Journal of Applied Communications

Volume 110 | Issue 3 Article 3

Pork Knowledge Gap Among the U.S. Consumers: The Role of Socioeconomic Status and Perception

Mamata Adhikari
Iowa State University

Tafadzwa Anne-Marie Dzinoreva
Iowa State University

Shuyang Qu
Iowa State University

Follow this and additional works at: https://journals.newprairiepress.org/jac/

This work is licensed under a Creative Commons Attribution-Noncommercial-Share Alike 4.0 License.

Recommended Citation
Adhikari, M., Dzinoreva, T. A-M., Qu, S., Lamm, A., Byrd, A. R., Lamm, K. W., Masambuka-Kanchewa, F., Sanders, C. E., & Retallick, M. (2026). Pork knowledge gap among the U.S. consumers: The role of socioeconomic status and perception. *Journal of Applied Communications, 110*(3), 1–26. https://doi.org/10.4148/jac.20855

This research is brought to you for free and open access by New Prairie Press. It has been accepted for inclusion in the *Journal of Applied Communications* by an authorized administrator of New Prairie Press.

Pork Knowledge Gap Among the U.S. Consumers: The Role of Socioeconomic Status and Perception

Abstract

This study examined pork knowledge gaps among U.S. consumers assessing whether socioeconomic status (SES) or meat perceptions explain differences in factual understanding. The objectives were to (1) identify consumers' knowledge level about pork, (2) determine how income and educational levels influence pork knowledge and (3) examine how positive and negative perceptions toward meat influence consumer knowledge about pork. An online survey of 1,011 U.S. adults was conducted in July 2024. Respondents evaluated seven true statements on pork production and rated eleven positive and five negative items from the Meat Attachment Questionnaire. One-way ANOVAs tested differences by SES and Pearson's correlations examined associations between perceptions and knowledge. One-way ANOVAs revealed no significant differences by income and education, contradicting the traditional knowledge gap hypothesis. Instead, knowledge scores correlated weakly and positively with positive meat perceptions (r = .25, p < .01) and weakly but negatively with negative perceptions (r = .19, p < .01). These results indicate a perception-driven knowledge gap where confirmation bias and motivated reasoning could have governed information acquisition about pork. Therefore, strategies to bridge the knowledge gap should align pork messaging with consumer values and use storytelling to communicate information about pork. Future research should examine how perception-based gaps relate to misinformation and test these patterns in pork-centric cultures beyond the U.S.

Keywords

Knowledge gap hypothesis, socioeconomic status (SES), consumer perception, pork

Authors

Mamata Adhikari, Tafadzwa Anne-Marie Dzinoreva, Shuyang Qu, Alexa Lamm, Allison R. Byrd, Kevan W. Lamm, Fally Masambuka-Kanchewa, Catherine E. Sanders, Michael Retallick

This research is available in the *Journal of Applied Communications*: https://newprairiepress.org/jac/

Introduction

Meat and meat products are vital protein sources in human diets, with pork being one of the most widely consumed meats globally (USDA Foreign Agricultural Service, 2023). Specifically, pork contributes significantly to essential nutrient intake, providing vitamin B12, selenium, thiamin, and niacin in addition to high-quality protein (Agarwal & Fulgoni, 2023; Pinchen et al., 2020). Its affordability and high nutritional value further reinforce its significance in both established and emerging economies (Drewnowski, 2024).

As global demand for pork grows, so too has public interest in its nutrition (Penkert et al., 2021), production (Vida & Szűcs, 2020), and environmental sustainability (Drewnowski, 2024). This growing consumer consciousness about food choices has prompted increased scrutiny of pork production systems, with consumers seeking alternatives that align with their personal values such as concern for animal welfare, reducing environmental impact, and feeding their families healthier food (Agarwal & Fulgoni, 2023; Kristiansen et al., 2021; Liu et al., 2023; Smith et al., 2025; Verbeke et al., 2010). Increased media coverage, advocacy campaigns, and food labeling practices have contributed to raising public awareness of these issues and bringing them to the forefront of consumer discourse (Booth et al., 2025; Zhou et al., 2025). These emerging concerns highlight the need for clear, accurate, and transparent communication about pork and pork production methods to bridge gaps between public perceptions and scientific knowledge.

In addition, misinformation about pork persists, further complicating efforts to provide accurate information about pork to consumers (Murray et al., 2017; Teixeira & Rodrigues, 2021). These misperceptions are often shaped by how pork production and sustainability issues are communicated online where concerns about antibiotic use, animal welfare, health risk and environmental impacts are frequently presented in simplified or misleading ways (Kashyap et al., 2024; Roesel et al., 2019; Verbeke & Liu, 2014). Although device access is now widespread, 90% of U.S. adults own a smartphone and many lower-income adults rely on mobile devices as their primary gateway to the internet (Gelles-Watnick, 2024), access alone does not ensure exposure to credible, science-based agricultural information. Instead, consumers often encounter simplified, emotive, or misleading content that shapes perceptions of pork production. These dynamics highlight the importance of strategic messaging, trusted communicators, and efforts to improve agricultural literacy. Negative perceptions not only shape consumer attitudes but also hinder evidence-based, informed decision-making about pork products (de Araújo et al., 2022). While the information deficit model suggests that simply increasing factual knowledge does not necessarily change public attitudes (Simis et al., 2016), this study adds to the discussion of this model by examining how consumer perceptions and socioeconomic status contribute to pork-related knowledge gaps.

Recent scholarly findings highlight the economic repercussions that can follow when knowledge gaps about pork intersect with misinformation. For the purposes of this study, misinformation refers to inaccurate or misleading pork-related information. For instance, in a study following a hypothetical outbreak of African swine fever (ASF) in the United States (where ASF currently does not exist), researchers projected a 31.35% overall drop in pork demand, split into a 32% reduction for unprocessed pork (e.g., chops, loin, ribs), and a 30%

reduction for processed pork (e.g., bacon, ham, sausage) (Kashyap et al., 2024). One key reason for this sizable decrease was that nearly three-quarters of surveyed consumers were either uninformed about ASF or incorrectly assumed it posed a food safety or human health risk, even though the disease was not transmitted through pork consumption. Such misinformation-driven declines in pork demand could potentially cost the U.S. economy $55.46 billion, with consumers bearing $24 billion and producers $35 billion of the impact (Kashyap et al., 2024).

Socioeconomic status (SES) and consumer perceptions have been shown to significantly influence food-related knowledge and attitudes (Ajetunmobi & Laobangdisa, 2024; Wardle et al., 2000). However, most pork-focused knowledge-gap research has been narrow in scope. For example, Tønnesen and Grunert (2021) investigated psychological determinants such as attitudes, social norms, established habits, and ethical concerns. They found that attitudes and established habits were the most significant predictors of pork consumption intentions among pork consumers, while social norms and perceived behavioral control had less influence. While Bradford et al. (2022) explored consumer perceptions and knowledge gaps related to antimicrobial resistance (AMR) and antibiotic-free labeling in pork production, where they found that although many consumers were willing to pay more for such products, confusion about labeling and limited understanding of AMR remained significant.

Despite these contributions, the influence of socioeconomic factors, particularly education and income, on consumer knowledge about pork remains underexplored in the literature. In addition, the role of meat-related perceptions in shaping pork knowledge has received limited scholarly attention. This study addresses these gaps by examining how SES influences consumer knowledge about pork and how perceptions may intersect with or reinforce those knowledge patterns. Findings of this study will assist the development of targeted communication and policy strategies that reduce knowledge gaps and promote informed decision-making among diverse consumer groups (Bradford et al., 2022; Steede et al., 2020).

Theoretical Framework and Literature Review

Knowledge Gap Hypothesis

This study is guided by the knowledge gap hypothesis. Tichenor, Donohue, and Olien (1970) first proposed the knowledge gap hypothesis that suggested that when new information circulates through the media, individuals with higher SES acquire knowledge faster than those with lower SES, resulting in differences in understanding. These disparities occur because individuals in the higher SES groups benefit from greater access to resources, advanced education, and diverse media exposure. These advantages enable them to assimilate complex information more effectively (Gaziano, 1997; Hwang & Jeong, 2009; Lind & Boomgaarden, 2019). The hypothesis rests on two main propositions: (1) SES is positively associated with knowledge levels, and (2) as more information becomes available, the gap in knowledge widens between those with lower and higher levels of SES (Lind & Boomgaarden, 2019).

