
Consumer Perceptions of Livestock Products and Animal Welfare

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Executive Summary:

Researchers conducted an online survey of 798 United States consumers to characterize smoked ham and lunchmeat purchasing behaviors and consumers' views of animal welfare and food safety attributes across a variety of animal species and livestock products. Animal welfare and food safety concerns differed by animal species, as well as the individual product in question, even if those products came from the same species of animal. Most participants were reportedly concerned about food safety and animal welfare attributes in staple products, such as milk, eggs and ground beef. Fourteen percent of respondents indicated they had reduced their overall pork consumption in the past three years due to animal welfare and handling concerns. Inconsistencies were found when consumers were asked which lunchmeat attributes they associated with high quality and which attributes they actually consider during lunchmeat purchases. More than 73 percent of respondents indicated they agreed that “produced on farms with animal welfare and handling standards in place” and “produced by farmers certified in animal welfare techniques” were associated with higher quality lunchmeats; of those purchasing lunchmeat, only 47 and 45 percent of respondents, respectively, reported considering these attributes during purchase.

Keywords: consumer preferences; animal welfare; pork production; product attributes

Introduction

Evidence that consumers care about the production practices used to produce their food is abundant; it can be found on food labels, in restaurant advertisements and media stories. Livestock products are of particular interest to consumers with regards to livestock treatment and animal welfare (Frewer, Kole, Van de Kroon and de Lauwere, 2005). Therefore, it is no surprise that special interest groups, such as the Humane Society of the United States (HSUS) and People for the Ethical Treatment of Animals (PETA), have such a large following. Agricultural industries base their practices on science, but are often viewed as slow to adapt, adopt and implement new findings. However, livestock industries can no longer ignore the desire for increased choice in food production methods as a result of growing affluence of consumers. Further, they cannot dismiss consumer interests and changing consumer demand in the marketplace, whether based on emotions, ethics or science, regarding the methods used to produce food.

The pork industry has been a major focus for animal well-being debates, specifically with concern surrounding gestation crates (Norwood, 2011; Tonsor, Wolf and Olynk, 2009). Multiple avenues have been pursued, including ballot initiatives (Florida, Arizona and California) and state legislation (Oregon, Colorado, Maine and Michigan) to ban gestation crates (Norwood and Lusk, 2011). Additionally, a number of corporations have publically announced timelines in which their suppliers must be gestation crate free (i.e., McDonalds (HSUS, 2012b) and Kroger (HSUS, 2012a)). Examples of these “politics by other means” (Schweikhardt and Brown, 2001), using the market instead of legislation to achieve political goals, are increasingly abundant. However, it is still unclear whether there is a national consensus regarding animal well-being (Tonsor and Wolf, 2010), leaving many producers and livestock supply chain members questioning how to remain competitive moving forward. Croney (2011) concludes, “Animal agriculture cannot ignore consumer perceptions in deriving policies or practices pertaining to farm animal care.” Research is needed to better understand consumers’ perceptions and purchasing behavior of livestock products.

The U.S. has the highest annual meat consumption per capita, 221 pounds (USDA, 2012), which is three times the global average (Daniel et al., 2011). The USDA (2012) forecasts that red meat and poultry per capita consumption will fall to 198 pounds in 2013, but will rise to 213 pounds over the remainder of their projection period to 2021. Since meat plays such a large part in Americans’ diets, it is important to understand their perceptions of livestock products and the practices used to rear the livestock animals that produce those products. Most studies surrounding perceptions of livestock products and practices have focused on higher value or less processed products, such as pork chops (Olynk, Tonsor and Wolf, 2010), beefsteak (Gao and Schroeder, 2009) and milk (Wolf, Tonsor and Olynk, 2011). However, many Americans’ busy schedules demand convenient foods, whether for home consumption or through increased spending in restaurants and fast food establishments (Stewart, Blisard and Jolliffe, 2006). Processed meat accounts for 22 percent of total red meat and poultry consumption, and the average American consumes processed meat more than 50 times per year (Daniel et al., 2011). Therefore, it is imperative to understand variation in consumer perceptions across products from different animal species, as well as products with various levels of processing, even products from the same animal.

Past analyses have found evidence for varying levels of affinity for different livestock species, as well as varying consumer preferences for animal welfare enhancing practices, depending on the specific product in question. Evidence was found by Olynk, Tonsor and Wolf (2010) that consumer willingness to pay for verified production process attributes differed across livestock species when comparing milk and pork chops. Additionally, they found differences in social desirability bias across species, potentially indicating that consumers have a higher sentiment for cows than pigs (Olynk, Tonsor and Wolf, 2010). Statistical differences in willingness to pay were found in all but one of the verified attributes when comparing ice cream and yogurt, with consumers having a higher willingness to pay for yogurt attributes than ice cream attributes (Olynk and Ortega, 2013). Although yogurt and ice cream are both made from milk, which comes from a dairy cow, consumers value the same attributes differently across products (Olynk and Ortega, 2013). Clearly, consumer preferences for livestock animal rearing practices are not homogenous, even for the same consumer, but vary across species and the products produced by those species.

The crux of this analysis relies on tying together attributes that are potentially linked in consumers' minds, including animal welfare and food and nutrition information. These perceptions vary not only from consumer to consumer, but also across species and the product in question. The objectives of this analysis are to characterize the purchasing and consumption patterns of pork and livestock products, including lunchmeat and smoked ham; to summarize consumers' reported perceptions/concerns of livestock production, especially animal welfare and food safety concerns; and to inform livestock producers and the supply chain regarding implications of these findings. This manuscript proceeds with a brief overview of data collection and summary statistics, then continues with results and discussion about consumer food purchasing behaviors and perceptions of animal welfare and food safety across products. The article concludes with a summary of significant findings regarding consumer perceptions of livestock products and possible implications.

Research Methods and Data

Survey Instrument

An online survey was administered in June 2012 to a representative sample of U.S. households to collect information about smoked ham and ham lunchmeat purchasing and shopping characteristics, consumers' perceptions of pork production and views on food safety and animal welfare of various livestock products. A total of 798 respondents completed the survey.

Decipher Inc., a marketing research services provider that specializes in online survey programming, data collection, data processing and custom technology development, was used to administer the survey. A large opt-in panel by Survey Sampling International was used to recruit participants. The sample was recruited to be representative of the U.S. population in terms of state of residence, gender, age, pre-tax income and education level. Additionally, respondents were required to be at least 18 years of age and familiar with their household's food purchasing behaviors. Answers provided to respondents throughout the survey were randomized to lessen ordering effects on responses. Data analysis tools offered on the Decipher Inc. website were used to calculate cross tabulations and z-scores that are used to make comparisons throughout the paper. Results of cross tabulations referenced in this analysis are presented in detail in Appendix 1.

