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Northwest Arkansas Consumer Perceptions of Poultry Production

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Honors Thesis

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Abstract

Poultry production holds an important place in Arkansas economically and as a food source. The importance of poultry production ultimately hinges on the demands of the consumers and the perceptions that drive their purchases. With this in mind, this study surveyed consumers to assess their perceptions of poultry production in Arkansas. The instrument used to survey consumers was created by the researcher and an expert committee at the University of Arkansas. Consumers were interviewed through direct communication at grocery stores in northwest Arkansas. Data gathered from the study were analyzed for descriptive and correlational statistics. Data showed that consumers were less knowledgeable regarding the use of hormones in poultry production, the healthiness of conventionally produced poultry, and the presence of factory farms for poultry production in Arkansas. Consumers were more knowledgeable regarding the affordability of poultry as compared to other meats, the use of antibiotics in poultry production methods, and poultry as a source of food-borne illness. Based on these descriptive and correlational statistics, recommendations were made to maintain the viability of poultry production in Arkansas, including marketing and educational efforts tailored to improve consumer understanding of conventional production practices and the need for further research to better understand the causes of negative perceptions of poultry production.

Introduction

Need for the Study

In Arkansas, poultry production is a valuable part of the state's economy and agricultural landscape. Without the presence of poultry production in Arkansas, a substantial amount of the state economy would be gone, not to mention the substantial amount of jobs that would also be taken away from the market (McGraw, Popp, & Miller, 2012). Just as any other sector of the agriculture industry, poultry production is at its core driven by consumers, who ultimately keep the industry alive through purchasing poultry products. At the present time, research shows that the general public is losing agricultural literacy; that is to say, the public is less knowledgeable about the processes and industry that provide them with their basic nutritional needs (Frick, Birkenholz & Machtmes, 1995; Colbath & Morrish, 2010; Harris & Trexler, 2011). Therefore, it is important that as consumers become less familiar with agriculture in general (and in Arkansas, poultry production), industry and producers understand consumers' perceptions of the industry.

Because poultry production is such a key component to the economy of Arkansas, it is important that research be conducted that will allow for a better understanding of consumer perceptions of poultry production. Recognition and adaptation to consumer opinion will allow poultry production to remain viable. The goal of this research was to identify consumer perceptions of Arkansas poultry production through descriptive survey methodology. This study allows for a clearer knowledge of consumer understanding of the poultry production, which can be instrumental in the sustaining poultry production as a vital part of the Arkansas landscape.

Problem Statement

Although a sufficient amount of research exists to show that the general public is losing agricultural literacy (Frick et al., 1995; Terry & Lawver, 1995; Wachenheim & Rathge, 2000),

little research has been conducted to address consumer perceptions of specific agriculture areas. Because agriculture is a market-chain driven industry that ultimately hinges on the desires of the consumers, it is important that producers and the industry understand the perceptions held by consumers. This will allow for proactive marketing and educational activities tailored to inform and educate consumers. This study identified current perceptions held by consumers of one of the most prominent agricultural industries in Arkansas, namely, poultry production.

Research Questions

The following research questions guided the study:

1. What are the perceptions northwest Arkansas consumers hold about poultry production practices?
2. What are the perceptions northwest Arkansas consumers hold about poultry producers?
3. In the opinion of northwest Arkansas consumers, how important is poultry production to the state?

Objectives

Specific objectives for this study were to:

1. Classify demographics of consumer respondents;
2. Determine the perceptions of northwest Arkansas consumers about selected policies, procedures, and standards used in poultry production;
3. Determine the perceptions of northwest Arkansas consumers' personal preferences and understanding of poultry production; and
4. Estimate correlations between consumer perceptions and demographics.

Definitions

- Agricultural literacy - the possession of “a minimum level of knowledge of the industry which produces and markets food needed for human survival” (Frick et al., 1995, p. 44).
- Consumer - any person who makes decisions regarding the procurement of goods or services (USDA, 2013).
- Poultry - domesticated birds kept for eggs or meat (Merriam-Webster, 2013).
- Poultry production - the process of raising domesticated birds, primarily broiler chickens and turkeys, for consumption (National Chicken Council, 2012).

Literature Review

Arkansas is known for prolific poultry production (Boehler, 2010). With that in mind, the poultry productions’ reach makes it one of the most important parts of the Arkansas agricultural economy and also a significant job creator in the region (McGraw, Popp, & Miller, 2012). In 2010, the poultry production and processing sector in Arkansas contributed 37,343 jobs and \$1.8 billion in added value to the Arkansas economy (McGraw et al., 2012). Arkansas is the second-largest commercial-broiler-producing state in the nation (Boehler, 2010).