SES encompasses education, income, and occupation (Barakat & Konstantinidis, 2023; Fretz et al., 2016; Glymour et al., 2014; Pampel et al., 2012; Winkleby et al., 1992) and is influenced by various social and political forces that drive disparities and can reinforce persistent knowledge gaps (Gaziano, 1997; Lind & Boomgaarden, 2019). Among these factors, education

often emerges as the most consistent predictor of knowledge acquisition (Gaziano, 1997; Hwang & Jeong, 2009; Kim & Chen, 2023; Lind & Boomgaarden, 2019; Viswanath et al., 1993). According to Gaziano (1997), knowledge gaps refer to "the differences in the amount of information that individuals acquire and retain during the learning process" (p. 238). Empirical evidence from studies on public affairs, science, and health further supports the existence of these gaps (Bao & Lee, 2023; Lind & Boomgaarden, 2019; Viswanath et al., 1991).

Much of the earlier research on knowledge gaps had been conducted in the field of politics. For instance, in political communication, higher-educated audiences tend to acquire and retain information about electoral candidates and public policies more effectively than lower-educated segments (Lind & Boomgaarden, 2019; Moore 1987). In the health context, individuals with advanced educational backgrounds demonstrate higher awareness and compliance with public health guidelines related to dietary recommendations, cardiovascular disease, and HIV/AIDS transmission (Barakat & Konstantinidis, 2023; Lind & Boomgaarden, 2019; Salmon et al., 1996; Viswanath et al., 1993; Viswanath et al., 1991). Although food and agriculture communication parallels health and science communication, especially regarding risk and benefit perceptions, relatively little attention has been paid to the application of the knowledge gap hypothesis in the context of pork. The knowledge gap hypothesis has been applied in studies examining knowledge gaps in food and nutrition, where SES plays a pivotal role (e.g., Campbell et al., 2013; Qu et al., 2018; Variyam et al., 1999; Wardle et al., 2000). Multiple studies have found that SES significantly influences the increased consumption of fruits, vegetables, fish, and white meats, emphasizing the role of education in shaping dietary habits (Northstone et al., 2005; Vilela et al., 2020). However, findings on the relationship between SES and knowledge in food and agriculture do not always align with the knowledge gap hypothesis. For example, Qu et al.'s study (2018) found a weak association between consumers' knowledge level of blueberry health benefits and education, and no significant association with income. This finding suggests factors beyond income and education may influence knowledge acquisition for specific food products. Several scholars have argued that other individual-level drivers, such as intrinsic motivation and interests, can be stronger predictors of knowledge level than SES (Genova & Greenberg, 1979; Kwak, 1999; Qu et al., 2018).

Knowledge Gap and Misinformation

Research derived from cognitive and social psychology has shown evidence that misbeliefs are difficult to correct because mechanisms such as confirmation bias (Nickerson, 1998) and motivated reasoning (Kunda, 1990) are activated when misinformation is first adopted and believed. The correction is difficult even when fact-based information is provided (Nyhan, 2020). Misinformation, often understood as inadvertently false or incomplete content, can proliferate through social networks, news outlets, and peer discussions, unintentionally misleading those who lack knowledge and rigorous fact-checking capabilities (Scheufele & Krause, 2019; Wardle & Derakhshan, 2017).

Knowledge has been measured by testing participants' ability to answer questions correctly across disciplines (e.g., Gerosa et al., 2021; Qu et al., 2018). Incorrect answers on knowledge tests can be interpreted as a lack of knowledge and indicate the presence of misinformation (Hmielowski et al., 2014; Kahlor & Rosenthal, 2009; Lindgren et al., 2022). Even individuals with prior accurate knowledge are not immune; Fazio et al. (2015) found that misinformation, such as the idea that vitamin C prevents the common cold, enters our knowledge

through repeated exposure. Similarly, participants repeatedly exposed to the false statement, "A date is a dried plum," increasingly perceived it as truthful, despite knowing beforehand the correct information that a prune, not a date, is a dried plum (Fazio et al., 2015, p. 30). This example illustrates that statements we encounter repeatedly are processed more fluently, making us more likely to regard them as true compared to new statements. In a time when misinformation has reached "crisis proportions," individuals' information-seeking efforts can easily be compromised by preconceived notions and biases (West & Bergstrom, 2021, p. 1).

Consumer Perceptions of Pork

Pork is one of the most extensively consumed meats globally. It accounts for approximately 30% of the world's total meat consumption (Penkert et al., 2021; Vicente & Pereira, 2024). Consumer perceptions of meat, such as pork, vary based on several factors: nutritional content, price, flavor, and perceived health impacts. Red meat, such as pork, is generally seen as healthy, though slightly less so than chicken and fish (Escribá-Pérez et al., 2017; Grimshaw, 2013; Mafruchati, 2020).

Perceptions of pork are mixed, although it is widely consumed and enjoyed for its taste and versatility (Larsson & Orsini, 2014; Libera et al., 2021; Miller, 2020). In terms of health concerns towards pork, consumers often associate pork with higher cardiovascular disease risk due to its fatty acid profile, even though research studies have shown the health benefits of consuming lean pork, such as its ability to favorably modulate blood lipid levels (Davidson et al., 1999; Hunninghake et al., 2000; Stewart et al., 2001; Vicente & Pereira, 2024). Additionally, despite its nutrient density, consumers often overestimate pork's cholesterol content compared to beef (Damico et al., 2020) while underestimating that lean pork provides high-quality protein and key micronutrients such as thiamin, vitamins B6 and B12, and iron (Penkert et al., 2021). Another health concern is the perception that growth hormones are commonly used in pork production, although growth hormones are prohibited in pork production in the U.S. (U.S. Food and Drug Administration [FDA], 2024; Yang et al., 2020). Furthermore, consumers lack knowledge about the food safety of pork production and show greater concern about chemical hazards and smoking-related risks than about the more common threat of microbial contamination (Le et al., 2022). Besides the health- and safety-related concerns, consumer perceptions of pork are also shaped by culturally informed dietary preferences, which influence how pork is evaluated, accepted, or avoided across different populations (Ekanem et al., 2013; Khanal & Dhoubhadel, 2023).

Animal welfare is another significant factor influencing consumer perceptions. While consumers enjoy incorporating meat into their diets, many are concerned about animal safety and welfare (Cummins et al., 2016). These concerns often trigger moral emotions, particularly guilt, empathy, and disgust, which can directly dampen meat appetite (Loughnan et al., 2014; Peden et al., 2020; Ruby, 2012). Public awareness of transportation conditions, animal well-being, slaughter practices, and antimicrobial use, including concerns about antimicrobial resistance, has increased, not only by high-profile media reports, documentaries, and advocacy campaigns but also by word-of-mouth from friends and family (Ding et al., 2022; Petrie, 2019; Rice et al., 2020; Tonsor & Olynk, 2011). These media coverage and interpersonal conversations successfully generated negative perceptions of the industry and created room for emotionally charged and

unverified information to influence the consumers' food choices (Rice et al., 2020; Rumble & Buck, 2013; Sinclair et al., 2018; Tiplady et al., 2013).

Consumer perceptions of pork are highly sensitive to the type of information they receive. A message-testing study conducted by Verbeke and Liu (2014) showed that exposure to positive information about pork significantly enhanced perceptions of its healthiness and safety, providing a more favorable attitude toward consumption among Chinese consumers. Conversely, negative information led to a significant decline in perceptions across multiple attributes, such as nutritional value, healthiness, safety, and even price, demonstrating the broad and adverse impact of unfavorable messaging (Verbeke & Liu, 2014).

Perception-Based Knowledge Gaps

Consumer perceptions shape attitudes toward meat and affect information-seeking behaviors, which can widen existing knowledge gaps through mechanisms such as confirmation bias (Nickerson, 1998). Dickinson and Kakoschke (2021) demonstrated this bias in food choices by finding that consumers intentionally avoided or undervalued information that contradicted their existing food-related beliefs, while reinforcing existing perceptions instead of challenging them. Similarly, in health communication, Piksa et al. (2024) found that participants skeptical of COVID-19 vaccination were more prone to confirmation bias and therefore more susceptible to fake news. Conversely, individuals holding favorable views of vaccination showed lower levels of confirmation bias and greater resistance to misinformation. These findings suggest that confirmation bias operates as a general cognitive tendency and shapes the way individuals process information. This tendency can lead people to accept false or unsupported information that aligns with their existing beliefs and to resist corrective information that contradicts them (Flynn et al., 2017).

Motivated reasoning further strengthens this bias by engaging individuals' cognitive resources to defend their existing beliefs (Epley & Gilovich, 2016; Kunda, 1990). Rather than passively consuming attitude-consistent content, people who use motivated reasoning scrutinize disconfirming evidence more critically and rationalize supportive information more readily (Epley & Gilovich, 2016; Taber & Lodge, 2006). For instance, those with a favorable view of pork may criticize news reports of legitimate pork-related safety concerns or simply disregard them, while eagerly embracing articles that highlight pork's benefits, and vice versa.