Internet surveys are becoming more popular because of their low costs and quick completion times (Louviere et al., 2008; Gao and Schroeder, 2009; Olynk, Tonsor and Wolf, 2010; Tonsor and Wolf, 2010; Olynk and Ortega, 2013). Hudson et al. (2004) found that Internet surveys did not exhibit nonresponse bias. Correspondingly, Fleming and Bowden (2009) and Marta-Pedroso, Freitas and Domingos (2007) found no significant differences when comparing results of web-based surveys, conventional mail and in-person interview surveys.

Sample Summary Statistics and Demographics

Demographics from the sample of 798 participants are detailed in Table 1. The mean age of survey respondents was 47, and 48 percent of respondents were male. On average, there were 1.93 adults and 0.50 children reported per household. When income was converted to a continuous variable, the mean household income was \$49,223. According to the U.S. Census Bureau the median 2011

household income in the U.S. was \$50,054 (DeNavas-Walt, Proctor and Smith, 2012). Our sample was found to be slightly more educated than the U.S. average, with 97 percent graduating high school and 33 percent receiving a bachelor’s degree or higher. In 2010, 87 percent of Americans over the age of 25 were at least a high school graduate and 30 percent had completed at least four years of college (U.S. Census Bureau, 2012).

Whether or not respondents consume animal products, specifically meat or milk, is of interest given the focus of the survey instrument on livestock product consumption patterns. A 2008 study released by “Vegetarian Times” stated that 3.2 percent of American adults consider themselves vegetarian and 0.5 percent vegan; additionally, they reported that 10 percent of adults “largely follow a vegetarian-inclined diet.” In this study, 4 percent of respondents categorized themselves as vegetarians and 2

percent vegan. Olynk and Ortega (2013) found similar results where 5 percent of the participants classified themselves as a vegetarian and 2 percent vegan. Life events and health conditions that may alter food purchasing behaviors were also of interest—41 (5 percent) households have had a pregnant member in the past year, 294 (37 percent) households have a member with high blood pressure, 106 (13 percent) households have had a member lose a job in the past six months, and 254 (32 percent) households have experienced serious financial distress in the last six months.

Familiarity with animals, of any species, has the potential to influence how people view livestock animals, as well as meat, milk and egg production. A total of 530 (66 percent) households in the sample owned animals. The most commonly owned animals were dogs, with 386 (48 percent) households, followed by cats, with 324 (41 percent) households owning cats. Only 20 (3 percent) households owned horses. An assortment of other animals were owned by 80 (10 percent) households; among the most common were rabbits, turtles, fish, birds, chickens, ferrets and other reptiles.

Table 1. Sample summary statistics (n=798)

Variable	Value
Mean age of respondents	47
Male	48%
Adults living in household	1.93
Total children living in household (mean)	0.50
▪ Children under 3 years	0.10
▪ Children ages 4 to 6	0.07
▪ Children ages 7 to 9	0.08
▪ Children ages 10 to 12	0.08
▪ Children ages 13 to 15	0.10
▪ Children ages 16 to 18	0.07
Household Income	
▪ Less than \$20,000	19%
▪ \$20,000 - \$39,999	31%
▪ \$40,000 - \$59,999	22%
▪ \$60,000 - \$79,999	12%
▪ \$80,000 - \$99,999	7%
▪ \$100,000 - \$119,999	3%
▪ \$120,000 or more	6%
Education	
▪ Did not graduate from high school	3%
▪ Graduated from high school, Did not attend college	23%
▪ Attended College, No Degree earned	26%
▪ Attended College, Associates or Trade Degree earned	14%
▪ Attended College, Bachelor's (B.S. or B.A.) Degree earned	23%
▪ Graduate or Advanced Degree (M.S., Ph.D., Law School)	10%
▪ Other	1%
Race	
▪ White, Caucasian	81%
▪ Black, African American	9%
▪ Asian, Pacific Islander	4%
▪ Mexican, Latino	4%
▪ American Indian	1%
▪ Other	2%
Political Affiliation	
▪ Democratic Party	35%
▪ Republican Party	25%
▪ Independent	30%
▪ None of the above	11%

Results and Discussion

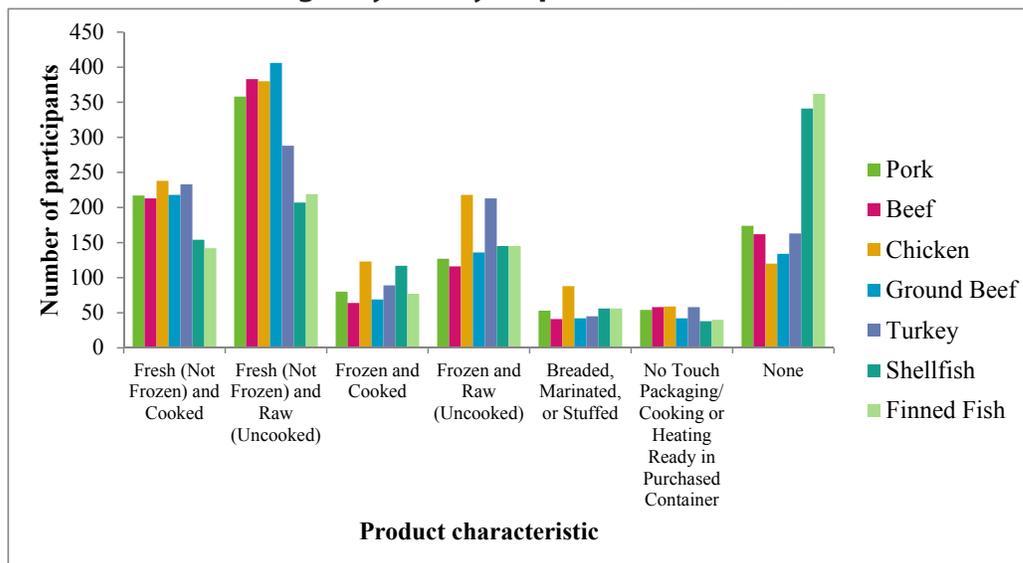
Household Expenditures and Meat Preparation Preferences

The average weekly household food expenditure in this study was \$132.77, including at-home consumption, restaurants and takeout. According to the Bureau of Labor Statistics (2012), in 2011, the average American household's yearly food expenditure was \$6,458 or approximately \$124 weekly¹. Therefore, participants in our study spent slightly more on their weekly food expenditures than the average U.S. household, but this may be due to the fact that our sample was more educated and more affluent than the average American.

