7.29	-.557	.189
\$9.99	-.764	.259

Utility scores can identify the most preferred combination of attributes in the study. The highest utility score signifies the best product. The ideal combination in this study is \$1.89 (-.145) + *USDA organic* present (.152) + *no hormones added* present (.130) + *no antibiotics ever* absent (.23) + *non-GMO* present (.170). This combination produces a utility score of .537.

Although label claims played a role in participant's choices, price remained the most important aspect of the choices. Twenty-five participants stated they would definitely buy a product with all four label claims at \$1.89 while only 10 stated they would definitely buy a product with no label claims at \$1.89.

Conclusions

The results of this study give practical insight into consumer preferences of adolescents. The assessment of preferences and WTP of adolescents corresponds closely with the intentions aspect of the TPB model. The intentions of consumers are the closest indicator to behavior habits without studying actual purchases (Ajzen, 1991). Although adolescents may not be making

purchase decisions currently, gaining insight into their current food socialization can give a general picture of future behaviors (Shim, 1996). This insight is beneficial to companies in order to understand the practical importance of having informed consumers. Companies can adjust their products to best fit the demands of future generations of consumers.

The first objective of this study was to describe adolescents' preferences among poultry products with process related labels. Although price was the most important attribute, the results showed participants preferred products with the *USDA organic* label the most.

The second objective of this study was to describe adolescents' WTP for poultry products with production-related labels. Even when labels were present on the products, participants chose the product with the lowest price. Some participants were willing to pay a higher price for labels such as USDA organic, but few chose to pay the highest price for the presence of any of the labels.

Adolescents in rural areas do not seem to be concerned with the production processes as much as the price although, if certain label claims accompany a low price, this is the preferred product. The intentions of the participants found in this study demonstrate the importance of price in purchase decision. If price remains of utmost importance to these adolescents as they become active consumers, it will be difficult to sell niche products at a high premium.

As youth become more involved with social media, what they see and share will affect their choices in the marketplace (Resti & Purwanegara, 2013). Adolescents often even participate in the advertising by showcasing brands through contests or pictures of their meals. (Holmberg et al., 2016). Social media marketing can be effective but should be used with integrity.

There is also a need for transparency in product marketing. A report written by Academics Review, stated the growth of organic products over the past 25 years has been achieved through fear and deception (Schroeder, 2014). When trust is absent between a company and consumer, credibility is lost (Kang & Hustvedt, 2014).

Education will play a major role in bridging the gap between producer and consumer. This applies to adolescents as well. Hawthorne (2006) found even a brief educational program significantly affected adolescents' understanding of a nutrition label. Consumer education and trust provides producers with a market that will continue to grow.

Suggestions for further studies would be to conduct this survey with different demographics. Other ages or areas of residence may result in different priorities by consumers. The preferences of consumers in regard to production-related labels may also change based on the product. Continued research should look into how adolescences' preferences change based on the type of agricultural product such as beef, grains, or cotton. As label claims continue to emerge and change, other studies could focus on labels that were not addressed in this study.

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CHAPTER 4

Conclusion

The theory of planned behavior (TPB) displays the link between beliefs and behavior (chapter 3). This model was developed to predict an individual's intention to engage in a behavior.

The gap found between actual knowledge and perceived understanding of participants shows room for improvement in food literacy education. The adolescents in this study are misinterpreting the meanings of the labels studied. Increasing the knowledge will enable the participants to become confident in purchase decisions in the future. While the subjects may not be actively buying products now, their participation in purchase decisions will increase as they get older (Gunter & Furnham, 1998).

Along with confidence as a consumer, knowledge in food literacy will increase trust in products, brands, and labels. The data supported the idea that understanding and trust go hand in hand. When participants were less confident in their understanding of a label, their trust in the label itself was scored lower. Trust is especially important with labels that relate solely to production processes because the benefits cannot be seen first-hand by the consumer.

While the participants showed some partiality to products with the production labels, they did not claim labels to be among the primary deciding factors in the purchase decision. These adolescents placed a higher priority on taste, price, and nutritional benefit.

The assessment of preferences and WTP of adolescents in chapter 3 corresponds closely with the intentions aspect of the TPB model, which are the closest indicator to behavior habits without studying actual purchases. Even when labels were present on the products, participants chose the product with the lowest price. Some participants were willing to pay a higher price for

labels such as USDA organic, but few chose to pay the highest price for the presence of any of the labels. Adolescents in the population do not seem to be concerned with the production processes as much as the price although if certain label claims accompany a low price, this is the preferred product.

The insight into consumers' beliefs and behaviors through the TPB model is beneficial to both companies and educators. Companies can adjust their products to best fit the demands of future generations of consumers. Educators can identify gaps in knowledge and understand the practical importance of having informed consumers.

Suggestions for further studies would be to conduct this survey to different demographics, labels, or products. Other ages or areas of residence may result in different priorities by consumers. As label claims continue to emerge and change, other studies could focus on labels that were not addressed in this study. The information gained in this study will be relevant for predicting potential market trends as well as determining approaches to improving food literacy for adolescents.

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Appendices

1. Institutional Review Board



To: Eleni Solberg
BELL 4188

From: Douglas James Adams, Chair
IRB Committee

Date: 07/02/2018
Action: **Expedited Approval**
Action Date: 07/02/2018
Protocol #: 1805121506
Study Title: Poultry Labeling: knowledge, perceptions and preferences of adolescents
Expiration Date: 05/24/2019
Last Approval Date:

The above-referenced protocol has been approved following expedited review by the IRB Committee that oversees research with human subjects.