Emotions can take the cognitive biases to the next level. Experimental research in political communication shows that anger heightens motivated reasoning, reduces information seeking, and decreases receptivity to factual corrections (Garrett & Weeks, 2013; Weeks, 2015). Although the study examined political misinformation, similar cognitive and affective processes may also operate in controversial food production debates, especially meat consumption. Several studies have shown supporting evidence. For example, Inannidou et al. (2023) found that omnivores reported less guilt about consuming meat than pescatarians, vegetarians, and vegans, while holding stronger beliefs that justify their food choices. The interaction between emotions and motivated reasoning can be further exacerbated by digital platforms and social media algorithms, which deliver content tailored to users' existing beliefs and interests and reinforce confirmation bias rather than exposing users to diverse or corrective viewpoints (Cinelli et al., 2021; Ghani & Rahmat, 2023).

Such selective exposure, driven by perceptions, subsequently leads consumers to seek, avoid, and obtain information differently, further widening the knowledge gap. Consumers already skeptical of pork's nutritional value or safety tend to focus disproportionately on negative information by selectively filtering out evidence that contradicts their negative stance. Those with positive perceptions selectively attend to affirming messages while neglecting potential concerns, thereby further entrenching their views and reducing the accuracy and breadth of their knowledge (Dickinson & Kakoschke, 2021; Verbeke & Liu, 2014). Therefore, we propose that positive and negative perceptions of meat will bias information seeking and processing, causing perception-based knowledge gaps.

Purpose and Objectives

This study explored factors contributing to the knowledge gap about pork by focusing on the impact of consumer meat–related perceptions and socioeconomic status (SES), specifically consumers' income and education levels. The research was guided by three primary objectives:

1. Identify consumers' knowledge level about pork.
2. Determine how income and educational levels influence consumer knowledge about pork.
3. Determine how positive and negative perceptions toward meat influence consumer knowledge about pork.

Methods

This research was part of an extensive study examining public perceptions of pork, meat, and new foods, as well as public trust in organizations and individuals that impact these perceptions. An online survey instrument was developed and distributed via Qualtrics in July 2024. Quotas set *a priori* aligned with the 2024 U.S. census data to ensure respondents were representative of the geographic, sex, age, race, and ethnicity of U.S. residents, age 18 or older. A total of 1,011 responses were obtained.

Among others, the questionnaire was comprised of seven statements aimed at assessing consumers' knowledge regarding pork production (e.g., Most pigs raised for pork are treated with antibiotics only when sick). These statements were developed based on scientific information readily available online through USDA reports and peer-reviewed journal articles. The entire instrument was verified by a panel of experts in survey research design, agricultural education, agricultural communication, leadership, and animal science for face and content validity.

The survey respondents were instructed to identify each of the knowledge statements as "true" or "false." All statements were true, which means if respondents answered "true" for each statement, they answered it correctly. To reduce response sets, the survey included multiple attention checks and a speeder check to identify inattentive or rushed responding. Each accurately answered question was considered worth one point; therefore, the total knowledge score could range from a minimum of zero to a maximum of seven.

To measure positive and negative perceptions, the Meat Attachment Questionnaire (Graca et al., 2015) was used. Specifically, respondents were asked to indicate their level of agreement or disagreement with eleven positive statements (e.g., "Meat is irreplaceable in my diet") (α = .92) and five negative statements (e.g., "I feel bad when I think about eating meat") (α = .87) about meat on a five-point Likert scale (*1 = strongly disagree* to *5 = strongly agree*). The real limits set for the five-point scale to interpret the perception statements were: 1.00 – 1.49 = *strongly disagree*, 1.50 – 2.49 = *somewhat disagree*, 2.50 – 3.49 = *neither disagree nor agree*, 3.50 – 4.49 = *somewhat agre*e, and 4.50 – 5.00 = *strongly agree*. The mean of the positive and negative scales was calculated by averaging the scores of their respective statements.

Additionally, respondents' demographics, including education level, household income, age, gender, and race were collected, while education level and household income were of interest for this study. Education was measured with six ordered categories: less than 12th grade (no high-school diploma), high-school graduate or GED, some college with no degree, a 2-year college degree (associate/technical), a 4-year college degree (bachelor's), and a graduate or professional degree (e.g., master's, MBA, PhD). Household income was recorded across six income ranges: ≤ $24,999; $25,000-49,999; $50,000-74,999; $75,000-149,999; $150,000-249,999; and ≥ $250,000.

To ensure reliability, the survey instrument was pilot tested with 50 individuals that are representative of the population. University of Georgia Institutional Review Board approved the protocol of the study (IRB #00008098). SPSS was used to analyze data. Descriptive statistics were conducted to calculate the means and frequencies of each variable. Inferential tests, including one-way ANOVA and Pearson's correlation, were used to perform inferential statistics. The strength of correlations was interpreted according to Cohen's (1988) guidelines for effect sizes, where r = .10, .30, and .50 represent small (weak), medium (moderate), and large (strong) effects, respectively. The authors used Grammarly Pro and Microsoft Copilot to improve grammar, word choice, and flow. All suggestions made by the generative AI tools were reviewed and edited thoroughly to ensure accuracy of the intended meaning.

Results

Most respondents' income fell between $25,000 and $49,999 (28%) and less than $24,999 (23.5%). Regarding educational attainment, 24.9% completed high school, 23.8% attended some college, and 2.7 % did not graduate from high school. Regarding age, 18.6% of respondents were between 18 and 34 years old, 22.9% were between 35 and 54, and 18.4% were 55 or older. With respect to gender, 46% identified as male and 54.0% as female (see Table 1).

Table 1

Demographic Characteristics of the Respondents

Demographic Categories	*f*	*%*
Education		
Less than 12th grade (did not graduate high school)	27	2.7
High school graduate (includes GED)	252	24.9
Some college, no degree	241	23.8

Demographic Categories	*f*	*%*
2-year college degree (Associates, Technical, etc.)	127	12.6
4-year college degree (Bachelor's, etc.)	230	22.7
Graduate or Professional degree (Master's, Ph.D., M.B.A., etc.)	134	13.3
Income		
$24,999 or less	238	23.5
$25,000 to $49,999	283	28
$50,000 to $74,999	208	20.6
$75,000 to $149,999	207	20.5
$150,000 to $249,999	51	5
$250,000 or more	24	2.4
Gender		
Male	465	46.0
Female	546	54.0
Race		
Hispanic/Latino(a)/Chicano(a) (e.g., Mexican, Puerto Rican)	190	18.8
American Indian or Alaska Native	64	6.3
Asian or Pacific Islander	71	7.0
Black or African American	149	14.7
White	757	74.9
Other	45	4.5

Objective 1: Identify Consumers' Knowledge Level about Pork

Seven true statements regarding pork production were presented to respondents in the survey and they were asked to evaluate each statement as true or false. The accuracy of responses demonstrated considerable variability across the statements. On average, the respondents answered more than half of the seven questions correctly ($M = 4.67$, $SD = 1.55$). For instance, the majority of respondents correctly identified that "Most pigs raised for pork are raised in group housing systems" (76.8%) and "Most pigs raised for pork are born and raised on the same farm from birth until harvested for meat" (75.3%). About half of respondents correctly recognized that "Most of the pigs raised for pork are fed a vegetarian diet" (53.3%; see Table 2).

Table 2

Knowledge Statements about Pork

Knowledge Statements	True/False of the statement	*M*	*SD*	Correct *n*	Correct *%*
Most of the pigs raised for pork are raised in group housing system	T	.77	.423	776	76.8

Knowledge Statements	True/False of the statement	*M*	*SD*	Correct *n*	Correct *%*
Most pigs raised for pork are born and raised on the same farm from birth until harvested for meat	T	.75	.432	761	75.3
Most of the pigs raised for pork are raised on farms with more than 1,000 total pigs	T	.72	.449	728	72
Most pigs raised for pork are raised in situations where they are permitted social interactions with other pigs	T	.69	.463	697	68.9
Most pigs raised for pork have access to the outdoors at least some portion of each day	T	.66	.473	670	66.3
Most of the pigs raised for pork are treated with antibiotics only when sick	T	.55	.498	555	54.9
Most of the pigs raised for pork are fed a vegetarian diet	T	.53	.499	539	53.3

Note. Accurate responses (T) were coded as 1, and inaccurate responses (F) were coded as 0.

Objective 2: Determine how Income and Educational Levels Influence Consumer Knowledge

The analysis of respondents' knowledge levels across income groups is summarized in the mean knowledge scores shown in Table 3. A one-way ANOVA was conducted to compare the mean knowledge scores among the income levels. The results indicated no statistically significant differences in knowledge scores between income groups ($F = .42$, $p = .83$, $\eta^2 = .002$) (see Table 3).