Today's grocery store shelves offer consumers numerous packaging and preparation options. Would consumers be willing to increase their food expenditures if the products available had the attributes, including packaging attributes, they desired? Participants were asked what product characteristics they look for when buying different meats. Figure 1 shows that the most commonly selected product characteristic was fresh (not frozen) and raw (uncooked) for pork (45 percent), beef (48 percent), chicken (47 percent), ground beef (51 percent) and turkey (36 percent). However, for shellfish (43 percent) and finned fish (45 percent), most participants did not seek any of the characteristics in question. Respondents also often selected chicken and turkey that was fresh (not frozen) and cooked, as well as frozen and raw (uncooked).

Participants were asked to directly state how much they were willing to pay per

Figure 1. Product characteristics reportedly sought by survey respondents (n= 798)^a



^a Participants could select all that apply, unless none was selected.

¹ Bureau of Labor Statistics (2012) reported the annual spending of \$6,458 for the average household. Assuming that the annual spending was evenly allocated throughout the year, the weekly expenditure reported here was calculated by simply dividing the \$6,458 evenly over 52 weeks.

pound to not have to touch or handle raw pork, beef, chicken and seafood. For pork, 522 (65 percent) respondents were not willing to pay anything, 115 (14 percent) were willing to pay \$0.10 or less per pound, 80 (10 percent) 0.11 to \$0.20 per pound, 35 (four percent) 0.21 to \$0.30 per pound and 48 (6 percent) more than \$0.30 per pound. For beef, 516 (65 percent) respondents were not willing to pay anything, 110 (14 percent) were willing to pay \$0.10 or less per pound, 88 (11 percent) 0.11 to \$0.20 per pound, 37 (5 percent) 0.21 to \$0.30 per pound and 49 (6 percent) more than \$0.30 per pound. For chicken, 502 (63 percent) respondents were not willing to pay anything, 111 (14 percent) were willing to pay \$0.10 or less per pound, 95 (12 percent) 0.11 to \$0.20 per pound, 37 (5 percent) 0.21 to \$0.30 per pound and 55 (7 percent) more than \$0.30 per pound. For seafood/fish, 544 (68 percent) respondents were not willing to pay anything, 102 (13 percent) were willing to pay \$0.10 or less per pound, 75 (9 percent) 0.11 to \$0.20 per pound, 30 (4 percent) 0.21 to \$0.30 per pound and 49 (6 percent) more than \$0.30 per pound. Therefore, for each meat in question, over 60% of consumers were not willing to pay additional money to avoid handling raw meat. However, a sizeable number of consumers would still be willing to pay to not handle raw meat. Overall, participants specified that they were willing to pay the most to not have to handle raw chicken and the least to not handle or touch seafood/fish, compared to the other meats evaluated.

Participants were asked if they primarily consume pork at home, in restaurants or if they did not consume pork. Survey participants most commonly consumed pork at home (78 percent), 13 percent consumed pork at restaurants and 9 percent indicated they did not consume pork. Of the 13 percent (n=105) of respondents that stated they were more likely to consume pork at a restaurant than at home, the most common reasons were “I only eat pork for special occasions,” 30 percent (n=32), and “I do not know how to cook pork,” 29 percent (n=30)². “I am the only person in my household that eats pork” was acknowledged as a reason for eating pork at restaurants by 25 percent (n=26), “I do not feel I can safely cook raw pork” by 21 percent (n=22) and “I do not like handling raw pork” by 19 percent (n=20). Other reasons, cited by 13 percent (n=14), for eating pork at restaurants included convenience, not cooking many meals at home and finding better quality meat at restaurants.

These results indicate that there is probable demand for new (or more) packing and preparation options for meat products. More consumers stated they were willing to pay to not handle or touch raw meat than indicated they used no-touch packaging. Potentially, this difference could be due to prices of no-touch products being higher than the shoppers’ willingness to pay. Therefore, new, more affordable packaging and preparation options should be investigated, especially for chicken. When looking specifically at pork products, demand may be strengthened by marketing pork more for everyday meals, increasing pork options available at restaurants and informing consumers of safe and convenient ways to cook pork products. Survey takers showed the weakest interest in fish and shellfish attributes, with the least number of participants looking for product characteristics when shopping and being willing to pay to not handle or touch raw fish and shellfish. This lack of interest could be related to fewer consumers eating fish and shellfish products on a regular basis. According to the NOAA (2011), the U.S. 2010 per capita fish consumption was only 15.8 pounds, comparatively small to U.S. per capita poultry (100 pounds), beef (59.6 pounds) and pork (47.7 pounds) consumption (USDA, 2012).

2 Participants could select all the answers that applied.

Lunchmeat Purchasing Characteristics

When most people think of lunch, they probably think of a sandwich, which usually involves lunchmeat. Therefore, it is no surprise that the U.S. lunchmeat category posted \$12.6 billion in sales in 2011 (Mintel, 2012). According to our survey results, 88 percent of participants purchase lunchmeat. These results are consistent with those of Mintel, who found that some form of lunchmeat was eaten in 94 percent of their respondent households (Mintel, 2012). The largest percentage, 40 percent, of households in this study purchased lunchmeat a least once per typical week, 26 percent at least once per typical two-week period, and 22 percent at least once per typical month. Of those who purchased lunchmeat in the Mintel survey, 14 percent purchased one time a month, 26 percent two times per month, 16 percent three times per month, 24 percent four times per month and 20 percent five or more times per month (Mintel, 2012). Those who report purchasing lunchmeat in this study are statistically younger than those not indicating lunchmeat purchases, with average age of the survey respondent being 46 and 52 years (sds 1.76, z=3.36), respectively^{3,4}. Households purchasing lunchmeat were also statistically larger households with significantly higher weekly food expenditures than those household that did not purchase lunchmeat, with an average weekly food expenditures of \$137.98 versus \$95.10 (sds 10.07, z=4.26), respectively.

Quantity of lunchmeat consumed by the household in a typical week is shown in Table 2. Of the 701 households indicating they purchase lunchmeat, the majority consume either eight ounces to one pound of lunchmeat or less than 8 ounces of lunchmeat

Table 2. Weekly lunchmeat consumption (n=701)

Weekly Lunchmeat Consumption	Number of Households	Percent of Households
None	9	1%
Less than 8 oz. (8 oz. = ½ lb.)	262	37%
8 oz. to 16 oz. (16 oz. = 1 lb.)	282	40%
1.1 to 2 lbs.	101	14%
More than 2 lbs.	47	7%

per week. More than 20 percent of households that consume lunchmeat reported consuming over one pound of lunchmeat per week; on average, those households consuming more than one pound of lunchmeat per week had significantly larger households (more adults and children), and the survey respondent’s mean age was younger (42 versus 47 years (sds 1.33, z=3.62)), than those consuming less lunchmeat⁵.