Along with the importance of poultry production as an economic engine and job generator in Arkansas, studies also show that chicken is one of the most affordable food products in not only Arkansas, but in the United States. As of 2012, the average annual per capita consumption of chicken was 97.8 pounds (National Chicken Council, 2012). Per capita consumption of poultry increased by 137% between 1965 and 2012 (National Chicken Council, 2012). Even though prices for poultry at the grocery store have experienced a \$30 per capita increase from 1997 to 2007, the increase has been significantly less than other meats like beef,

which had nearly a \$75 per capita increase over the same time period (American Meat Institute, 2009).

There are three types of chicken enterprises: (a) table egg production, (b) broiler production, and (c) raising replacement pullets (Gillespie & Flanders, 2009). Poultry production is designed in such a way that many of the larger companies, known as integrators, operate hatcheries, feed mills, and processing and maintain contracts with the producers that raise animals for their organization (Boehler, 2010). These vertically-integrated poultry firms either own or determine by contracts all parts of the production, processing, and distribution processes. Some of the more prominent integrators headquartered in the state are Tyson Foods, Inc.; OK Foods, Inc.; Simmons Foods, Inc.; Cobb-Vantress, Inc.; and George's, Inc. (Boehler, 2010). Arkansas integrators have designed their processes to be geographically concentrated where all aspects of production are physically located to enhance business logistics (Boehler, 2010). The process begins with hatching chicks at hatcheries owned by the integrators. These chicks are then shipped to the various contract growers – some for broiler production and others for replacement production. Once integrators deliver chicks to farmers, they continue to retain title to the birds and provide feed and veterinary services for the animals (Boehler, 2010).

Since approval by FDA in 1951, use of antibiotics has been instituted in the feeding regimens of modern poultry production methods to prevent diseases in birds that ingest antibiotics, which results in increased growth (Jones & Ricke, 2003). In fact, over 30 antimicrobials are approved for use in U.S. feed for commercial broiler operations; these antimicrobials treat and prevent the spread of diseases like coccidiosis and allow for improved growth (Jones & Ricke, 2003). The National Antimicrobial Resistance Monitoring System has monitored development of animal pathogen resistance in response to use of antibiotics in poultry

production since 1996, and development of resistance patterns during the monitoring period have been relatively low and stable (Jones & Ricke, 2003). The use of hormones in poultry production is prohibited and subsequently monitored by the federal government (Donoghue, 2003).

Regarding the use of antibiotics in the U.S. food supply, “the FDA and USDA provide extensive regulatory oversight to ensure the safety of our food supply” (Donoghue, 2003, p. 620). This is accomplished through a mandatory and stringent antibiotic approval process and continued monitoring after introduction to the market. Federal monitoring reveals few, if any, violations in the amount or kind of antibiotic residues present in poultry tissues. Poultry accounts for 9.8% of the foods that serve as carriers for bacteria, chemicals, parasites, and viruses that cause foodborne illnesses poultry accounts for 9.8%, well below the largest attribution percent of 22.3%, which is attributed to leafy vegetables (Painter et al., 2013).

Because of the importance of poultry production, and agriculture in general, a strong case can be made for consumer awareness of agricultural systems (Terry, 2004). The level of consumer knowledge about agriculture possesses is known as agricultural literacy, and it is vital to the relationship between producer and consumer (Frick et al., 1995). The *National Research Agenda* was created in 2011 to guide research in agricultural education and communications and outlines six areas that serve as priorities for research (Doerfert, 2011). Priority one of the National Research Agenda calls for a research emphasis in public and policy maker understanding of agriculture and natural resources; the agenda specifically calls for scientific focus in the area of “demonstrating the impact of agricultural literacy efforts on a variety of stakeholder behaviors including consumer behavior” (Doerfert, 2011, p. 8). Research focus in

this area will ameliorate the negative impact associated with an uninformed population (Doerfert, 2011).

A number of studies have been conducted to analyze the amount of knowledge the public holds about agriculture in general and to assess the perception citizens have of agriculture. Much of the research about agricultural perceptions shows that consumers are losing literacy the farther they are generationally removed from the farm. Frick et al. (1995) conducted pilot research to assess rural and urban adult knowledge and perceptions of agriculture, revealing that respondents living on farms were more knowledgeable about agriculture than their rural non-farm neighbors, who were more knowledgeable than their urban counterparts. Terry and Lawver (1995) as well as Colbath and Morrish (2010) researched university students' perceptions of issues related to agriculture. Terry and Lawver's (1995) study conducted on university students showed that students held favorable views of food safety, but students in the agricultural programs held more favorable views than those students not in the agricultural programs. The research conducted by Colbath and Morrish (2010) found that freshmen at one central Texas university knew little about an industry that is vital to the state economy. Wachenheim and Rathge (2000) probed the societal perceptions of agriculture so as to understand how those perceptions apply to agricultural economics, noting as producers and consumers continue to be separated tensions between the two parties will continue to grow. Harris and Trexler (2011) conducted research to understand the level of agricultural literacy in elementary school students and found that elementary students understand where their food comes from (i.e. farms), but lacked "essential sub-concepts preventing them from developing schema needed for understanding agricultural and science educational benchmarks" (Harris & Trexler, 2011, p. 159).