Table 3

One-Way ANOVA Test of Respondents' Knowledge Level among Different Income Groups

Annual Income	*n*	*M*	*SD*	*F*	*p*
$24,999 or less	238	4.64	1.55	.424	.832
$25,000 to $49,999	283	4.62	1.63		
$50,000 to $74,999	208	4.68	1.52		
$75,000 to $149,999	207	4.76	1.44		

Annual Income	*n*	*M*	*SD*	*F*	*p*
$150,000 to $249,999	51	4.86	1.73		
$250,000 or more	24	4.50	1.59		

A one-way ANOVA was conducted to compare the mean knowledge scores between education levels. There were no statistically significant differences in knowledge scores among education levels ($F = 1.42$, $p = .21$, $\eta^2 = 0.007$). These findings indicate that pork knowledge is relatively uniform across different education groups despite slight variations in mean scores (see Table 4).

Table 4

One-Way ANOVA Test of Respondents' Knowledge Level among Different Education Levels

Education Level	*n*	*M*	*SD*	*F*	*p*
Less than 12th grade (did not graduate high school)	27	4.85	1.78	1.424	.213
High school graduate (includes GED	252	4.81	1.49		
Some college, no degree	241	4.61	1.50		
2-year college degree (Associates, Technical, etc.)	127	4.41	1.60		
4-year college degree (Bachelor's, etc.)	230	4.66	1.50		
Graduate or Professional degree (Master's, Ph.D., M.B.A., etc.)	134	4.78	1.74		

Objective 3: Determine how Positive and Negative Perceptions toward Meat Influence Consumer Knowledge about Pork

To evaluate attitudes toward meat consumption, respondents were presented with 11 positive and five negative statements, asking them to indicate their level of agreement or disagreement. They somewhat agreed with the positive statements about meat ($M = 3.69$, $SD = .87$) and somewhat disagreed with the negative statements ($M = 2.30$, $SD = 1.03$). The distribution of positive responses is detailed in Table 5.

Table 5

Positive Attitude Toward Meat Consumption

Positive Statements	Strongly disagree (%)	Somewhat disagree (%)	Neither disagree nor agree (%)	Somewhat agree (%)	Strongly agree (%)
I love meals with meat	4.1	4.6	13.2	38.5	39.7
A good steak is without comparison	8.1	6.7	20.0	26.6	38.6
I do not picture myself removing meat from my diet	6.9	7.7	15.7	31.5	38.2
I am a big fan of meat	5.8	6.0	16.9	34.0	37.2
Eating meat is one of the good pleasures in life	4.5	4.6	16.6	40.5	33.8
Meat is irreplaceable in my diet	8.7	13.3	16.6	32.1	29.3
Eating meat is a natural and undisputable practice	5.5	5.2	23.0	37.1	29.1
According to our position in the food chain, we have the right to eat meat	5.6	6.7	28.7	30.4	28.6
Eating meat is an unquestionable right of every person	7.2	7.7	28.3	28.7	28.1
If I was forced to stop eating meat, I would feel sad	14.1	13.7	19.7	28.1	24.3
If I could not eat meat, I would feel weak	16.8	17.6	29.1	22.4	14.1

The distribution of negative responses is detailed in Table 6.

Table 6

Negative Attitude Toward Meat Consumption

Negative Statements	Strongly disagree (%)	Somewhat disagree (%)	Neither disagree nor agree (%)	Somewhat agree (%)	Strongly agree (%)
I would feel fine with a meatless diet	24.9	21.2	21.9	20.7	11.4
By eating meat, I am reminded of the death and suffering of animals	38.5	21.1	19.4	13.6	7.4
I feel bad when I think about eating meat	36.7	22.9	17.6	15.9	6.8
Eating meat is disrespectful towards life and the environment	40.0	26.1	18.9	10.2	4.8
Meat reminds me of diseases	48.1	22.9	15.9	8.4	4.6

For positive statements, high levels of agreement were observed for statements emphasizing the enjoyment and significance of meat. The majority of respondents (78.2%) strongly or somewhat agreed that "I love meals with meat," while only 8.7% strongly or somewhat disagreed. Similarly, 74.3% believed that "Eating meat is one of the good pleasures in life." Likewise, 69.7% strongly or somewhat agreed that "I do not picture myself removing meat from my diet," and other statements showed somewhat lower combined agreement levels. Only 59.0% strongly or somewhat agreed that "According to our position in the food chain, we have the right to eat meat," and 56.8% strongly or somewhat agreed that "Eating meat is an unquestionable right of every person." The lowest agreement among the positive statements was observed for "If I could not eat meat, I would feel weak," where 36.5% strongly or somewhat agreed compared to 34.4% who strongly or somewhat disagreed.

In contrast, respondents predominantly disagreed with statements expressing negative attitudes toward meat consumption. A consistent 59.6% of respondents strongly or somewhat disagreed with both statements: "By eating meat I am reminded of the death and suffering of animals," and "I feel bad when I think about eating meat." Moreover, a strong majority rejected the notion that "Eating meat is disrespectful towards life and the environment" (66.1% strongly or somewhat disagreed) and that "Meat reminds me of diseases" (71.0% strongly or somewhat disagreed, while 13% agreed or strongly agreed). Conversely, agreement with these negative statements was relatively low, ranging from 13.0% to 32.1%. Notably, while 32.1% strongly or

somewhat agreed with "I would feel fine with a meatless diet," this still represents a minority when compared to the 46.1% who strongly or somewhat disagreed.

A weak positive correlation was found between knowledge score and positive meat perception ($r = .25$, $p < .01$). Conversely, a weak negative correlation was observed between knowledge score and negative meat perception ($r = -.19$, $p < .01$; see Table 7). In other words, positive meat perception was significantly associated with higher knowledge level, whereas negative meat perception was significantly associated with lower consumer knowledge about pork.

Table 7

Correlation of Meat Perception Variables with Knowledge Scores

Variables	*M*	*SD*	1	2	3
Consumer knowledge	4.67	1.55			
Positive meat perception	3.69	.88	.250**	-	
Negative meat perception	2.30	1.03	-.188**	-	-

Note. $^{**}p < 0.01$

Discussion and Conclusion

The present study examined the knowledge gap about pork among U.S. consumers, focusing on the influence of SES and consumer perceptions. A central expectation from classic knowledge gap theory (Tichenor et al., 1970) is that socio-economic advantages facilitate greater knowledge gain. However, the results indicated neither income nor education significantly impacted consumers' knowledge of pork. This finding challenges the results of previous literature (e.g., Gaziano, 1997; Hwang & Jeong, 2009; Lind & Boomgaarden, 2019; Moore, 1987; Salmon et al., 1996; Viswanath et al., 1991; Viswanath et al., 1993). While prior research has consistently linked higher SES to greater food-related knowledge (Campbell et al., 2013; Variyam et al., 1999; Wardle et al., 2000) and increased consumption of healthy food and shaping dietary habits (Northstone et al., 2005; Vilela et al., 2020), this study found no such relationship in the context of pork. This suggests that knowledge acquisition about pork is not as strongly tied to income and highest educational level attained as previously assumed. Specifically, socioeconomic factors alone cannot explain knowledge disparities about pork among U.S. consumers, as Qu et al. (2018) found about blueberries. These findings suggest that socioeconomic factors do not have much explanatory power about food-related knowledge gaps.

Knowledge inequalities are often topic-specific. Gaps influenced by education tend to be narrower for health and science subjects compared to public affairs issues (Hwang & Jeong, 2009; Lind & Boomgaarden, 2019). To explain this phenomenon, pork consumption is first and foremost a practical, everyday topic for many consumers, and can be experienced readily at the individual level. It does not require privileged status to discuss eating pork or to actually have such a consumption experience. Second, information and misinformation about pork are readily available through media, supermarkets, and social circles. In their meta-analysis of knowledge gap research, Hwang and Jeong (2009) observed that subjects such as international and socio-

political issues tend to result in larger knowledge gaps. Pork may fall into the category of personally relevant knowledge that individuals with high or low SES can pick up through daily life using similar media channels. Information about modern pork production practices, such as animal housing, swine disease information, and animal transportation, often reaches consumers via news coverage, documentaries, and word-of-mouth rather than solely via formal education (Ding et al., 2022; Rice et al., 2020; Rumble & Buck, 2013; Sinclair et al., 2018; Tiplady et al., 2013; Tonsor & Olynk, 2011). To further illustrate this point, 90% of U.S. adults own a smartphone, while smartphone ownership is 79% among adults in households earning less than $30,000 annually. Further, 28% of U.S. consumers in this income group rely on their smartphones for internet access (Gelles-Watnick, 2024). The wide mobile access enables both economically advantaged and disadvantaged consumers to engage with digital content. Free platforms such as social media channels and grocery retailer apps disseminate pork-related content such as recipes and farm videos, which makes such information readily available to all regardless of income. The affordability and ubiquity of mobile media have allowed basic pork information to be widely available to both higher and lower SES audiences.