The most popular, “first most often purchased” lunchmeat was turkey, followed closely by ham (Figure 2). Ham and turkey were also favorites as “second most often purchased” lunchmeat varieties. These results are comparable to Mintel, which found turkey was consumed in 94 percent of lunchmeat-purchasing households and ham in 92 percent (Mintel, 2012). However, Mintel (2012) found that 83 percent of households in question consume chicken lunchmeat, 79 percent beef and 64 percent bologna, wursts and loaves. These differing results could be due to the fact that this study only asked about the first and second most often purchased lunchmeats,

3 Statistically significant results reported throughout are at significant at five percent or lower.
 4 Cross tabulation results for all analyses cited are available in Appendix 1.
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whereas the Mintel study asked if the lunchmeat variety was consumed at all by the household. Of the lunchmeat consumed by the households in our survey, 76 percent was consumed on a sandwich. Of the remaining 24 percent of lunchmeat consumed, 10 percent was eaten by itself, 6 percent was eaten in a salad, 7 percent was consumed along with a snack, such as a cracker, and 1 percent was consumed in other ways not listed. If participants indicated that they consumed lunchmeat in other ways, they were asked to describe; answers included with eggs, in an omelet, in a wrap and a lunchmeat roll-up without bread.

A variety of packaging options are available when making lunchmeat purchases. Among the 701 (88 percent) participants who indicated their households purchase lunchmeat, it was evenly split between lunchmeat purchased at the deli and prepackaged lunchmeats, as shown in Figure 3. Amongst prepackaged lunchmeat options, the resealable bag was the most common packaging purchased. Mintel (2012)

found that “70 percent of lunchmeat eaters believe that products sold at the deli counter are fresher than prepackaged options.” Furthermore, of those who were from the Northeast region, 72 percent buy lunchmeat from the deli and only 28 percent reported purchasing prepackaged lunchmeat. Only 46 percent of those from the Midwest, 37 percent from the South and 34 percent from the West indicted purchasing lunchmeat from the deli⁶. Therefore, other factors besides freshness might come into play when deciding whether to purchase deli or prepackaged lunchmeats. Potential factors could include geographic availability/norms, price, convenience, deli hours and brand loyalty.

Lunchmeats today offer numerous product attributes, but which of these attributes do shoppers associate with higher-quality lunchmeats? The most participants, 607 (76 percent), agreed that “all natural” indicated high-quality lunchmeat (Figure 4). More than 73 percent of participants agreed

Figure 2. First and second most often purchased variety of lunchmeat (n=701)

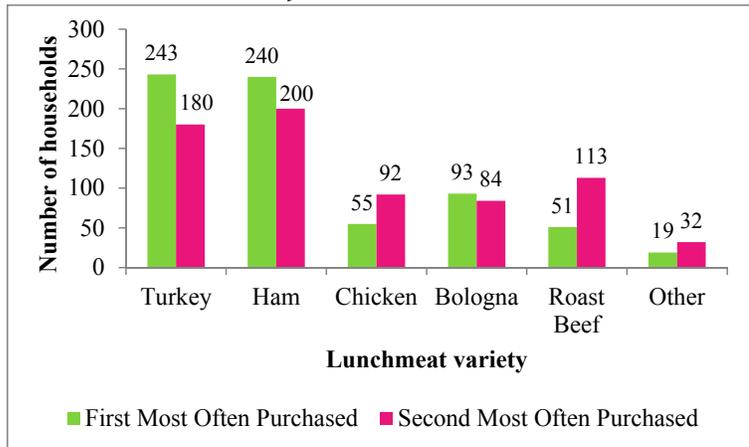
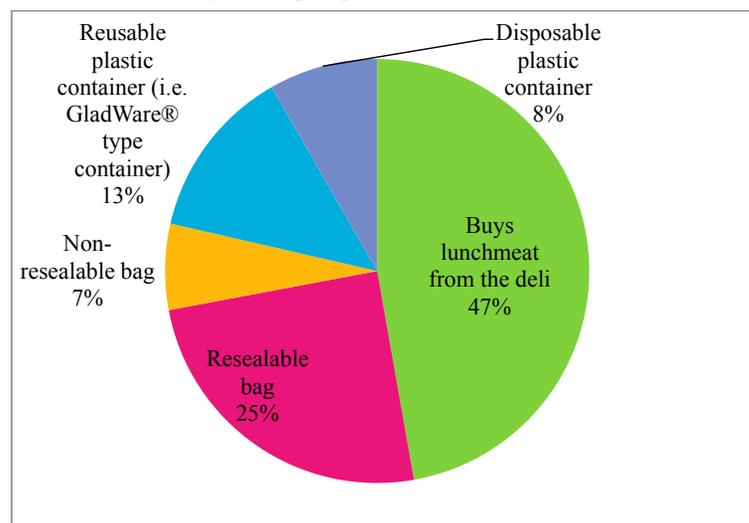


Figure 3. Deli and prepackaged lunchmeat packaging purchases (n=701)



⁶ Northeast included CT, ME, MA, NH, NJ, NY, PA, RI, and VT. Midwest included IL, IN, IA, KS, MI, MO, NE, ND, OH, SD, and WI. South included AL, AR, DE, DC, FL, GA, KY, LA, MD, MS, NC, OK, SC, TN, TX, VA, and WV. West included AK, AR, CA, CO, HI, ID, MT, NE, NM, OR, UT, WA, and WY.

that “produced on farms with animal welfare and handling standards in place,” “produced by farmers certified in animal welfare techniques,” “hormone free,” and “antibiotic free” were associated with higher-quality lunchmeats. The attribute that the fewest participants associated with higher-quality lunchmeat was “kosher,” with 430 (54 percent) participants agreeing.