Theoretical Framework

It is important to have some understanding of what drives consumers to be active in the market. The theory of reasoned action states that human actions are guided by three considerations: (a) beliefs about the consequences of an action (behavioral beliefs), (b) beliefs about the normative expectations of others (normative beliefs), and (c) beliefs about the presence of factors that may promote or hinder the behavior (control beliefs) (Ajzen & Fishbein, 1980). Consumers who believe there will be negative consequences associated with eating poultry will be less likely to purchase poultry (McEachern & Schroder, 2002). Consumers with family and peers who do not eat poultry will also be less likely to purchase it. Finally, consumer behavior will be affected by consumer beliefs about the availability of poultry products in the area. Research also shows that “women shoulder the majority of shopping responsibility” and the association between gender and shopping responsibility is especially high in regard to grocery shopping (Dholakia, 1999, p. 158). Consumers are also primarily divided into low-involvement and high-involvement groups, meaning those consumers with a low-involvement mindset focus on tangible considerations (e.g. price and visual characteristics), and highly involved consumers consider intangible attributes when making purchases (e.g. safety, health, animal welfare, and biodiversity) (McEachern & Schroder, 2002).

Summary of Literature

A substantial amount of research has been conducted to better understand the general public’s loss of agricultural literacy (Frick et al., 1995; Terry & Lawver, 1995; Wachenheim & Rathge, 2000). However, little research has been conducted to assess consumer perceptions of specific areas of agriculture. Through identifying current perceptions held by consumers of poultry production in Arkansas, this study revealed areas in which consumers possessed or

lacked agricultural literacy in regard to poultry production. Based on the information revealed through this study, marketing and educational recommendations were made to better improve consumer agricultural literacy.

Methods and Procedures

Research Questions (repeated)

The following research questions guided the study:

1. What are the perceptions Arkansas consumers hold about poultry production practices?
2. What are the perceptions Arkansas consumers hold about poultry producers?
3. How important do Arkansas consumers feel that poultry production is to the state?

Objectives (repeated)

Specific objectives for this study were to:

1. Determine demographics of consumer respondents;
2. Determine the perceptions of Northwest Arkansas consumers about selected policies, procedures, and standards used in poultry production;
3. Determine the perceptions of Northwest Arkansas consumers personal preferences and understanding of poultry production; and
4. Determine correlations between consumer perceptions and demographics.

Research Design

This study used a descriptive survey methodology. The statistical analysis was descriptive in nature and the instrumentation followed Dillman's (2007) Tailored Design method to ensure accurate question development.

Population

The population for this study was consumers in Fayetteville, Springdale, and Bentonville, Arkansas. A stratified random sample of grocery stores was selected, from which 353 respondents were interviewed with 198 agreeing to participate through direct contact at five different local chain grocery stores; these stores were selected on a random basis from 10 stores present in these three cities. The researcher and an assistant administered the survey on 14 different occasions between 26 February 2013 and 18 April 2013 to consumers through direct distribution of the instrument. A comprehensive list of survey times and locations can be found in Table 1. A draft of the Internal Review Board research approval is located in Appendix 1.

Table 1

Sampling dates, locations, and duration (N =14)

| Sampling Date and Store Location | Sampling Duration |
|--|--------------------------|
| 26 February; 1189 N. Garland, Fayetteville, AR | 3 to 5 p.m. |
| 4 March; 1189 N. Garland, Fayetteville, AR | 9 to 11:30 a.m. |
| 12 March; 1780 N. Crossover, Fayetteville, AR | 4 to 6 p.m. |
| 14 March; 1780 N. Crossover, Fayetteville, AR | 4 to 5:15 p.m. |
| 26 March 2013; 2894 W. Sunset Avenue, Springdale, AR | 4 to 6 p.m. |
| 28 March 2013; 2894 W. Sunset Avenue, Springdale, AR | 4 to 5:30 p.m. |
| 3 April 2013; 1780 N. Crossover, Fayetteville, AR | 1 to 3 p.m. |
| 4 April 2013; 1945 Butterfield Coach Road, Springdale, AR | 4:15 to 5:30 p.m. |
| 8 April 2013; 2894 W. Sunset Avenue, Springdale, AR | 4 to 5:30 p.m. |
| 9 April 2013; 110 Midtown Center, Bentonville, AR | 4 to 6 p.m. |
| 10 April 2013; 1189 N. Garland, Fayetteville, AR | 1 to 3 p.m. |
| 11 April 2013; 110 Midtown Center, Bentonville, AR | 4 to 6 p.m. |
| 17 April 2013; N. Crossover, Fayetteville, AR | 1 to 2 p.m. |
| 18 April 2013; 110 Midtown Center, Bentonville, AR | 4 to 6 p.m. |

Instrumentation

A printed survey instrument was developed based on a review of literature (Frick et al., 1995; Terry & Lawver, 1995; Wachenheim & Rathge, 2000). A copy of the instrument can be found in Appendix 2. The survey consisted of three parts: (a) a section that assessed consumer perceptions of poultry production in Arkansas, (b) a section that assessed consumer perceptions of knowledge of poultry production, and (c) a demographic section.