Since socio-economic status, especially income and education, were not found to be associated with differing knowledge levels in the topic area of meat, our findings point to consumer perceptions and attitudes as the key differentiating factors. Positive attitudes toward meat were weakly but positively associated with higher pork knowledge scores, suggesting that consumers who view meat as healthy, enjoyable, or an essential part of their diet tend to answer more knowledge items correctly. Conversely, negative attitudes such as perceiving meat as unhealthy, unethical, or undesirable were weakly but significantly associated with lower factual understanding of pork. Attitudes likely shape knowledge acquisition through confirmation bias, leading individuals to favor information that aligns with their pre-existing views (Dickinson & Kakoschke, 2021; Nickerson, 1998; Piksa et al., 2024). This pattern suggests that attitudes and perceptions may influence information processing more strongly than income or educational attainment.

Motivated reasoning further explains this effect as individuals tend to interpret new information in ways that support their existing attitudes, thereby reducing the effectiveness of factual corrections. Individuals preserve their existing attitudes by selectively attending to confirmatory information and discounting contradictory evidence (Epley & Gilovich, 2016; Kunda, 1990; Taber & Lodge, 2006). Applied to our findings, this suggests that consumers with unfavorable views of meat could be engaging in motivated reasoning when presented with information affirming pork safety, downplaying its credibility, questioning its methodology, or disregarding its relevance. While unfavorable views were more strongly linked to misinformation in this study, motivated reasoning can also operate among consumers with favorable views of pork, suggesting that positive attitudes may likewise bias information processing. Political communication research suggests that misinformation often arises from motivated reasoning, in which individuals are more likely to believe information that aligns with their existing attitudes, regardless of its accuracy (Garrett & Weeks, 2013; Weeks, 2015). As a result, they may be more vulnerable to misinformation that aligns with their pre-existing concerns. Moreover, personal factors such as intrinsic motivation and interest can outweigh SES in driving knowledge gains (Genova & Greenberg, 1979; Kwak, 1999; Qu et al., 2018). These findings point toward a perception-driven knowledge gap in which consumer attitudes may

influence not only what information individuals seek but also how that information is interpreted and retained.

Approximately one-fifth of respondents (22.7%) reported feeling bad when thinking about eating meat. This emotional discomfort suggests that ethical concerns and feelings of guilt or empathy toward animals influence attitudes toward meat consumption (Loughnan et al., 2014; Peden et al., 2020; Ruby, 2012). Such emotions can leave consumers susceptible to misinformation or widen knowledge gaps, independent of SES, by motivating consumers either to avoid dissonant information or to seek out content that justifies their feelings (Sharma et al., 2022). That perception may be linked to how environmental issues are often presented in public discourse, which frames livestock, especially red meat, as a leading cause of greenhouse gas emissions (Kristiansen et al., 2021; Smith et al., 2025). Media framing plays a central role in shaping climate beliefs and behaviors, and reductions in red meat consumption are often presented as environmentally beneficial (Booth et al., 2025). However, a recent study shows that fresh pork's greenhouse gas emissions fall considerably below those of beef and lamb, and are comparable to lower-impact proteins such as chicken and beans (Drewnowski, 2024). Similarly, the observation that 13% of respondents associated meat with disease in our study reflects a fear-based schema that often opens the door to food-safety misinformation, mirroring the consumer misunderstanding presented by Kashyap et al. (2024) in the hypothetical swine disease scenario.

This dynamic is further intensified by the misinformation itself. In general, pork-related misinformation is negatively framed. Several authors have reported claims that pork contains more cholesterol than other proteins or that antibiotic abuse is widespread (Damico et al., 2020; Zhou et al., 2025). Such fear-based narratives circulate easily because they resonate with consumers' pre-existing concerns about food production. Supporting this, Piksa et al. (2024) found in the context of vaccination that people with favorable attitudes are more resistant to misinformation, whereas those with unfavorable attitudes are especially vulnerable. Together, these insights imply that by promoting positive attitudes toward meat, we could help improve the ability of individuals to combat misinformation.

Although pork consumption is not a politically polarizing issue on the scale of topics like climate change, it does carry value-laden dimensions such as personal health beliefs, ethical concerns about animal welfare (Cummins et al., 2016; Loughnan et al., 2014; Peden et al., 2020; Ruby, 2012), and culturally rooted dietary preferences (Ekanem et al., 2013; Khanal & Dhoubhadel, 2023). Consequently, pork-related knowledge in this study appears to be more closely associated with individual perceptions than with socioeconomic constraints suggesting that factors such as personal interest and cultural context may play an important role in shaping knowledge outcomes.

Recommendations

Bridging the knowledge gap about pork among U.S. consumers demands evidence-based strategies that address both factual misunderstandings and consumer perceptions. Based on our findings, efforts should move beyond simply debunking the misinformation the same way to all misinformed consumers. Since motivated reasoning and confirmation bias influence consumers' interpretation of information, communication strategies should dissect the specific biases and motivations that the audience relies on, and strategically build trust, align values, and emphasize

personal relevance. Stakeholders in the food and agriculture sectors, such as extension educators, health professionals, and industry communicators, should use storytelling to include personal narratives from farmers, veterinarians, and nutrition experts to humanize pork production. Such narratives enhance credibility and make scientific and production-related information more digestible and appealing.

Although SES has traditionally been viewed as the primary determinant of individuals' ability to acquire new information (Tichenor et al., 1970), our findings indicate its influence on pork knowledge may be less pronounced in today's media environment. Therefore, we recommend further research examining how additional constructs such as media literacy and the dynamics of modern communication channels may influence knowledge gaps. Scholars can develop more accurate theories for identifying and bridging modern knowledge gaps, and policymakers can craft strategies closely aligned with how consumers access and process information today.

Future research should operationalize and test the perception-driven knowledge gap framework. This direction will help examine cognitive mechanisms such as motivated reasoning and confirmation bias and explore how these processes interact with other factors such as media consumption habits. Future research should also assess these mechanisms across both negative and positive orientations toward pork and agricultural production, as motivated reasoning may also manifest as motivated favoritism among those with favorable attitudes or strong institutional trust. In this study, negative perceptions of pork were found to be associated with a lower level of knowledge about pork. Considering the emotional connection people have with food, future studies should explore how negative emotions such as disgust, fear, guilt, or anger influence information-seeking behavior and subsequently influence their susceptibility to misinformation in the agricultural and food. Studies should also incorporate values-based measures (e.g., ethical, environmental, and health concerns) and use both factual and value-based statements to assess consumers' ability to distinguish accurate information from misinformation.

Replication of this study should be considered, especially in different cultural contexts, such as in a regional community or a country where pork is integrated more deeply into their cuisine than it is in the U.S. This approach can help assess the generalizability of these results. Communication strategies must then be adapted to each unique food tradition and belief system by crafting messages that align with culinary norms and values. Developing these culturally appropriate strategies will ensure that educational interventions resonate across diverse demographic groups and facilitate knowledge acquisition regarding pork consumption worldwide.

Limitations

A limitation of the study is that all knowledge items were "True," which may increase the risk of respondents selecting the same answer for all items without carefully evaluating each statement. In addition, single-statement true/false items may allow respondents to answer correctly through guessing and may not fully capture the depth of respondents' understanding of pork production practices. Although this format was appropriate for measuring baseline factual knowledge in a national survey, future research should incorporate a balanced mix of true and false items and use multiple items per concept to strengthen measurement robustness. Further,

alternative assessment formats, such as multiple-true-false questions, have been shown to reduce guessing and better capture conceptual understanding (Brassil & Couch, 2019).