When the 701 participants who classified themselves as lunchmeat purchasers were asked which of these lunchmeat attributes they actually considered during purchase, the responses were somewhat different (Figure 4). “All natural” was still the attribute leader with 425 (61 percent) participants considering it during

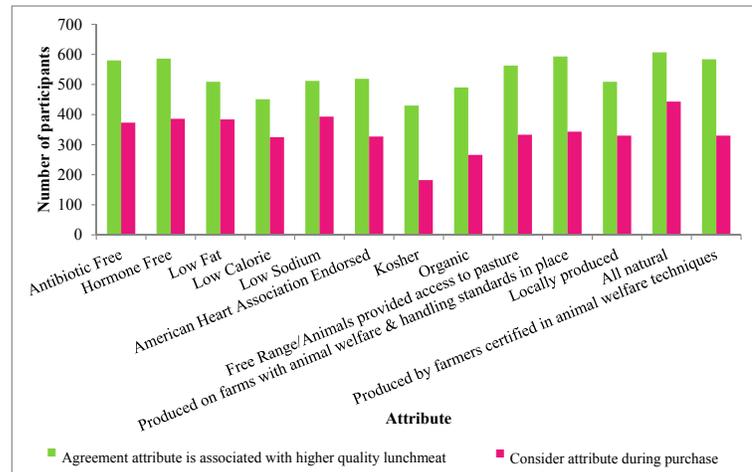
lunchmeat purchases. However, “produced on farms with animal welfare and handling standards in place” and “produced by farmers certified in animal welfare techniques” were not as commonly considered, only 329 (47 percent) and 317 (45 percent) participants considered these attributes during purchase, respectively. Therefore, even though consumers may associate an attribute with high quality, not all consumers will actually purchase lunchmeat with that attribute.

The results in Figure 4 show an obvious paradox. The divergence between what is perceived to be higher quality and what is actually purchased could be related to a number of issues. Potentially, these differences are due to the attributes being more expensive than the shopper’s willingness to pay for them. Additionally, although consumers may associate an attribute with high quality, they may not actually purchase or feel it is necessary to purchase what they believe is the highest quality. Conceivably, consumers do not associate lunchmeat with a high-quality product, and therefore do not purchase lunchmeat with additional attributes. Since lunchtime is generally a rushed or brown bag meal, if someone wants a higher quality meal, then they may decide to eat at a restaurant or consider alternatives to lunchmeat.

The idea of differences in consumer perceptions and purchasing behavior is not a new one. Norwood (2011) states, “I am always asked why people demonstrate strong support for animal-friendly food in the voting booth, but not the grocery store.” Tonsor, Wolf and Olynk (2009) found that 69 percent of participants support a ban on gestation crates in a typical ballot setting, however, once participants were informed that the ban would increase their income taxes, support fell to 31 percent. Therefore, consumers may be fond of the idea of buying higher-quality lunchmeat attributes, but when it comes to the actual purchase, money is a priority.

Producers, lunchmeat processors, retailers and supply chain members can utilize this information when considering whether or not new attributes can be profitably included in their product offerings. When testing the acceptance of a product attribute, lunchmeat manufacturers could

Figure 4. Agreement that attribute is associated with higher quality lunchmeats (n=798) and consideration during lunchmeat purchases (n=701)



offer attributes in turkey and ham products first, since the largest number of consumers buy those products, before offering it in all lunchmeat varieties. Additional ways to increase lunchmeat demand could include marketing alternative uses of lunchmeat other than sandwiches, marketing lunchmeat to older and smaller families and increasing deli lunchmeat appeal in geographic regions other than the Northeast.

Smoked Ham Purchasing Characteristics

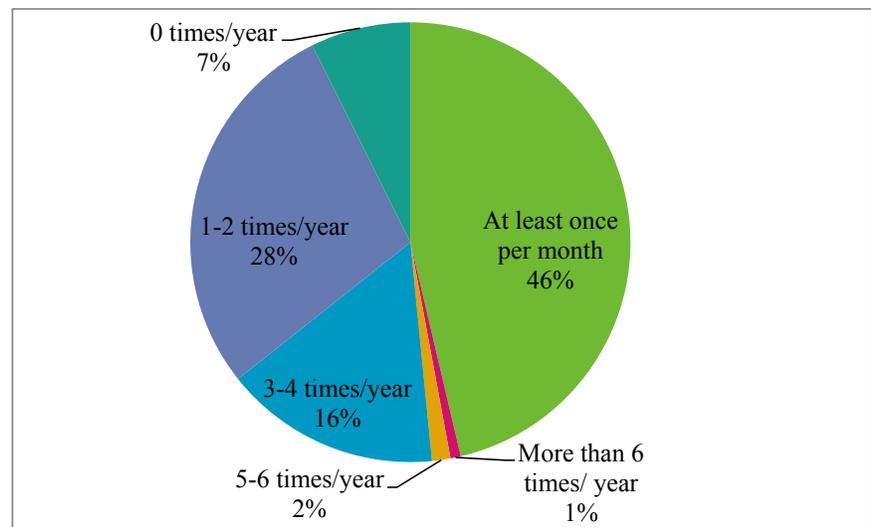
A total of 667 (84 percent) households in this study purchase smoked ham (Table 3). The most common smoked ham purchased was half a ham, followed by ham steak or ham cubes, then spiral bone-in ham. Since smoked ham is generally advertised as a holiday or special occasion meat, it is surprising that 46 percent of households purchase smoked ham at least monthly (Figure 5). When asked when they primarily consumed smoked ham, 44 percent reported major holidays, 41 percent regular meals and 15 percent at gatherings other than major holidays. The majority of the 41 percent of participants that primarily consume ham at regular meals are those that purchase ham at least once a month⁷. Of the 44 percent that primarily consume smoked ham at major holidays and 15 percent at gatherings other than major holidays, the majority purchase ham zero to four times per year. When asked what percentage of smoked ham purchased was consumed in the provided ways, participants indicated that 74 percent was consumed as a main course, 11 percent consumed in a casserole, 11 percent used as an ingredient, and four percent was used in other ways not listed. Given that a substantial amount of ham is consumed at regular meals, there is potential to market smoked ham more heavily as an everyday meal staple as opposed to a holiday or special occasion dish.

Table 3. Types of smoked ham products purchased (n=798)^a

Ham Product	Number of households	Percent of households
Half a ham	286	36%
Whole ham	156	20%
Spiral- bone in ham	221	28%
Bone in ham	140	18%
Ham steak or ham cubes	241	30%
Frozen ham	47	6%
My household does not consume ham	131	16%
Other	34	4%

^a Participants could select all that apply, unless “none” was selected.

Figure 5. Frequency of smoked ham purchases (n=667)



⁷ Cross tabulation results for all analyses cited are available in Appendix 1.

Familiarity with and Perceptions of Livestock Welfare

It is hypothesized that respondents' familiarity with agriculture, especially livestock rearing, may impact their perceptions of various livestock production practices. Additionally, Velde, Aarts and Woerkum (2002) state that people create their perceptions from their frame of reference, which is influenced by their convictions, values, norms, knowledge and interests. Therefore, it is necessary to collect information from participants with regards to their experience or values related to animal agriculture to better understand their frame of reference. As a gauge of familiarity with livestock production, participants were asked when they last visited a farm with animals being raised for milk, meat or egg production. Only 31 percent had visited such a farm within the last five years, 7 percent 6 to 10 years ago, 31 percent more than 10 years ago and 31 percent have never visited such a farm. Therefore, 69 percent have not visited a farm in the last five years, leading to questions surrounding whether they have been exposed to the latest technology and rearing techniques.