Part I of the questionnaire contained 13 statements to assess consumer perceptions of selected aspects of poultry production. Seven of these statements assessed consumer perceptions of policies, procedures, and standards used in poultry production. The remaining six statements in this section assessed consumer preferences and personal understanding of poultry production in Arkansas. These responses corresponded to a Likert-type scale with “strongly disagree” being 1 and “strongly agree” being 6.

Part II of the instrument contained statements and questions to assess respondents’ perceived knowledge of and family employment in Arkansas poultry production. First, this section included the statement “I am very knowledgeable about poultry production practices” to assess how respondents perceived their knowledge of poultry production; answers followed the same scale as the previous perception statements. Next, respondents answered the question “Do you or does anyone in your immediate family work in poultry production?” with either a “yes” or “no” response. Finally, an open-response item asked respondents, “Of all 50 states, where does Arkansas rank in the total dollar value of poultry produced?”

Part III of the survey consisted of questions related to demographics of the surveyed participants. Questions about age, ethnicity (Native American, Black/African-American, Hispanic, Caucasian, Asian, other), gender, and area of residence (farm, rural, suburb, city), and what is the highest degree or level of school you have completed (12th grade or less, no diploma; high school graduate or GED; some college, no degree; associate degree; bachelor’s degree (e.g. BA, BS, AB); graduate or professional degree; don’t know; refused) were all present on this part of the instrument.

Validity and Reliability

Face and content validity of the instrument were assessed by a panel of five faculty members with expertise in survey research methods (2 faculty) and poultry science (3 faculty); these experts recommended minor revisions and deemed the revised instrument to be valid. The revised instrument was pilot-tested by interviewing a convenience sample of 10 respondents at a civic organization in Northwest Arkansas. To determine instrument stability, the survey was administered twice (at a 14 day interval) to a convenience sample of 10 adults in the Northwest Arkansas area. The agreement percentage between the first and second administrations was assessed for acceptability, and stability for the instrument was 0.80 (Gall, Gall, & Borg, 2006).

Instrument reliability was assessed and ranged from low to moderate: for the statements assessing perceptions regarding procedures and policies in poultry production ($r = 0.48$), for statements assessing personal preference and understanding of poultry production ($r = 0.83$), for statements assessing knowledge ($r = .72$), for the demographic section of the instrument ($r = .99$). The low reliability regarding statements assessing procedures and policies in poultry production can be attributed to the wide range of consumer knowledge regarding poultry production practices, particularly the use or absence of hormones and antibiotics in production methods (McEachern & Schroder, 2002). Nunnally (1967), states that a modest reliability of .60 or .50 is sufficient during early stages of research.

Data Collection

To collect data for this research, a researcher and a trained assistant interviewed consumers individually at local grocery stores in northwest Arkansas. After determining stores at which to interview, the researcher contacted the corporate offices of the grocery store chain

and received permission to interview consumers at the chosen stores. Before interviewing at each store location, the researcher called the store manager to inform him or her that the researcher would be conducting interviews at a specific time. The researcher and an assistant spent approximately two hours interviewing individuals in each store during each session. Interviews were conducted near the meats or butcher section of the stores.

Procedure for Data Analysis

Data from the completed surveys were entered into an Excel spreadsheet. This data were then imported into SAS© 9.3 (Carry, NC) and analyzed using descriptive and correlational statistics. Open-ended responses were analyzed using open coding methods (Creswell, 2007; Glense, 2006; Strauss & Corbin, 1990).

Findings and Results

A descriptive survey was employed to collect data about the perceptions of consumers concerning poultry production in Arkansas. The method chosen, along with the supporting literature described in the literature review, served as a strong foundation for the results detailed in this section. Results contained in this section correlate to the survey sections, namely: consumer perceptions of selected policies, procedures, and standards in poultry production; consumer perceptions about personal preferences and understanding of poultry production; consumer knowledge section; and the demographic section.

Demographics

The mean age of respondents was 49.5 years ($SD = 16.98$), ranging from 19 to 92 years. Most consumers surveyed lived in an urban area (54.3%). In regard to education level, 12.2% of respondents possessed a high school education or less, 44.4% of respondents had an associate

degree or some college but no degree, and 43.4% of respondents possessed a bachelor's degree or higher. The majority of respondents were women (65.2%).