References

Agarwal, S., & Fulgoni, V. L., III. (2023). Association of pork (all pork, fresh pork and processed pork) consumption with nutrient intakes and adequacy in US children (age 2–18 years) and adults (age 19+ years): NHANES 2011–2018 analysis. *Nutrients, 15*(10), Article 2293. https://doi.org/10.3390/nu15102293

Ajetunmobi, O. A., & Laobangdisa, S. (2024). The effect of cultural and socio-economic factors on consumer perception. In D. Bogueva (Ed.), *Consumer perceptions and food* (pp. 23–44). Springer. https://doi.org/10.1007/978-981-97-7870-6_2

Bao, H., & Lee, E. W. (2023). Knowledge gap hypothesis. In E. Y. Ho, C. L. Bylund, & J. C. Weert (Eds.), The *International Encyclopedia of Health Communication* (pp. 1–6). John Wiley & Sons. https://doi.org/10.1002/9781119678816.iehc0773

Barakat, C., & Konstantinidis, T. (2023). A review of the relationship between socioeconomic status change and health. *International Journal of Environmental Research and Public Health, 20*(13), Article 6249. https://doi.org/10.3390/ijerph20136249

Booth, A., Blake, D., & Breheny, M. (2025). Who's responsible? A media framing analysis of climate change and meat reduction in Aotearoa New Zealand. *Health Promotion International, 40*(3), Article daaf065. https://doi.org/10.1093/heapro/daaf065

Bradford, H., McKernan, C., Elliott, C., & Dean, M. (2022). Consumers' perceptions and willingness to purchase pork labelled 'raised without antibiotics.' *Appetite, 171,* Article 105900. https://doi.org/10.1016/j.appet.2021.105900

Brassil, C. E., & Couch, B. A. (2019). Multiple-true-false questions reveal more thoroughly the complexity of student thinking than multiple-choice questions: A Bayesian item response model comparison. *International Journal of STEM Education, 6*, Article 16. https://doi.org/10.1186/s40594-019-0169-0

Campbell, K. J., Abbott, G., Spence, A. C., Crawford, D. A., McNaughton, S. A., & Ball, K. (2013). Home food availability mediates associations between mothers' nutrition knowledge and child diet. *Appetite, 71*, 1–6. https://doi.org/10.1016/j.appet.2013.07.006

Cinelli, M., De Francisci Morales, G., Galeazzi, A., Quattrociocchi, W., & Starnini, M. (2021). The echo chamber effect on social media. *Proceedings of the National Academy of Sciences of the United States of America, 118*(9), Article e2023301118. https://doi.org/10.1073/pnas.2023301118

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Lawrence Erlbaum Associates. https://doi.org/10.4324/9780203771587

Cummins, A. M., Widmar, N. J. O., Croney, C. C., & Fulton, J. R. (2016). Understanding consumer pork attribute preferences. *Theoretical Economics Letters, 6*(2), 166–177. https://doi.org/10.4236/tel.2016.62019

Damico, A. B., Aulicino, J. M., & Di Pasquale, J. (2020). Perceptions and preconceptions about chicken and pork meat: A qualitative exploratory study of Argentine consumers in the

metropolitan area of Buenos Aires. *Sustainability, 12*(17), Article 6729. https://doi.org/10.3390/su12176729

Davidson, M. H., Hunninghake, D., Maki, K. C., Kwiterovich, P. O., Jr., & Kafonek, S. (1999). Comparison of the effects of lean red meat vs lean white meat on serum lipid levels among free-living persons with hypercholesterolemia: A long-term, randomized clinical trial. *Archives of Internal Medicine, 159*(12), 1331–1338. https://doi.org/10.1001/archinte.159.12.1331

de Araújo, P. D., Araújo, W. M. C., Patarata, L., & Fraqueza, M. J. (2022). Understanding the main factors that influence consumer quality perception and attitude towards meat and processed meat products. *Meat Science, 193*, Article 108952. https://doi.org/10.1016/j.meatsci.2022.108952

Dickinson, D. L., & Kakoschke, N. (2021). Seeking confirmation? Biased information search and deliberation in the food domain. *Food Quality and Preference, 91*, Article 104189. https://doi.org/10.1016/j.foodqual.2021.104189

Ding, Q., Gao, J., Ding, X., Huang, D., Zhao, Y., & Yang, M. (2022). Consumers' knowledge, attitude, and behavior towards antimicrobial resistance and antimicrobial use in food production in China. *Frontiers in Public Health, 10*, Article 1015950. https://doi.org/10.3389/fpubh.2022.1015950

Drewnowski, A. (2024). Perspective: The place of pork meat in sustainable healthy diets. *Advances in Nutrition, 15*(5). Article 100213 https://doi.org/10.1016/j.advnut.2024.100213

Ekanem, E., Mafuyai-Ekanem, M., Tagegne, F., Singh, S., & Favors, D. (2013). Goat meat consumer preferences: Implications for goat meat marketing in metropolitan Nashville, Tennessee area. *Journal of Food Distribution Research, 44*(1), 1–9. https://doi.org/10.22004/ag.econ.158770

Epley, N., & Gilovich, T. (2016). The mechanics of motivated reasoning. *Journal of Economic Perspectives, 30*(3), 133–140. https://doi.org/10.1257/jep.30.3.133

Escribá-Pérez, C., Baviera-Puig, A., Buitrago-Vera, J., & Montero DeVicente, L. (2017). Consumer profile analysis for different types of meat in Spain. *Meat Science, 129*, 120–126. https://doi.org/10.1016/j.meatsci.2017.02.015

Fazio, L. K., Brashier, N. M., Payne, B. K., & Marsh, E. J. (2015). Knowledge does not protect against illusory truth. *Journal of Experimental Psychology: General, 144*(5), 993-1002. https://doi.org/10.1037/xge0000098

Flynn, D. J., Nyhan, B., & Reifler, J. (2017). The nature and origins of misperceptions: Understanding false and unsupported beliefs about politics. *Political Psychology, 38*, 127–150. https://doi.org/10.1111/pops.12394

Fretz, A., Schneider, A. L. C., McEvoy, J. W., Hoogeveen, R., Ballantyne, C. M., Coresh, J., & Selvin, E. (2016). The association of socioeconomic status with subclinical myocardial damage, incident cardiovascular events, and mortality in the ARIC study. *American Journal of Epidemiology, 183*(5), 452–461. https://doi.org/10.1093/aje/kwv253

Garrett, R. K., & Weeks, B. E. (2013). The promise and peril of real-time corrections to political misperceptions. In *Proceedings of the 2013 Conference on Computer Supported Cooperative Work (CSCW)* (pp. 1047–1058). ACM. https://doi.org/10.1145/2441776.2441895

Gaziano, C. (1997). Forecast 2000: Widening knowledge gaps. *Journalism & Mass Communication Quarterly, 74*(2), 237–264. https://doi.org/10.1177/107769909707400202

Gelles-Watnick, R. (2024, January 31). Americans' use of mobile technology and home broadband. *Pew Research Center*. https://www.pewresearch.org/internet/2024/01/31/americans-use-of-mobile-technology-and-home-broadband/

Genova, B. K. L., & Greenberg, B. S. (1979). Interests in news and the knowledge gap. *Public Opinion Quarterly, 43*(1), 79–91. https://doi.org/10.1086/268493

Gerosa, T., Gui, M., Hargittai, E., & Nguyen, M. H. (2021). (Mis)informed during COVID-19: How education level and information sources contribute to knowledge gaps. *International Journal of Communication, 15*, 2196–2217. https://ijoc.org/index.php/ijoc/article/view/16438

Ghani, A. N. H. B. A., & Rahmat, H. (2023). Confirmation bias in our opinions on social media: A qualitative approach. *Journal of Communication, Language and Culture, 3*(1), 44–53. https://doi.org/10.33093/jclc.2023.3.1.4

Glymour, M. M., Clark, C. R., & Patton, K. K. (2014). Socioeconomic determinants of cardiovascular disease: Recent findings and future directions. *Current Epidemiology Reports, 1*(2), 89–97. https://doi.org/10.1007/s40471-014-0010-8

Graça, J., Calheiros, M. M., & Oliveira, A. (2015). Attached to meat? (Un)willingness and intentions to adopt a more plant-based diet. *Appetite,* 95, 113–125. https://doi.org/10.1016/j.appet.2015.06.024

Grimshaw, K. E. (2013). *Consumer perception of beef, pork, lamb, chicken, and fish* [Master's thesis, Texas A&M University]. Texas Digital Library. https://tdl-ir.tdl.org/items/6cebbfb3-7257-4101-8d33-1ebdf2e9a1f8

Hmielowski, J. D., Feldman, L., Myers, T. A., Leiserowitz, A., & Maibach, E. (2014). An attack on science? Media use, trust in scientists, and perceptions of global warming. *Public Understanding of Science*, *23*(7), 866-883. https://doi.org/10.1177/0963662513480091

Hunninghake, D. B., Maki, K. C., Kwiterovich, P. O., Jr., Davidson, M. H., Dicklin, M. R., & Kafonek, S. D. (2000). Incorporation of lean red meat into a National Cholesterol Education Program Step I diet: A long-term, randomized clinical trial in free-living persons with hypercholesterolemia. *Journal of the American College of Nutrition, 19*(3), 351–360. https://doi.org/10.1080/07315724.2000.10718931