When asked about their level of concern regarding the welfare of livestock animals employed in food production domestically, with one indicating not concerned and seven extremely concerned, the mean level of concern was 4.26. When asked about concern for livestock animals employed in food production outside the U.S., the mean level of concern was 5.35. Therefore, U.S. consumers are less concerned about animal welfare in the U.S. than in other countries, but still indicated some concern for welfare of U.S. food animals. This could indicate that participants felt that better animal welfare standards are in place in the U.S. than outside the U.S. or a true difference in level of concern for the welfare of animals raised domestically versus abroad. The implications of differences in consumer perceptions of animal welfare domestically versus internationally should be considered moving forward, as perceptions of livestock raised domestically versus outside the U.S. can have large implications for where products will be produced and traded in the future.

Whether respondents were familiar with livestock rearing or not, it is hard to escape the media stories that have surfaced regarding livestock animal welfare in recent years. The pork industry has been at the epicenter of many animal welfare debates (Norwood, 2011; Tonsor, Wolf and Olynk, 2009). Therefore, it is important to understand how consumers view the pork industry and their concerns about animal welfare. In this study, 14 percent of participants indicated that they have reduced their overall pork consumption in the past three years due to animal welfare/handling concerns, with an average reduction of 56 percent from their previous amount consumed. This is a much greater reduction than results from past studies with dairy products; McKendree, Olynk, and Ortega (2012) found that "7 percent of consumers indicated they had reduced their ice cream consumption, while 7 percent reduced butter consumption, 6 percent reduced yogurt consumption, 6 percent reduced cheese consumption and 5 percent reduced fluid milk consumption" due to animal welfare concerns in the previous three years. Consequently, further research may be needed to investigate this decrease in demand for pork products due to animal welfare concerns. One potential explanation for the difference in reported reductions in pork versus milk products is the fact that pork is a meat product for which an animal must be slaughtered, whereas dairy products do not require slaughter of the dairy cow. There is potential that the actual act or need for slaughtering the animal alters welfare-related impacts on demand. More research is need to uncover the specific apprehensions that people have when eating and/or purchasing pork products.

Participants were asked to rank pork animal industry segments and production stage in order of animal welfare concern, with one being the highest level of concern and four being the lowest level of concern. Table 4 shows the production stages in question, in order from most concerned about

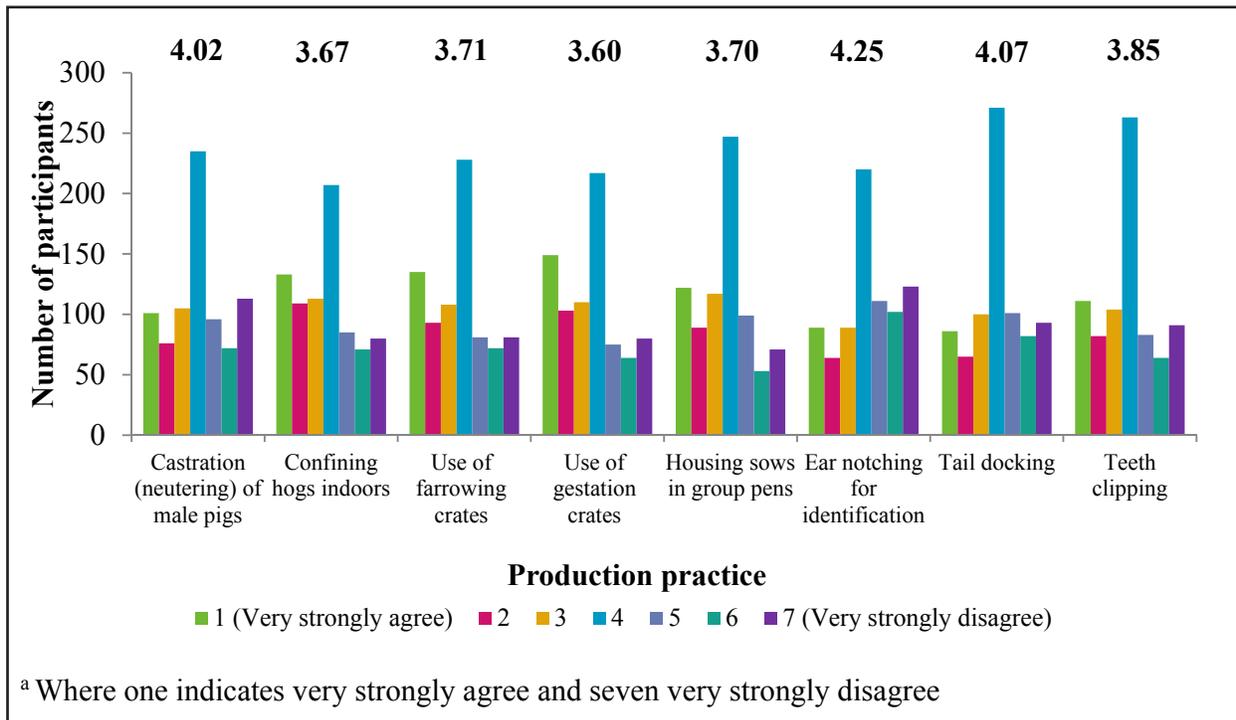
Table 4. Level of concern for animal welfare/handling of pigs in industry segments and production stages (n=798)^a

Animal industry segment or production stages	Mean level of concern
Processors / Locations of animal slaughter and meat processing	1.9
Farmer / On-the-farm production	2.6
Transportation / Hauling and moving of animals between farms or to points of sale	2.7
Auction Markets / Locations where animals change ownership	2.9

^a Where one indicates the highest level of concern and four the lowest level of concern

animal welfare to least concerned. Processors (locations of animal slaughter and meat processing) generated the most concern by far with a mean of 1.9 and auction markets (locations where animals change ownership) were ranked the lowest with a mean of 2.9. These rankings could be influenced by media coverage, including negative depictions of meat processors and slaughter houses such as in the Meatrix[®] video (Fox, 2003). It is foreseeable that survey respondents know the least about auction markets and thus auction markets generated the least concern. It was also found by Velde, Aarts and Woerkum (2002) that consumers did not blame farmers for what they thought were bad living conditions for the animals; instead they viewed farmers as “victims of the system.” Furthermore, Frewer et al. (2005) found that farmers were the most trusted and were perceived to be the most knowledgeable regarding animal welfare.