The demographics of the cities chosen were compared with the demographics assessed in this research. In 2010, 5.0% of the Fayetteville population was aged 45 to 49 years; 5.9% of the Springdale population was aged 45 to 49 years; 6.8% of the Bentonville population was aged 45 to 49 years (U.S. Census, 2010). In regard to education level of the three cities, 91.7% of the population of Fayetteville were high school graduates or higher and 43.8% of the population possessed a bachelor's degree or higher; 69.7% of the population of Springdale were high school graduates or higher and 17.3% of the population possessed a bachelor's degree or higher; 90.1% of the population of Bentonville were high school graduates or higher and 36.3% possessed a bachelor's degree or higher (U.S. Census, 2010). The percentage of female persons in Fayetteville, Springdale, and Bentonville were 49.7%, 50.3%, and 51.0%, respectively (U.S. Census, 2010).

Consumer Perceptions

Respondents were first assessed for their perceptions about poultry production in Arkansas regarding policies, procedures, and standards in poultry production (Table 2). Consumers agreed that poultry was more affordable than beef or pork ($M = 4.81$, $SD = 1.09$). Consumers believed it was healthier to eat organically produced poultry than conventionally produced poultry ($M = 4.47$, $SD = 1.39$). When asked about their perception of hormone and antibiotic use in poultry production, consumers disagreed that hormones and antibiotics were never given to poultry during production ($M = 1.91$, $SD = 1.05$; $M = 1.84$, $SD = .96$, respectively). Consumers were unsure as to whether conventionally produced poultry contained unsafe levels of hormones or antibiotics ($M = 3.68$, $SD = 1.45$). Respondents disagreed that

Table 2

Consumer Perceptions of Policies, Procedures, and Standards Used in Poultry Production and Correlations among Statements and Demographic Characteristics

| Statement | <i>M</i> | <i>SD</i> | <u>Correlations among Statements and Demographic Characteristics</u> | | | | | |
|---|----------|-----------|--|-----------------------------------|------------------|--------------------------------|------------------------|---------------------|
| | | | Knowledge ^a | Industry Affiliation ^b | Age ^a | Area of Residence ^c | Education ^c | Gender ^b |
| Poultry is more affordable than beef or pork. | 4.81 | 1.09 | -0.01 | 0.11 | 0.21** | 0.04 | 0.00 | -0.04 |
| It is healthier to eat organically produced poultry than conventionally produced poultry. | 4.47 | 1.39 | -0.06 | 0.05 | -0.12 | -0.05 | -0.09 | -0.04 |
| Hormones are never given to poultry. | 1.91 | 1.05 | 0.13 | 0.07 | -0.07 | 0.05 | -0.12 | -0.15* |
| Antibiotics are never given to poultry. | 1.84 | 0.96 | 0.03 | 0.05 | 0.08 | -0.10 | -0.11 | -0.12 |
| Conventionally produced poultry contains unsafe levels of hormones or antibiotics. | 3.68 | 1.45 | 0.15 | -0.02 | 0.08 | 0.02 | -0.09 | 0.19** |
| Eating poultry is the cause of most food-borne illness. | 2.21 | .99 | 0.04 | -0.05 | -0.12 | -0.09 | -0.07 | 0.15* |
| Most Arkansas poultry is grown on factory farms. | 4.15 | 1.37 | 0.01 | -0.10 | -0.03 | 0.06 | -0.04 | -0.04 |

Analysis: ^aPearson Product-Moment Correlation; ^bPoint Biserial Correlation; ^cSpearman Rank-Order Rho

Note. *N* = 198; Likert Scale used was 1 = Strongly Disagree, 2 = Disagree, 3 = Moderately Disagree, 4 = Moderately Agree, 5 = Agree, 6 = Strongly Agree; Likert Scale for Industry Affiliation was 1 = No, 2 = Yes; Likert Scale for Area of Residence was 1 = Farm, 2 = Rural, 3 = Suburb, 4 = City; Likert Scale for Education was 1 = at least high school graduate, 2 = some college, no degree or associate degree, 3 = Bachelor's degree or higher; Likert Scale for Gender was 1 = Male, 2 = Female

p* < 0.05; *p* < 0.01

poultry was the cause of most food-borne illness ($M = 2.21, SD = .99$). Respondents moderately agreed that most Arkansas poultry is grown on factory farms ($M = 4.15, SD = 1.37$).

Respondent perceptions were also assessed in regard to consumer preferences and personal understanding of poultry production in Arkansas (Table 3). Consumers moderately agreed that poultry producers care about the welfare of the poultry they produce ($M = 4.01, SD = 1.41$). Consumers were unsure if farmers use humane production practices ($M = 3.81, SD = 1.42$). When asked about poultry production's effect on the environment, respondents moderately disagreed that poultry production is harmful to the environment ($M = 2.90, SD = 1.30$). Consumers were unsure if poultry processing employed a large number of illegal immigrant workers ($M = 3.93, SD = 1.36$). Consumers disagreed that if they lived in a rural area, they would like to live near a poultry farm ($M = 2.20, SD = 1.33$). Overall, consumers agreed that poultry production has a positive effect on Arkansas ($M = 4.92, SD = 1.07$).

