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Consumption Frequency and Perceptions of the Healthfulness of Selected Meat Products

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Abstract

Results from a sample of grade-level students suggest that they consumed tacos more frequently than frankfurters, hamburgers, nuggets, chicken, beef, or goat meat. The sampled students also perceived beef as more unhealthy than chicken or goat meat. Ninety-five percent of the students expressed some willingness to try new food products, and 80 percent indicated they would encourage their parents to buy goat meat products. Gender and grade levels did not affect eating frequencies of the selected meat products. However, more females perceived nuggets as unhealthy when compared to males. High-school students were also more likely to perceive nuggets as unhealthy when compared to students from elementary and middle schools.

Keywords: elementary, middle and high-school students, beef and chicken, goat meat, frankfurters, hamburgers, tacos, and nuggets

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Introduction

Recent data from the *Centers for Disease Control* and the *Prevention Behavioral Risk Factor Surveillance System* suggest that from 2012 through 2014 non-Hispanic Blacks had the highest prevalence of self-reported obesity (38.1%); followed by Hispanics (31.3%); and non-Hispanic whites (27.1%). The highest prevalence of obesity was in the South (39.5%) and the Midwest (38.8%), followed by the West (34.6%), and the Northeast (34.2%). The data also indicated that Louisiana's adult obesity rate was 33.1% and that more than one-third of adults and 17% of youth in the United States were obese (Odgen et al. 2014). Additionally, about 12.7 million children and adolescents aged 2–19 years in the United States are obese, with the prevalence highest among Hispanics and non-Hispanic Blacks (CDC 2011).

Overweight and obesity during childhood can have deleterious effects on the body. For example, research suggests that obese children have a greater risk of developing high blood pressure and high cholesterol (Freedman et al. 2007); type 2 diabetes, fatty liver disease, gallstones, and gastro-esophageal reflux (Whitlock et al. 2005); impaired social, physical, and emotional functioning and behavioral problems (Morrison et al. 2015); sleep apnea and asthma (Han et al. 2010. Children who are obese are also more likely to become obese adults with serious health maladies (Juonala et al. 2011; Freedman et al. 2009). These findings are disconcerting because medical costs for treating obesity-related illnesses now exceed $147 billion annually, and an obese person costs $1,429 more to treat than a normal-weight person (Flegal et al. 2010).

Meat consumption in the developed world including the United States has continued to increase with red meat and processed meat accounting for 58% and 22%, respectively, of overall consumption (Daniel et al. 2011). Meat contributes a high biological value protein, iron, zinc, selenium, vitamin B12, and crucial components of a well-balanced diet. However, because of its saturated fat and dietary cholesterol components, it is also linked to the risk for chronic diseases (Pereira and Vicente 2013). Other investigators have established relationships between the consumption of red and processed meat and risks for developing chronic diseases, such cardiovascular disease and type 2 diabetes (Micha et al. 2012), and some cancers (Chan et al. 2011).

Conflicting research findings on the relationships between consumption of red and processed meat and risks of chronic diseases drove Larsson and Orsini (2014) to conduct a meta-analysis of prior studies on red and processed meat consumption and mortality. They found that consumption of processed meat and total red meat had positive and statistically significant relationships with all-cause mortality, but there was no relationship with unprocessed red meat. The meta-analysis done by Chen and colleagues (2013) uncovered links between red meat and or processed meat and increased risks for ischemic stroke. Micha, Wallace, and Mozaffarian (2010) inferred that coronary heart disease and diabetes mellitus were associated with processed meat consumption, but not with red meat consumption. Wang and colleagues (2010) focused on the relationships between reduction in obesity, medical costs, and quality of life. They projected that under a best case scenario a one-percentage point reduction in overweight and obese 16 and 17-year-olds would reduce future obese adults by almost 53,000, medical costs by $586 million, and increase quality-adjusted life by about 47,000.

The demand for convenience meat products such as patties, sausages, nuggets, frankfurters, hamburgers, and hams has been increasing with the growing world population, ongoing urbanization, and busy lifestyles. However, consumption of convenience meat products made from beef and pork can contribute significantly to the daily requirement for fat, sodium, and overall calories. Nutritional analyses of products sold in fast-food restaurants indicate that they are typically high in energy density, providing a feasible mechanism for excess energy intake (Bowman et al. 2004).

According to the *USDA Nutrient Database for Standard Reference* (2011), a serving of chicken nuggets (approx. 100 grams) contains 19.82 g of fat, 43 mg of cholesterol, and 557 mg of sodium. Likewise, a 5-inch long beef frankfurter provides 13 g fat, 24 mg cholesterol, and 513 mg sodium, and a quarter pound hamburger contains 10 g fat, 63 mg cholesterol and 760 mg sodium. Based on the nutrition composition data, consumption of these products contributes significantly to the daily requirement for fat, sodium, and overall calories. The dietary reference intake states that the daily requirement, using that 2000 calorie/day diet plans, is 65 g of total fat, 300 mg of cholesterol and 2400 mg of sodium (US Department of Agriculture 2010).