Figure 6. Agreement that practice reduces the welfare of pigs (n=798)^a



Participants were also asked about specific pork production practices and if they agreed that the practice reduced the welfare of the pig. Figure 6 shows the distribution of responses, as well as the mean level of concern in bold. Overall, it is clear that most individuals had a neutral attitude about each practice. This neutrality could indicate that the participant was unfamiliar with the production practice or that they really are neutral regarding the practice. Participants felt that housing types reduced pig welfare; housing sows in group pens⁸, use of farrowing crates⁹, use of gestation crates¹⁰ and confining hogs indoors had the lowest means, indicating the participants felt these practices reduced pig welfare the most. This could be due to the fact that most media surrounding pig welfare has focused on housing situations (Norwood, 2011; Tonsor, Wolf and Olynk, 2009). Ear notching, castration and tail docking had the highest means of those practices shown to respondents. Potentially, respondents may have not associated these practices with lowering pig welfare because they are most familiar with these practices, as they are common for household pets. Additionally, respondents could also assume that pigs, like pets, are given analgesia or anesthesia during ear notching, castration and tail docking.

Figure 7a. Concern for animal welfare, concern for food safety and purchase in last six months of select products (n=798)

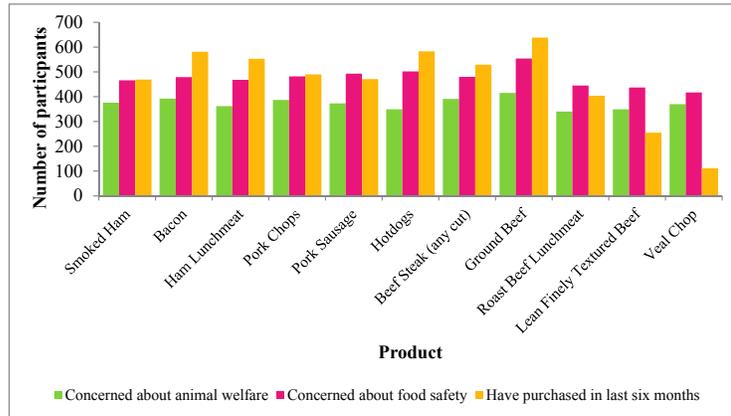
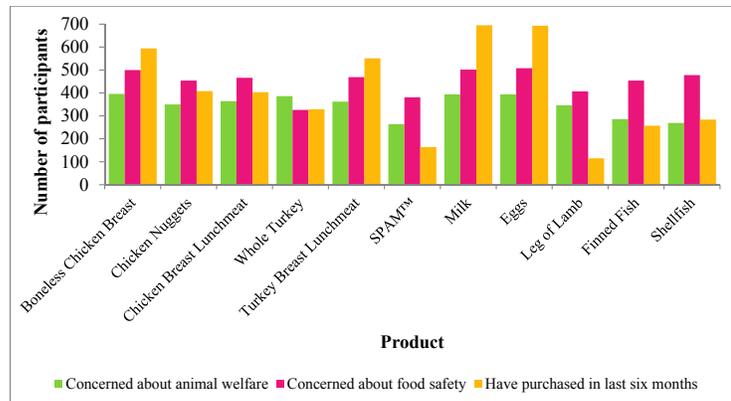


Figure 7b. Concern for animal welfare, concern for food safety and purchase in last six months of select products (n=798)



It has been hypothesized that consumers have differing animal welfare and food safety concerns across products, species and levels of processing. Figures 7a and 7b show results when consumers were asked whether they were concerned about food safety and animal welfare in various products, as well as if they have purchased the product in the last six months. For every product in question, except for whole turkey, participants were more concerned about food safety than animal welfare. The greatest number of respondents were concerned about animal welfare in ground beef, 415 (52 percent); boneless chicken breast, 396 (50 percent); milk, 394 (49 percent); eggs, 394 (49 percent); and bacon, 392 (49 percent). The fewest participants, 264 (33 percent)

⁸ Participants were given this definition: A pen in which a group of sows is placed during the animal's four-month pregnancy until the time of farrowing (giving birth to piglets).
⁹ Participants were given this definition: A crate or cage in which a sow is individually confined at time of farrowing (giving birth to piglets).
¹⁰ Participants were given this definition: A crate or cage in which a sow is individually confined during the animal's four-month pregnancy until the time of farrowing (giving birth to piglets).

and 269 (34 percent), were concerned about animal welfare in SPAM™ and shellfish, respectively. Similarly, the most concern for food safety was generated by ground beef with 69 percent of participants indicating concern, followed by eggs (64 percent), milk (63 percent), hotdogs (63 percent) and boneless chicken breast (63 percent). The least concern for food safety was stimulated by whole turkey (41 percent) and SPAM™ (48 percent). These results indicate that consumers could have differing views about food safety and animal welfare across products, even when the products are from the same species. Take animal welfare concern for beef products as an example; 52 percent of participants were concerned about ground beef, 49 percent about beef steak and 43 percent about roast beef lunchmeat. It would have been conceivable that consumers have the same concern for beef products since they all come from cattle; however, this does not appear to be the case. These differences raise questions about consumer preferences surrounding different products and their linking of products to animal species.

It has been hypothesized that consumers associate or tie animal welfare and food safety together. The livestock products that the greatest number of respondents reported purchasing in the last six months were milk (87 percent), eggs (87 percent) and ground beef (80 percent). Although it may seem contradictory that the products consumers were most concerned about were purchased by the most respondents, it seems sensible that they would be most concerned about the products that they consider staples in their diet (i.e., milk and eggs). Further, participants could be demonstrating ambivalence as discussed by Velde, Aarts and Woerkum (2002). Velde, Aarts, and Woerkum (2002) observed that although consumers may feel guilty about the way the farm animals are treated, they use coping strategies to justify their meat purchases; “In other words, their buying behavior does not simply reflect their attitude towards the way animals in intensive farming are treated.” Additionally, consumers may be expressing concern for those products that have been highlighted in media coverage and the popular press. Many staple products, such as milk and eggs, have received a great deal of negative media attention in recent years, potentially impacting consumers’ views of those products — even if they are commonly purchased and consumed.