After respondents were assessed regarding their perceptions of poultry production, they responded to the section of the survey that assessed their perceived knowledge of poultry production. Of the consumers surveyed (32.8%) moderately agreed they were very knowledgeable about poultry production processes. The majority of consumers surveyed did not work in poultry production, nor did any members of their immediate family (81.7%). Most respondents ranked Arkansas tenth or higher in terms of the total dollar value of poultry produced.

Demographic Characteristics and Perception Correlations

Correlations between demographics and perceptions can be found in Tables 2 and 3. All statistically significant correlations between perceptions of poultry production and demographic characteristics were low. It is noteworthy that even though all significant correlations were low,

some small correlations are cause for concern and should be further explored, especially in regard to gender and perceptions about the health of poultry. There was a slight correlation in the data between women and the perception of an unhealthy amount of antibiotics and hormones in conventionally produced poultry ($p = 0.19$).

Table 3

Consumer Perceptions of Personal Preference and Understanding of Poultry Production and Correlations among Statements and Demographic Characteristics

| Statement | <i>M</i> | <i>SD</i> | <u>Correlations among Statements and Demographic Characteristics</u> | | | | | |
|---|----------|-----------|--|-----------------------------------|------------------|--------------------------------|------------------------|---------------------|
| | | | Knowledge ^a | Industry Affiliation ^b | Age ^a | Area of Residence ^c | Education ^c | Gender ^b |
| Poultry producers care about the welfare of the poultry they produce. | 4.01 | 1.41 | -0.04 | 0.16* | 0.08 | -0.03 | -0.08 | -0.03 |
| Poultry farmers use humane production practices. | 3.81 | 1.42 | 0.03 | 0.17* | 0.11 | -0.04 | -0.09 | 0.04 |
| Poultry production is harmful to the environment. | 2.90 | 1.30 | -0.03 | -0.11 | -0.03 | 0.11 | 0.15* | 0.12 |
| Poultry processing employs a large number of illegal immigrant workers. | 3.93 | 1.36 | 0.08 | -0.07 | 0.00 | 0.05 | -0.21** | 0.11 |
| If I lived in a rural area, I would like to live near a poultry farm. | 2.20 | 1.33 | 0.11 | 0.18 | -0.07 | -0.17 | -0.14 | -0.07 |
| Overall, the poultry industry has a positive effect on Arkansas. | 4.92 | 1.07 | 0.04 | 0.09 | 0.10 | -0.10 | -0.05 | -0.11 |

Analysis: ^aPearson Product-Moment Correlation; ^bPoint Biserial Correlation; ^cSpearman Rank-Order Rho

Note. *N* = 198; Likert Scale was 1 = Strongly Disagree, 2 = Disagree, 3 = Moderately Disagree, 4 = Moderately Agree, 5 = Agree, 6 = Strongly Agree; Likert Scale for Industry Affiliation was 1 = No, 2 = Yes; Likert Scale for Area of Residence was 1 = Farm, 2 = Rural, 3 = Suburb, 4 = City; Likert Scale for Education was 1 = at least high school graduate, 2 = some college, no degree or associate degree, 3 = Bachelor's degree or higher; Likert Scale for Gender was 1 = Male, 2 = Female

p* < 0.05; *p* < 0.01

Discussion and Recommendations

Discussion

Of the perceptions assessed in Part I of the instrument, Table 2 related to policies, procedures, and standards used in poultry production. The remaining perceptions-based questions were based largely on consumer preferences and personal understanding of poultry production (Table 3). The amount of agricultural literacy possessed by consumers concerning poultry production in Arkansas varied between these different areas assessed through the descriptive survey methodology employed in this research.

Consumers possessed a higher level of agricultural literacy regarding the affordability of poultry as compared to other meats, the use of antibiotics in poultry production methods, and poultry as a source of food-borne illness. Consumers were fairly knowledgeable about the price of poultry in comparison to other meats, generally agreeing with the valid statement that poultry is more affordable than beef or pork (American Meat Institute, 2009). Consumers were also knowledgeable about antibiotic use in poultry production. The use of antibiotics is legal and utilized in poultry production, and a majority of consumers surveyed were aware of this fact (Jones & Ricke, 2003). Finally, consumers were knowledgeable about poultry serving as a source of food-borne illness; whereas, they generally disagreed that eating poultry is the cause of most food-borne illness (Painter et al., 2013).

Consumers lacked agricultural literacy regarding perceptions of the other policies, procedures, and standards addressed in the survey; namely, consumers lacked knowledge about the healthiness of organic poultry in comparison to conventionally produced poultry, the use of hormones in poultry production, the level of antibiotics and hormones present in conventionally produced poultry, and the use of factory farms in poultry production. Consumers generally

agreed that organically produced poultry is healthier than conventionally produced poultry, but with the strict mandates and regulations enforced by the government concerning food safety in mind, both organically and conventionally produced poultry should possess the same level of health for the consumer. Consumers disagreed with the statement that hormones are never given to poultry, despite the illegality of the use of hormones in poultry production (Donoghue, 2003). In a similar fashion, consumers moderately agreed that conventionally produced poultry contains unsafe levels of hormones or antibiotics. Research supports the notion that the levels of antibiotics produced in conventionally produced poultry are safe, and the level of hormones is nonexistent because of the absence of their use (Donoghue, 2003). Consumers agreed most Arkansas poultry is grown on factory farms, which is in contrast to the truth that most Arkansas poultry farms are owned and operated by producers, not integrators (Boehler, 2010). However, this perception is dependent upon consumer understanding of what a factory farm is, and could simply mean that consumers equate modern production practices with factory farming instead of the ownership of farms by integrators as factory farming.