Hwang, Y., & Jeong, S.-H. (2009). Revisiting the knowledge gap hypothesis: A meta-analysis of thirty-five years of research. *Journalism & Mass Communication Quarterly, 86*(3), 513–532. https://doi.org/10.1177/107769900908600304

Ioannidou, M., Lesk, V., Stewart-Knox, B., & Francis, K. B. (2023). Moral emotions and justifying beliefs about meat, fish, dairy and egg consumption: A comparative study of dietary groups. *Appetite*, *186*, 106544. https://doi.org/10.1016/j.appet.2023.106544

Kahlor, L., & Rosenthal, S. (2009). If we seek, do we learn? Predicting knowledge of global warming. *Science Communication, 30*(3), 380–414. https://doi.org/10.1177/1075547008328798

Kashyap, P., Suter, J. F., & McKee, S. C. (2024). Measuring changes in pork demand, welfare effects, and the role of information sources in the event of an African swine fever outbreak in the United States. *Food Policy, 126,* Article 102672. https://doi.org/10.1016/j.foodpol.2024.102672

Khanal, B., & Dhoubhadel, S. P. (2023). The drivers of U.S. meat goat prices: A hedonic analysis of goat auction data. *Journal of Agricultural and Applied Economics, 55*(4), 730–747. https://doi.org/10.1017/aae.2023.37

Kim, Y., & Chen, H. T. (2023). Smartphone use and knowledge gap hypothesis: The relationship between mobile news consumption, discussion network heterogeneity, and political knowledge. *Information Technology & People, 36*(7), 2756–2773. https://doi.org/10.1108/ITP-07-2021-0545

Kristiansen, S., Painter, J., & Shea, M. (2021). Animal agriculture and climate change in the US and UK elite media: Volume, responsibilities, causes and solutions. *Environmental Communication, 15*(2), 153–172. https://doi.org/10.1080/17524032.2020.1805344

Kunda, Z. (1990). The case for motivated reasoning. *Psychological Bulletin, 108*(3), 480–498. https://doi.org/10.1037/0033-2909.108.3.480

Kwak, N. (1999). Revisiting the knowledge gap hypothesis: Education, motivation, and media use. *Communication Research, 26*(4), 385–413. https://doi.org/10.1177/009365099026004002

Larsson, S. C., & Orsini, N. (2014). Red meat and processed meat consumption and all-cause mortality: A meta-analysis. *American Journal of Epidemiology, 179*(3), 282–289. https://doi.org/10.1093/aje/kwt261

Le, T. T.-H., Langley, S. J., Dunham, J. G., Dang-Xuan, S., Unger, F., Ngo, H. H. T., Nguyen-Thanh, L., Nguyen-Viet, H., & Toribio, J.-A. (2022). Food safety knowledge, needed and trusted information of pork consumers in different retail types in Northern Vietnam. *Frontiers in Sustainable Food Systems, 6*, Article 1063927. https://doi.org/10.3389/fsufs.2022.1063927

Libera, J., Iłowiecka, K., & Stasiak, D. (2021). Consumption of processed red meat and its impact on human health: A review. *International Journal of Food Science & Technology, 56*(12), 6115–6123. https://doi.org/10.1111/ijfs.15270

Lind, F., & Boomgaarden, H. G. (2019). What we do and don't know: A meta-analysis of the knowledge gap hypothesis. *Annals of the International Communication Association, 43*(3), 210–224. https://doi.org/10.1080/23808985.2019.1614475

Lindgren, E., Damstra, A., Strömbäck, J., Tsfati, Y., Vliegenthart, R., & Boomgaarden, H. (2022). Uninformed or misinformed? A review of the conceptual–operational gap between (lack of) knowledge and (mis)perceptions. In J. Strömbäck, Å. Wikforss, K. Glüer, T. Lindholm, & H. Oscarsson (Eds.), *Knowledge resistance in high-choice information environments* (pp. 187–206). Routledge. https://doi.org/10.4324/9781003111474-10

Liu, J., Chriki, S., Kombolo, M., Santinello, M., Pflanzer, S. B., Hocquette, É., Ellies-Oury, M.-P., & Hocquette, J.-F. (2023). Consumer perception of the challenges facing livestock production and meat consumption. *Meat Science, 200*, Article 109144. https://doi.org/10.1016/j.meatsci.2023.109144

Loughnan, S., Bastian, B., & Haslam, N. (2014). The psychology of eating animals. *Current Directions in Psychological Science, 23*(2), 104–108.https://doi.org/10.1177/0963721414525781

Mafruchati, M. (2020). Beef, pork, or lamb? Comparative study between 3 kinds of red meat consumption in the USA toward the number of COVID cases. *Systematic Reviews in Pharmacy, 11*(9), 808–812. https://www.sysrevpharm.org/abstract/beef-pork-or-lamb-comparative-study-between-3-kinds-of-red-meat-consumption-in-the-usa-toward-the-number-of-covid-cases-65938.html

Miller, R. (2020). Drivers of consumer liking for beef, pork, and lamb: A review. *Foods, 9*(4), Article 428. https://doi.org/10.3390/foods9040428

Moore, D. W. (1987). Political campaigns and the knowledge-gap hypothesis. *Public Opinion Quarterly, 51*(2), 186–200. https://doi.org/10.1086/269028

Murray, R., Glass-Kaastra, S., Gardhouse, C., Marshall, B., Ciampa, N., Franklin, K., Hurst, M., Thomas, M. K., & Nesbitt, A. (2017). Canadian consumer food safety practices and knowledge: Foodbook study. *Journal of Food Protection, 80*(10), 1711–1718. https://doi.org/10.4315/0362-028X.JFP-17-108

Nickerson, R. S. (1998). Confirmation bias: A ubiquitous phenomenon in many guises. *Review of General Psychology, 2*(2), 175–220. https://doi.org/10.1037/1089-2680.2.2.175

Northstone, K., Emmett, P., & the ALSPAC Study Team. (2005). Multivariate analysis of diet in children at four and seven years of age and associations with socio-demographic characteristics. *European Journal of Clinical Nutrition, 59*(6), 751–760. https://doi.org/10.1038/sj.ejcn.1602136

Nyhan, B. (2020). Facts and myths about misperceptions. *Journal of Economic Perspectives, 34*(3), 220–236. https://doi.org/10.1257/jep.34.3.220

Pampel, F. C., Denney, J. T., & Krueger, P. M. (2012). Obesity, SES, and economic development: A test of the reversal hypothesis. *Social Science & Medicine, 74*(7), 1073–1081. https://doi.org/10.1016/j.socscimed.2011.12.028

Peden, R. S., Camerlink, I., Boyle, L. A., Loughnan, S., Akaichi, F., & Turner, S. P. (2020). Belief in pigs' capacity to suffer: An assessment of pig farmers, veterinarians, students, and citizens. *Anthrozoös, 33*(1), 21–36. https://doi.org/10.1080/08927936.2020.1694304

Penkert, L. P., Li, R., Huang, J., Gurcan, A., Chung, M. C., & Wallace, T. C. (2021). Pork consumption and its relationship to human nutrition and health: A scoping review. *Meat and Muscle Biology, 5*(1), Article 43, 1–22. https://doi.org/10.22175/mmb.12953

Petrie, C. (2019). *Live export: A chronology* (Research Paper Series 2019–20). Law and Bills Digest Section, Parliament of Australia.

Piksa, M., Noworyta, K., Gundersen, A., Kunst, J., Morzy, M., Piasecki, J., & Rygula, R. (2024). The impact of confirmation bias awareness on mitigating susceptibility to misinformation. *Frontiers in Public Health, 12*, Article 1414864. https://doi.org/10.3389/fpubh.2024.1414864

Pinchen, H., Church, S., Strong, M., Dimmack, L., Powell, N., Swan, G., & Finglas, P. M. (2020). Nutrient content of key cuts of pork in the UK. *Nutrition Bulletin, 45*(2), 165–174. https://doi.org/10.1111/nbu.12432

Qu, S., Bradley, T., & Rumble, J. N. (2018). Identifying a knowledge gap of blueberry health benefits: The role of education, income, generation and gender. *Journal of Southern Agricultural Education Research, 68*(1), 4-23. https://dr.lib.iastate.edu/entities/publication/0afd34e4-88c6-4922-ab3d-bbde86fefe51

Rice, M., Hemsworth, L. M., Hemsworth, P. H., & Coleman, G. J. (2020). The impact of a negative media event on public attitudes towards animal welfare in the red meat industry. *Animals, 10*(4), Article 619. https://doi.org/10.3390/ani10040619