Goat meat is a lean meat with favorable nutritional quality and attributes that conform to current demand for healthier meat. Reduction in childhood obesity, and an increase in the market share of goat meat in the meat industry may be achieved through the introduction of more convenient, healthier, and traditional product forms to the public. Thus, if Louisiana grade-level students who currently eat traditional meat products were to eat low-fat, healthier goat meat alternatives such as patties, nuggets, tacos, and frankfurters, then we may be able to lower childhood and adolescent obesity rates in the state.

Children and adolescents are powerful forces in shaping future demand and supply functions for goods and services. Therefore, their willingness to try new food products must be studied so that the meat industry can accurately anticipate future demand for traditional and nontraditional meat products and respond accordingly. Our study analyzes consumption, potential consumption, and health perceptions about selected meat products among a group of young consumers in Louisiana to ascertain the potential market for goat meat products.

Objectives

The study's objectives are to document consumption patterns and perceptions about selected meat products by a group of grade-level students. Specifically, we examine (1) eating frequency of convenience meat products such as frankfurters, hamburgers, tacos, and nuggets made from traditional meats; (2) perceptions of the healthfulness of traditional meats and convenience meat products; (3) willingness to try new products, including goat meat products; and (4) whether gender and grade levels affect eating frequency, and perceptions of selected meat products.

Data and Procedures

The study's data were compiled from a survey of 60 grade-level students aged 10–18 years who participated in two summer programs on our campus. Data were compiled on consumption frequency; perceived healthfulness of traditional meat products such as nuggets, hamburgers,

hams and frankfurters; perceptions about goat meat consumption; knowledge of the nutritive value of goat meat, chicken and beef; willingness to purchase goat meat products; and on participants' age, grade levels, and gender. Specific questions were as follows. How often do you eat chicken, beef, goat, frankfurters, tacos, hamburgers, or nuggets? Do you consider franks, tacos, hamburgers, or nuggets to be healthy? Are you willing to try new foods? Would you ask your parents to purchase goat products if offered in the market? Chi-square tests for independence were used to analyze associations between gender or grade levels, and selected response categories.

Empirical Results and Discussion

Descriptive Statistics

Female students comprised 63% of the survey. The composition of the grade levels was as follows: elementary-school students (17%); middle-school students (33%); high-school students (50%). From table 1, the highest consumption level reported was 2-4 times/month and the eating frequencies were as follows: tacos (47%); nuggets (45%); hamburgers (43%); frankfurters (40%); beef (40%); chicken (37%); goat (7%). Participants opined that chicken was healthier (53%) than beef (23%) or goat (23%), but ranked beef as the least healthy (63%). Table 2's results indicate that a majority of the students perceived the selected convenience meats as unhealthy—hamburgers (80%); frankfurters (75%); nuggets (68%); tacos (53%). Overall, participants (95%) were receptive to trying new food products; 80% would ask parents to buy goat products.

Table 1. Eating Frequency of Selected Meat and Meat Products (%).

Meats	>1-2 times/week	2-4 times/month	3-4 time/year	seldom
Frankfurters	18.3	40.0	11.7	30.0
Hamburgers	38.3	43.3	11.7	6.7
Tacos	20.0	46.7	23.3	10.0
Nuggets	30.0	45.0	20.0	5.0
Chicken	31.7	36.7	26.7	5.0
Beef	40.0	40.0	8.3	11.7
Goat	5.0	6.7	10.0	78.3

Table 2. Perceptions of the Healthfulness and Willingness to Try New Food Products (%).

Meats	Yes	No
Frankfurters	25.0	75.0
Hamburgers	20.0	80.0
Tacos	46.7	53.3
Nuggets	31.7	68.3
Willing to try new foods	95.0	5.0
Asks parents to buy goat products	80.0	20.0

Chi-Square Results

Table 3 shows the cross-tabulations among grade levels, eating frequency, and students' perceptions of the healthfulness of frankfurters, hamburgers, tacos, nuggets, and goat meat. The results suggest that consumption frequencies are independent of gender. More females than males perceive nuggets as unhealthy. However, there are no other differences in how students' perceive the healthfulness of the other convenience meat products. High-school students are more likely to perceive nuggets as less healthy than other meat products than elementary and middle-school students (see Appendix).

Table 3. Associations among Gender, Eating Frequency, and Health Perceptions.