Regarding the remainder of the perceptions assessed as a part of the instrument, consumers varied in their favorability of poultry production and all it entails in Arkansas. Consumers held moderately favorable views of the level of attention poultry producers give to the poultry they raise, yet consumers were slightly less agreeable that poultry farmers use humane production practices. Consumers were unsure as to whether poultry production is harmful to the environment, but most consumers generally disagreed they would like to live near a poultry farm. Respondents were in general agreement that poultry processing employs a large number of illegal immigrant workers, but because of the lack of research accounting for illegal immigrant workers it is uncertain as to whether this perception matches reality. In a similar

fashion to research conducted by Frick et al. (1995), despite the limited knowledge consumers held of some aspects of poultry production in Arkansas, the majority agreed that poultry production had a positive effect on Arkansas.

Recommendations

It is particularly troubling that consumers in Arkansas show deficiencies in poultry production agricultural literacy, but perhaps it is more troubling that agricultural communicators and educators have not worked to keep consumers better informed about the practices of an industry that is so important to the state. To remedy the lack of agricultural literacy, consumers need to be educated about the health benefits of conventionally produced poultry, the absence of hormones in poultry production, the effects of the use of antibiotics in poultry production, and the business model of poultry production in Arkansas. These proposed educational topics should be addressed through industry marketing efforts aimed at improving consumer knowledge, which will ultimately improve and ensure the importance of poultry production in Arkansas (McGraw et al., 2012). In one way or another, these perceptions weigh heavily on the minds of consumers because of the implications or consequences associated with the actions driven by these perceptions. Improved consumer education efforts must adequately address the topics on which consumers lack agricultural literacy. As consumers become more knowledgeable about these topics they will better understand the consequences associated with their perceptions, thus making more informed purchasing decisions consistent with the theory of reasoned action (Ajzen & Fishbein, 1980). As consumers become more aware through educational and marketing efforts of the absence of negative consequences associated with purchasing poultry they will be more likely to purchase poultry (McEachern & Schroder, 2002). The institution of marketing and

educational materials to improve agricultural literacy is a direct application of this research that falls under priority one of the National Research Agenda (Doerfert, 2011).

Recommendations for communication-based marketing and consumer education were made based on the analysis completed in this study. Consumer education should become a higher priority for the poultry production integrators in Arkansas. One way of effectively improving agricultural literacy about poultry production in Arkansas is through in-store promotional materials. Materials placed in direct contact with consumers at grocery stores showcasing information about poultry production would aid consumers in making informed decisions during their shopping experiences. Previous research noted women are the primary purchasers of groceries (Dholakia, 1999); therefore, marketing efforts should be directed at women. Consumers should especially be advised of the healthiness of conventionally produced poultry, particularly in regard to the use of antibiotics and the absence of hormones in poultry. The availability of this information concerning poultry production practices in Arkansas grocery stores would assist in the process of creating informed consumers by building a strong connection between consumer knowledge and purchases made based on that information.

By expanding research on some of the perceptions contained in the instrument used in this research, understanding of consumer perceptions of the poultry industry can be further improved. In particular, deeper research into negative perceptions of the poultry industry held by consumers would be helpful. For example, research should be conducted to better understand reasons behind negative perceptions of consumers concerning antibiotic and hormone use in poultry production; this research would prove helpful in better targeting the consumers.

By assessing consumer perceptions of poultry production in the state, this study revealed consumer perceptions in regard to a variety of parts of the poultry production. Consumers held

mostly unfavorable perceptions regarding conventional production processes, hiring in poultry processing, and the use of factory farms to produce poultry; however, consumers viewed poultry as a more inexpensive food source, and also perceived poultry production as having an overall positive influence on the state. The perceptions found in this study should be used to more effectively tailor marketing and education efforts to maintain the importance of poultry production in Arkansas through improving agricultural literacy (Frick et al., 1995).

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Appendix 1: IRB Approval Letter

February 18, 2013

MEMORANDUM

TO: Stuart Estes
Leslie Edgar

FROM: Ro Windwalker
IRB Coordinator

RE: PROJECT MODIFICATION

IRB Protocol #: 12-12-345

Protocol Title: *Consumer Perceptions of Poultry Production in Arkansas*

Review Type: EXEMPT EXPEDITED FULL IRB

Approved Project Period: Start Date: 02/18/2013 Expiration Date: 01/16/2014

Your request to modify the referenced protocol has been approved by the IRB. **This protocol is currently approved for 400 total participants.** If you wish to make any further modifications in the approved protocol, including enrolling more than this number, you must seek approval *prior to* implementing those changes. All modifications should be requested in writing (email is acceptable) and must provide sufficient detail to assess the impact of the change.