If the research involves collaboration with another institution then the research cannot commence until the Committee receives written notification of approval from the collaborating institution's IRB.

It is the Principal Investigator's responsibility to obtain review and continued approval before the expiration date.

Protocols are approved for a maximum period of one year. You may not continue any research activity beyond the expiration date without Committee approval. Please submit continuation requests early enough to allow sufficient time for review. Failure to receive approval for continuation before the expiration date will result in the automatic suspension of the approval of this protocol. Information collected following suspension is unapproved research and cannot be reported or published as research data. If you do not wish continued approval, please notify the Committee of the study closure.

Adverse Events: Any serious or unexpected adverse event must be reported to the IRB Committee within 48 hours. All other adverse events should be reported within 10 working days.

Amendments: If you wish to change any aspect of this study, such as the procedures, the consent forms, study personnel, or number of participants, please submit an amendment to the IRB. All changes must be approved by the IRB Committee before they can be initiated.

You must maintain a research file for at least 3 years after completion of the study. This file should include all correspondence with the IRB Committee, original signed consent forms, and study data.

cc: Jill Rucker, Investigator

2. Questionnaire

Poultry Labeling Questionnaire

- I have discussed this study with my parent/guardian, and I agree to participate. I understand that even if they signed the consent form, that it is okay if I choose not to participate. I will not get in trouble if I choose to not complete this survey.

Thank you for your participation in this study. This survey is designed to gauge the knowledge, perceptions, and preferences of four labels found on chicken products. Please read the questions carefully and answer to the best of your ability.

1. Select the category in which your primary 4-H project fits into:

- A. Strengthening Families (family life)
- B. Extending Resources (fabrics and fashions, consumer education, housing and home environment)
- C. Enhance Health and Wellbeing (foods and nutrition, health and fitness, bicycle, etc.)
- D. Encourage Individual Development (leadership, arts and humanities, photography, etc.)
- E. Agriculture
- F. Animal Science
- G. Plant Science
- H. Protecting the Environment
- I. Utilizing Science and Technology (energy management, entomology, veterinary science, etc.)

Part 1. Consumer Behavior for Chicken Products

This portion of the survey is designed to examine your eating and purchasing behaviors for chicken products. Please answer the following questions.

2. How often did you or your family purchase chicken products within the last month?

	Never	1-3 times	4-6 times	7-9 times	10+ times
Raw Fresh Chicken					
Raw Frozen Chicken					
Processed Chicken					

3. When purchasing chicken products, how important are the following attributes to you?

	1 Unimportant	2	3	4	5 Important



21.

1
Definitely Not

2

3

4

5
Definitely



22.

1
Definitely Not

2

3

4

5
Definitely



23.

1
Definitely Not

2

3

4

5
Definitely



24.

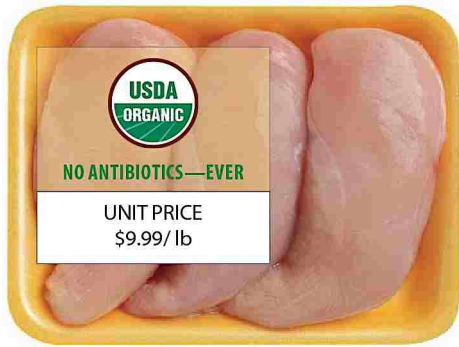
1
Definitely Not

2

3

4

5
Definitely



25.

1
Definitely Not

2

3

4

5
Definitely



26.

1
Definitely Not

2

3

4

5
Definitely

32. Which of the following best describes the area you live in?

- A. Farm
- B. Town under 10,000 and rural non-farm
- C. Town/City 10,000- 50,000 and its suburbs
- D. Suburb of city more than 50,000
- E. Central city more than 50,000

Thank you for your participation! Be sure all questions are answered and hand in your survey to the researcher or assistant(s).

3. Consent Form

Consent Form

Dear Parent or Guardian,

I am a graduate student at the University of Arkansas working to complete my master's thesis in Agricultural and Extension Education. I have a bachelor's degree in Poultry Science from the UofA. I am conducting research on adolescents' knowledge, perceptions, and preferences poultry labels (organic, hormone free, etc.). The goal of my research is to determine how much adolescents currently know in order to improve food literacy and predict market trends in the future.

Arkansas State 4-H O'Rama was chosen as a location for this study because of convenient access to a large population of adolescents. Participants will be given a survey to determine their knowledge, perceptions, and preferences to poultry products. This survey will take 10-15 minutes.

There are no risks connected to this project. Participation in this project is completely voluntary, and if students do not wish to participate in the project their participation in competitions will not be jeopardized. Students will have the opportunity to participate in this study during the conference with proof of parent/guardian consent.

All information gained will be kept confidential to the extent allowed by law and University policy. Participant will not write their names on the survey and other identifying information will be removed from the forms. No identifiers linking students to the study will be included in any report or publication.

I would greatly appreciate your child's participation in this research project. By signing below, you authorize the researcher to potentially include your child in this study. If you have any questions, you can contact me using the information listed below. Thank you for your support and participation.

Sincerely,
Eleni Solberg, Graduate Assistant

Jill Rucker, Faculty Supervisor

Child's name

Parent/Guardian Name

Signature

Date

This research study has been reviewed by the Institutional Review Board at the University of Arkansas. For research-related problems or questions regarding students' rights, you can contact Ro Windwalker, the University's Compliance Coordinator