Consumers were asked if they agreed or disagreed with the statement, “I believe it is less humane to slaughter a baby animal than an adult animal of the same species,” 43 percent of participants agreed. Veal has had a great deal of controversy regarding welfare practices in the past. However, in this study, the number of consumers indicating concern for animal welfare in the production of veal was less than the number indicating concern for animal welfare in the production of smoked ham, bacon, pork chops, pork sausage, steak, ground beef, chicken breast, whole turkey, milk and eggs (Figures 7a and 7b). While a great deal of focus has been placed upon veal production in the past, it is apparent that other products are generating concern from equal or larger numbers of consumers. It is hypothesized that media stories and continued public discussion surrounding the welfare associated with pigs, dairy cattle and egg production may keep these issues in the forefront of consumers’ minds, compared to veal.

Conclusions and Implications

Consumers are increasingly reporting concern regarding how their food is produced, from a functional standpoint regarding food safety and quality concerns, and through preferences regarding production process attributes, such as welfare-friendly production techniques. While a great deal of attention is placed on special interest groups and “why” consumers care about

livestock rearing, livestock production must respond to changing consumer demands, whether driven by emotions, perceived ethical obligations or food science. The pork industry has been an area of focus in recent years, both in legislative and market channels, prompting this in-depth analysis of consumer purchasing behaviors and perceptions via an online survey of 798 U.S. consumers.

Eighty-eight percent of those sampled indicated they purchased lunchmeat, while 84 percent indicated they purchased smoked ham for their household. Those households purchasing lunchmeat were statistically younger and larger than those not purchasing. Additionally, those in the Northeast more frequently reported purchasing lunchmeat from delis, rather than prepackaged lunchmeat options, highlighting the geographical variation in purchasing patterns. Such differences should be acknowledged by marketers as convenience factors, packaging preferences and expenditures vary across consumers. When asked about lunchmeat attributes, inconsistencies were found between which attributes participants considered to be associated with higher-quality lunchmeats and which attributes were actually considered during lunchmeat purchases. Various attributes were highlighted by consumers as indicating quality, such as having animal welfare standards in place in production; however, many consumers did not report considering these high-quality attributes during purchase, potentially exposing a difference between their stated preferences and demand for lunchmeat attributes. Differences between consumers' views of what makes lunchmeat high quality and what they actually buy are key for suppliers to recognize. Perhaps certain consumers are knowingly trading certain attributes, even if they consider them quality enhancing, for lower prices. Or, perhaps consumers are trading attributes in lunchmeat with other food purchases, such as seeking different production process attributes for ground beef or ham versus lunchmeat, for example. Consumers in some markets may not have all of the investigated attributes available to them for purchase in lunchmeat. Beyond lunchmeats, marketers and pork producers alike might seek to re-evaluate how ham is positioned in the marketplace. Consumption occasion, or the common setting in which a food item is served or consumed, may be impacting responses for both lunchmeat and ham products. Lunchmeat is commonly consumed at lunch and on a sandwich. Ham is often perceived as a holiday or special occasion meat, but 41 percent of ham-purchasing households indicated that they consumed ham at regular meals. Recognition of when, where and why consumers purchase certain products will aid marketers, retailers and supply chain members in developing products that meet their consumers' demands.

Fourteen percent of respondents indicated that they had reduced their pork consumption in the past three years due to animal welfare concerns. The reduction in consumption of pork products exceeds past findings on reductions of dairy products due to animal welfare concerns (McKendree, Olynk, and Ortega, 2012) potentially indicating differences in views of pork and dairy products. Animal welfare and food safety concerns differed across animal species, as well as the individual product in question, even if it is produced by the same species. Understanding consumer perceptions of livestock products and livestock product shopping characteristics will aid agricultural industry leaders and policy makers in effective communication with consumers and stakeholders regarding new regulations and legislation surrounding livestock animal welfare.

Future research could include investigation into other meat and dairy products; consumer sentiment varies across animal species and across products from the same animal species.

Further, more in-depth discussion with consumers, via the use of focus groups or face-to-face interviews, would allow greater understanding of the thought processes used to discern differences across products. Beyond establishing understanding of consumer demand for products produced using specific processes, other questions for further work could include addressing “Whose attitudes and concerns get reflected in policy or market forces used to influence farm animal welfare?” and “Who determines which products enter into the market?”. Answering these questions would involve addressing supply chain relationships and possible conflicts of interest between parties in the supply chain.

Appendix 1

Question, as stated in survey instrument		Lunchmeat consuming households	Non lunchmeat consuming households
		A N=701	B N=97
I am _____ years old.	Average age of survey respondent in years	45.83 **	51.73 ¹
Please fill-in each blank with a whole number representing the number of adults and children within each age bracket living in your household. If no children in a given age bracket are living in your household, please enter 0. Include yourself in the count.	Adults (over 18 years)	1.97 **	1.69
	Children under 3 years	0.11 **	0.04
	Children ages 4 to 6	0.07	0.04
	Children ages 7 to 9	0.09 **	0.02
	Children ages 10 to 12	0.09	0.05
	Children ages 13 to 15	0.10	0.06
	Children ages 16 to 18	0.08 **	0.01
How much would you estimate your household spends each week on total food consumption including at home, in restaurants, take-outs, etc.?	Average weekly food expenditure in \$	137.98 **	95.10

1. A single asterisk (*) indicates a 90% confidence level that the two groups presented (Group A and Group B) are different from one another. Two asterisks (**) indicate a 95% confidence level that the two groups presented (Group A and Group B) are different from one another.

Question, as stated in survey instrument		Lunchmeat consumption over 1.1 lbs per week A N=148	Lunchmeat consumption under 1.1 lbs per week B N=553
I am _____ years old	Average age of survey respondent in years	42.04**	46.84
Please fill-in each blank with a whole number representing the number of adults and children within each age bracket living in your household. If no children in a given age bracket are living in your household, please enter 0. Include yourself in the count.	Adults (over 18 years)	2.33 **	1.87
	children under 3 years	0.15	0.10
	children ages 4 to 6	0.14 **	0.06
	children ages 7 to 9	0.13 *	0.07
	children ages 10 to 12	0.16 **	0.07
	children ages 13 to 15	0.20 **	0.07
	children ages 16 to 18	0.16 **	0.06

Question, as stated in survey instrument	Answer	Holiday/Gathering Ham Eaters A N=392	Regular Meal Ham Eaters B N=275
Does your household purchase smoked ham (excluding ham lunchmeat) at least once per typical month?	Yes	29% ** 113	71% 196
	No	71% ** 279	29% 79
		N=279	N=79
If “No” to above question then: How many times per year does your family purchase smoked ham (excluding ham lunchmeat)?	0	15% 42	9% 7
	1-2	56% ** 156	42% 33
	3-4	26% ** 73	42% 33
	5-6	2% 6	4% 3
	More than 6	1% ** 2	4% 3

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