Please note that this approval does not extend the Approved Project Period. Should you wish to extend your project beyond the current expiration date, you must submit a request for continuation using the UAF IRB form "Continuing Review for IRB Approved Projects." The request should be sent to the IRB Coordinator, 210 Administration.

For protocols requiring FULL IRB review, please submit your request at least one month prior to the current expiration date. (High-risk protocols may require even more time for approval.) For protocols requiring an EXPEDITED or EXEMPT review, submit your request at least two weeks prior to the current expiration date. Failure to obtain approval for a continuation *on or prior to* the currently approved expiration date will result in termination of the protocol and you will be required to submit a new protocol to the IRB before continuing the project. Data collected past the protocol expiration date may need to be eliminated from the dataset should you wish to publish. Only data collected under a currently approved protocol can be certified by the IRB for any purpose.

If you have questions or need any assistance from the IRB, please contact me at 210 Administration Building, 5-2208, or irb@uark.edu.

Appendix 2: Consumer Perception of the Poultry Industry Interview Instrument

Read this script to potential respondents to determine their willingness to participate in the interview. Agreeing to be interviewed will constitute evidence of implied consent.

Hello my name is Stuart Estes, and I am an Honor's student in the Department of Agricultural and Extension Education at the University of Arkansas. I am conducting a study to learn about consumers perceptions of the Arkansas poultry production industry.

Before I begin, this interview is completely voluntary and all information collected will be kept confidential to the extent allowed by law and University policy. There are no risks for completing this survey. If I ask you something you do not feel you can answer, just let me know and we will move on. This survey will take approximately 5 minutes. Are you willing to participate?

_____ YES _____ NO

These first questions are intended to determine the perceptions you hold of poultry production in Arkansas. For each statement, please tell me whether you:

(Hand out printed card now)

*Strongly Disagree
Disagree
Moderately Disagree
Moderately Agree
Agree
Strongly Agree*

Do you have any questions before I read the first statement?

OK, I'll begin with the first statement:

- | | | | | | | |
|--|----|---|----|----|---|----|
| 1. Poultry is more affordable than beef or pork. | SD | D | MD | MA | A | SA |
| 2. It is healthier to eat organically produced poultry than conventionally produced poultry. | SD | D | MD | MA | A | SA |
| 3. Hormones are never given to poultry. | SD | D | MD | MA | A | SA |
| 4. Antibiotics are never given to poultry. | SD | D | MD | MA | A | SA |
| 5. Conventionally produced poultry contains unsafe levels of hormones or antibiotics. | SD | D | MD | MA | A | SA |
| 6. Eating poultry is the cause of most food-borne illness. | SD | D | MD | MA | A | SA |
| 7. Poultry producers care about the welfare of the poultry they produce. | SD | D | MD | MA | A | SA |
| 8. Poultry farmers use humane production practices. | SD | D | MD | MA | A | SA |
| 9. Poultry production is harmful to the environment. | SD | D | MD | MA | A | SA |
| 10. Poultry processing employs a large number of illegal immigrant workers. | SD | D | MD | MA | A | SA |

- | | | | | | | |
|---|----|---|----|----|---|----|
| 11. Most Arkansas poultry is grown on factory farms. | SD | D | MD | MA | A | SA |
| 12. If I lived in a rural area, I would like to live near a poultry farm. | SD | D | MD | MA | A | SA |
| 13. Overall, the poultry industry has a positive effect on Arkansas. | SD | D | MD | MA | A | SA |

Now I'd like to ask you a few questions about your knowledge of poultry production.

I am very knowledgeable about poultry production practices.

SD D MD MA A SA

Do you or does anyone in your immediate family work in poultry production?

_____ YES _____ NO

Of all 50 states, where does Arkansas rank in the total dollar value of poultry produced?

If you don't mind, I'd like to finish by asking you just a couple of demographic questions.

Please tell me your age _____

Indicate your area of residence

_____ Farm _____ Rural _____ Suburb _____ City

(Ask respondents to flip card to see education options.)

What is the highest degree or level of school you have completed?

| | |
|--|---------------------------------------|
| _____ 12 th grade or less, no diploma | _____ High school graduate or GED |
| _____ Some college, no degree | _____ Associate degree |
| _____ Bachelor's degree (eg. BA, BS, AB) | _____ Graduate or professional degree |
| _____ Don't know | _____ Refused |

Note ethnicity:

_____ Native American _____ Black/African American _____ Hispanic
 _____ Caucasian _____ Asian _____ Other

Note gender: _____ Male _____ Female

Thank you very much for taking the time to talk with me and for your contribution to my study.