Roesel, K., Ejobi, F., Dione, M., Pezo, D., Ouma, E., Kungu, J., Clausen, P.-H., & Grace, D. (2019). Knowledge, attitudes and practices of pork consumers in Uganda. *Global Food Security, 20,* 26–36. https://doi.org/10.1016/j.gfs.2018.12.001

Ruby, M. B. (2012). Vegetarianism: A blossoming field of study. *Appetite, 58*(1), 141–150. https://doi.org/10.1016/j.appet.2011.09.019

Rumble, J. N., & Buck, E. B. (2013). Narrowing the farm-to-plate knowledge gap through semiotics and the study of consumer responses regarding livestock images. *Journal of Applied Communications, 97*(3), 57–75. https://doi.org/10.4148/1051-0834.1117

Salmon, C. T., Wooten, K., Gentry, E., Cole, G. E., & Kroger, F. (1996). AIDS knowledge gaps: Results from the first decade of the epidemic and implications for future public information efforts. *Journal of Health Communication: International Perspectives, 1*(2), 141–156. https://doi.org/10.1080/108107396128112

Scheufele, D. A., & Krause, N. M. (2019). Science audiences, misinformation, and fake news. *Proceedings of the National Academy of Sciences, 116*(16), 7662–7669. https://doi.org/10.1073/pnas.1805871115

Sharma, P. R., Wade, K., & Jobson, L. (2022). A systematic review of the relationship between emotion and susceptibility to misinformation. *Memory, 31*, 1-21. https://doi.org/10.1080/09658211.2022.2120623

Simis, M. J., Madden, H., Cacciatore, M. A., & Yeo, S. K. (2016). The lure of rationality: Why does the deficit model persist in science communication? *Public understanding of science*, *25*(4), 400-414. https://doi.org/10.1177/0963662516629749

Sinclair, M., Derkley, T., Fryer, C., & Phillips, C. J. C. (2018). Australian public opinions regarding the live export trade before and after an animal welfare media exposé. *Animals, 8*(7), Article 106. https://doi.org/10.3390/ani8070106

Smith, M. L., Jung, J., Olynk Widmar, N., Ufer, D. J., Berikou, M., & Lusk, J. (2025). Quantifying interest in and sentiment of online media about greenhouse gas emissions from cattle production in the United States. *Translational Animal Science, 9*, Article txaf105. https://doi.org/10.1093/tas/txaf105

Steede, G. M., Meyers, C., Li, N., Irlbeck, E., & Gearhart, S. (2020). The influence of framing effects on public opinion of antibiotic use in livestock. *Journal of Applied Communications, 104*(2), Article 3. https://doi.org/10.4148/1051-0834.2291

Stewart, J. W., Kaplan, M. L., & Beitz, D. C. (2001). Pork with a high content of polyunsaturated fatty acids lowers LDL cholesterol in women. *The American Journal of Clinical Nutrition, 74*(2), 179–187. https://doi.org/10.1093/ajcn/74.2.179

Taber, C. S., & Lodge, M. (2006). Motivated skepticism in the evaluation of political beliefs. *American Journal of Political Science, 50*(3), 755–769. https://doi.org/10.1111/j.1540-5907.2006.00214.x

Teixeira, A., & Rodrigues, S. (2021). Consumer perceptions towards healthier meat products. *Current Opinion in Food Science, 38,* 147–154. https://doi.org/10.1016/j.cofs.2020.12.004

Tichenor, P. J., Donohue, G. A., & Olien, C. N. (1970). Mass media flow and differential growth in knowledge. *Public Opinion Quarterly, 34*(2), 159–170. https://doi.org/10.1086/267786

Tiplady, C. M., Walsh, D.-A. B., & Phillips, C. J. C. (2013). Public response to media coverage of animal cruelty. *Journal of Agricultural and Environmental Ethics, 26*(4), 869–885. https://doi.org/10.1007/s10806-012-9412-0

Tønnesen, M. T., & Grunert, K. G. (2021). Social-psychological determinants of young consumers' consumption of pork. *Food Quality and Preference, 93,* Article 104262. https://doi.org/10.1016/j.foodqual.2021.104262

Tonsor, G. T., & Olynk, N. J. (2011). Impacts of animal well-being and welfare media on meat demand. *Journal of Agricultural Economics, 62*(1), 59–72. https://doi.org/10.1111/j.1477-9552.2010.00266.x

U.S. Department of Agriculture Foreign Agricultural Service. (2023). *Livestock and poultry: World markets and trade.* (Global Market Analysis Report). https://downloads.usda.library.cornell.edu/usda-esmis/files/73666448x/zs25zt652/6395xr88c/livestock_poultry.pdf

U.S. Food and Drug Administration. (2024, October 24). *Steroid hormone implants used for growth in food-producing animals.* https://www.fda.gov/animal-veterinary/product-safety-information/steroid-hormone-implants-used-growth-food-producing-animals

Variyam, J. N., Blaylock, J., Lin, B.-H., Ralston, K., & Smallwood, D. (1999). Mother's nutrition knowledge and children's dietary intakes. *American Journal of Agricultural Economics, 81*(2), 373–384. https://doi.org/10.2307/1244588

Verbeke, W., & Liu, R. (2014). The impacts of information about the risks and benefits of pork consumption on Chinese consumers' perceptions towards, and intention to eat, pork. *Meat Science, 98*(4), 766–772. https://doi.org/10.1016/j.meatsci.2014.07.023

Verbeke, W., Pérez-Cueto, F. J. A., de Barcellos, M. D., Krystallis, A., & Grunert, K. G. (2010). European citizen and consumer attitudes and preferences regarding beef and pork. *Meat Science, 84*(2), 284–292. https://doi.org/10.1016/j.meatsci.2009.05.001

Vicente, F., & Pereira, P. C. (2024). Pork meat composition and health: A review of the evidence. *Foods, 13*(12), Article 1905. https://doi.org/10.3390/foods13121905

Vida, V., & Szűcs, I. (2020). Pork production and consumption issues from the perspective of the religion and the world's growing population. *Applied Studies in Agribusiness and Commerce, 14*(1–2), 121–128. https://doi.org/10.19041/apstract/2020/1-2/16

Vilela, S., Mureșan, I., Correia, D., Severo, M., & Lopes, C. (2020). The role of socio-economic factors in food consumption of Portuguese children and adolescents: Results from the National Food, Nutrition and Physical Activity Survey 2015–2016. *British Journal of Nutrition, 124*(6), 591–601. https://doi.org/10.1017/S0007114520001373

Viswanath, K., Finnegan, J. R., Hannan, P. J., & Luepker, R. V. (1991). Health and knowledge gaps: Some lessons from the Minnesota Heart Health Program. *American Behavioral Scientist, 34*(6), 712–726. https://doi.org/10.1177/0002764291034006008

Viswanath, K., Kahn, E., Finnegan, J. R., Hertog, J., & Potter, J. D. (1993). Motivation and the knowledge gap: Effects of a campaign to reduce diet-related cancer risk. *Communication Research, 20*(4), 546–563. https://doi.org/10.1177/009365093020004003

Wardle, J., Parmenter, K., & Waller, J. (2000). Nutrition knowledge and food intake. *Appetite, 34*(3), 269–275. https://doi.org/10.1006/appe.1999.0311

Wardle, C., & Derakhshan, H. (2017). *Information disorder: Toward an interdisciplinary framework for research and policymaking*. Council of Europe. https://www.coe.int/en/web/freedom-expression/information-disorder

Weeks, B. E. (2015). Emotions, partisanship, and misperceptions: How anger and anxiety moderate the effect of partisan bias on susceptibility to political misinformation. *Journal of Communication, 65*(4), 699–719. https://doi.org/10.1111/jcom.12164

West, J. D., & Bergstrom, C. T. (2021). Misinformation in and about science. *Proceedings of the National Academy of Sciences*, *118*(15), Article e1912444117. https://doi.org/10.1073/pnas.1912444117

Winkleby, M. A., Jatulis, D. E., Frank, E., & Fortmann, S. P. (1992). Socioeconomic status and health: How education, income, and occupation contribute to risk factors for cardiovascular disease. *American Journal of Public Health, 82*(6), 816–820. https://doi.org/10.2105/AJPH.82.6.816

Yang, R., Raper, K. C., & Lusk, J. L. (2020). Impact of hormone use perceptions on consumer meat preferences. *Journal of Agricultural and Resource Economics, 45*(1), 107–123. https://www.jstor.org/stable/10.2307/26869029

Zhou, Y., Zhang, A., Dekker van Klinken, R., Jones, D., & Wang, J. (2025). Consumers' perspectives on antibiotic use and antibiotic resistance in food animals: A systematic review. *npj Science of Food, 9*, Article 29. https://doi.org/10.1038/s41538-025-00381-3