Meats	Male	Female	x^2	P-value	Male	Female	x^2	P-value
	Eating Frequency				Health Perceptions			
Frankfurters								
Frequently	27.3	61.2	0.512	0.474	53.3	46.7	2.392	0.122
Seldom	38.8	72.7			31.1	68.9		
Hamburgers								
Frequently	39.1	60.0	0.097	0.755	25.0	75.0	0.879	0.348
Seldom	35.1	64.9			39.6	60.4		
Tacos								
Frequently	50.0	50.0	1.148	0.284	32.1	67.9	0.463	0.496
Seldom	33.3	66.7			40.6	59.4		
Nuggets								
Frequently	33.3	66.7	0.123	0.726	52.6	47.4	3.052*	0.081
Seldom	38.1	61.9			29.3	70.7		
Goat Meat								
Frequency	33.3	66.7	0.015	0.902				
Seldom	36.8	63.2						

Note. (*) implies statistical significance at the 10 percent level of probability.

Summary and Conclusions

Research from the Centers for Disease Control and Prevention (CDC) suggests that good nutrition is a precursor for proper growth and development of children and adolescents. Further, healthy eating in childhood and adolescence can reduce the likelihood of developing diseases such as high cholesterol, high blood pressure, cardiovascular disease, cancer, obesity, osteoporosis, iron deficiency, and diabetes later in life. Fast-food laden diets increase the likelihood of becoming overweight or obese and the risk for developing lung, esophageal, stomach, colorectal, and prostate cancers (CDC 2015). To complicate matters, a large majority of America's youth do not commune the recommended intake for meat, fruits and vegetables, or

whole grains each day. However, their daily consumption levels of sodium far outweigh the recommended daily intake of between 1,500 to 2,300 milligrams. Further, caloric intake of added sugars and fats have been steadily increasing among children and adolescents because of their increased consumption of soda, fruit drinks, dairy desserts, grain desserts, pizza, and whole milk (CDC 2015).

Unhealthy weight gain due to poor diet and lack of exercise is responsible for over 300,000 deaths each year. Foods from animal sources remain major contributors of total fat, saturated fat, and cholesterol in the American diet. Goat meat is gaining acceptance because of its low saturated fatty acid and cholesterol levels when compared to similar cuts in beef and chicken. If goat meat were adopted and used meat in school menus, this could lower grade-level students' daily intake of total fat, saturated fat, and cholesterol.

Children and adolescents will shape future demand and supply functions for goods and services. Therefore, their willingness to try new food products must be studied so that the meat industry can accurately anticipate future demand for traditional and nontraditional meat products and respond accordingly. Consequently, our study's objectives were to document consumption patterns and perceptions about selected meat products by a group of grade-level students. Specifically, we examined (1) eating frequency of convenience meat products such as frankfurters, hamburgers, tacos, and nuggets made from traditional meats; (2) perceptions of the healthfulness of traditional meats and convenience meat products; (3) willingness to try new products, including goat meat products; and (4) whether gender and grade levels affected eating frequency, and perceptions of selected meat products.

The results suggested that eating frequencies were invariant of gender and grade levels. Female students were more likely than males to perceive nuggets as unhealthy, while high-school students were more likely to perceive nuggets as unhealthy. Given these findings, female and high-school students could become potential consumers of goat-meat nuggets in the foreseeable future. Unfortunately, given our small sample, we cannot say definitively that the market for goat meat and goat meat products will be economically viable in the future. However, given goat meat desirable nutritional attributes; rising medical costs for treating diet-related illnesses; and budgetary challenges at the national and state levels, we must all become more proactive in improving our eating habits.

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Appendix

Associations among Grade Levels, Eating Frequency, and Health Perceptions.

Meats	Elem.	Middle	High	x^2	P-value	Elem.	Middle	High	x^2	P-value
	Eating Frequency					Health Perceptions				
Frankfurters										
Frequently	18.2	18.2	63.6	1.447	0.485	13.3	53.3	33.3	3.644	0.162
Seldom	16.3	36.7	46.9			17.8	26.7	55.6		
Hamburgers										
Frequently	21.7	26.1	52.2	1.199	0.549	8.3	41.7	50.0	0.938	0.626
Seldom	13.5	37.8	48.6			18.8	31.2	50.0		
Tacos										
Frequently	16.7	33.3	50.0	0.000	1.000	21.4	35.7	42.9	1.339	0.512
Seldom	16.7	33.3	50.0			12.5	31.2	56.2		
Nuggets										
>1-2 times/wk	5.6	44.4	50.0	2.857	0.240	36.8	21.1	42.1	9.395**	0.015
Seldom	21.4	28.6	50.0			7.3	39.0	53.7		
Goat Meat										
Frequency	0.0	66.7	33.3	1.754	0.416					
Seldom	17.5	31.6	50.9							

Note. (*) Implies statistical significance at the 10^{th} level of probability.