

**Assessing Informational Bias and Food Safety:
A Matrix Method Approach**

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Abstract

Imperfect information can lead to market failure and a reduction in public welfare. A matrix method approach to content analysis was conducted by independent judges based upon established typologies. Food safety articles from consumer publications, 1989 – 1997, were examined. Food safety information received by consumers was found to be biased.

As consumers have become more removed from the farm, they must look to the food industry to help them achieve healthier diets, universities and scientific agencies to evaluate the safety and benefits of those dietary changes, and the government to enforce and regulate food safety and consistency standards. In a majority of instances, information associated with this process is transmitted from those in the scientific and enforcement community to consumers through the media. Whether the message is “nutritionally improved,” “light,” “low fat,” “low sodium,” “packed in water,” “cholesterol free,” or “organic,” consumers receive a variety of messages in their efforts to consume a healthy diet. The consumption of meat items is no exception.

Consumers have become even more concerned about the safety of the U.S. meat supply, including pork, and the government’s ability to guarantee a consistently safe product (Heimbach). Well-publicized incidents, such as the contamination of hamburgers with E.coli bacteria, sulfa residues in pork, the pesticide Alar on apples, and salmonella growth in under-cooked pork, are widespread. Yet, conflicting media reports may leave consumers uninformed and confused.

Food safety information can be costly to gather and difficult to understand and relay to readers. Scientific studies are often complex, contradictory and open for interpretation. The public frequently relies on the media for information regarding their food purchases and consumption. The nation’s media agenda may not be strictly informational in nature because most media organizations are profit-seeking entities. As informational reliance on the media has grown, concerns over possible misinformation, or bias, toward food and agricultural commodities have also grown (Jones; Foster). As stated by Jones, “There is a tendency for consumer concerns about food safety issues, however, to be exaggerated by the popular press.”

Objectives

The objective of this study was to determine the incidence of informational bias regarding pork consumption in print media. The word “bias” is commonly used to imply media distortions and inaccuracies, misrepresentation of truth or fact, sensationalism, or faithful reflection of a dominant ideology. In journalistic circles this type of bias is referred to as “slant,” while public relations firms might call it “spin.” For the purpose of this research, bias was defined as “an intentional or unintentional misrepresentation or distortion of generally established truth or fact as depicted by inaccuracies, omission and/or impartiality reflecting the author’s subjective viewpoint as perceived by referees.”

This analysis is important because of the major role information plays in efficient market operations. Even under the assumption that consumers behave rationally, a lack of information, or misinformation regarding the safety of pork consumption will lead to market failure and a reduction in public welfare.

While many articles and previous research mention informational bias, few have empirically demonstrated the presence of media bias (Zipperer, Goode, Goidel and Langley, and

Raybon). Content analysis has been most commonly used to examine the content and influence of the media, but has not been extended to address bias specifically.

The Consumer's Information Environment

In a book by Michael Schudson, *Advertising: The Uneasy Persuasion*, concepts of information, advertising, and consumer and economic theory are brought together with the recognition that consumers do not associate decision making with a specific, singular process. Consumers operate in an "information environment" which recognizes that normal consumers have a lifetime of informational resources and a complex cognitive makeup which either increases, decreases or eliminates completely that individual's ability to receive and process information. This "experience filter," among other things, makes the study of consumer information and decision making more individualistic and more complex.

Consumers are surrounded by information that does not come openly from commercial sources and may not stem from commercial sources at all. Information in the media regarding a product may not be paid advertising. Some will be generated from commercial public relations firms, government reports, consumer groups, journalists, universities, and other noncommercial agencies.

The news media can provide a great deal of information when the subject becomes an issue of political or social interest - when it becomes "newsworthy." News organizations cover topics and products that make news. Food irradiation, micro-pathogen contaminated beef, beef patty recalls, and sulfa residues in pork become more newsworthy as consumers die, which increases air time or column space devoted to these topics.

The media also provides a critical, but less sensational role, in consumer information by informing consumers of new products and trends in consumption. It is doubtful that consumption of sushi, tofu, and similar products would exist without media coverage.

In addition to media sources, taxpayer funded consumer education programs provide consumer education to the public. School system curricula, including home economics and foods classes, provide information to millions of children and young adults annually. Recently, the National Pork Producers Council, Cattlemen's Beef Association, and National Livestock and Meats Board sponsored consumer education programs in conjunction with the U. S. Department of Agriculture in American junior and senior high schools. University research on such things as biotechnology, governmental studies, and legislative activities on food safety and nutritional labeling, and nonprofit consumer advocate groups all provide product and general information to the public.

Perceptions of advertising's role as an information source and in the market economy vary - from evil (Toynbee) to irreplaceable element of capitalism (Pember, p. 377). One thing is certain - advertising is big business. In 1994, food marketing firms spent nearly \$10 billion on direct consumer advertising. It can be assumed that some of this advertising was directed towards the introduction of the 15,006 new food products that were introduced in 1994 (Gallo).

Persuasive advertising is designed to shift consumer tastes and perceptions by explicitly or implicitly making claims that may or may not be related to tangible characteristics of the product, or product attributes. This style of advertising information is often contrasted with informational advertising which describes a product's features (new pork sandwich available at McDonald's for a limited time only). While persuasive advertising is usually referred to in a much more negative manner relative to informational advertising, the goal of both advertising styles is the same, to increase profits. Ideally, the firm seeks to increase brand loyalty so that the product is fully differentiated from competitive products. The firm will then face a less elastic demand curve allowing it to raise the product price and earn even greater profits. It is this "greedy" vision of advertising that has been called "evil".

Information is costly to obtain, whether in dollar terms or in terms of time spent collecting it. In the decision making process, it is seldom convenient nor possible to gather all relevant information prior to the decision or purchase being made. In addition, the search for information delays purchase of the needed item which can negatively impact the utility derived from the good. Given our understanding of the information environment at this point, the benefits gained from new information may be marginal and simply not worth the effort. This disinclination to seek out information should not be dismissed as evidence of irrational behavior on the part of consumers even though it results in imperfect knowledge of prices and qualities. Gathering and processing information adds substantially to the total cost of the purchase (Chaffee and McLeod).

At any one time, a given level of information exists that is readily available to the average consumer. Yet, the consumer fails to utilize all of the information at his or her disposal in the decision making process. Again, this disinclination to seek out information should not be dismissed as evidence of irrational behavior on the part of consumers. According to Carlton and Perloff (pp. 556-57), it is often efficient for consumers to use simplified rules to process information. They rationally use only some of the information they have collected because it is too costly to process it. While a consumer may have the ability to calculate price per ounce or per gram at the grocery store, they probably don't consistently because they want to get out of the store and on with their lives. Consumers in this case are making a rational decision not to use all of the information at their disposal because they value their time, or what they can do with the time, more than they value the extra financial savings.

In addition, some consumers do not have sufficient education or intelligence to process available information. Complex issues such as scientific research or statistical analysis of political campaigns and probabilities of success may be outside the scope of some consumers (and those reporting on these topics to the public also).

Methodology

Quantitative measures, including content analysis and survey research, provide evidence of the kinds of information various publics are being exposed to (Newsom, Scott and Turk). Previous research by Smith and Bloom; Hayes; Maynes and Assum; Haefner and Permut; and

Burton and Andrews, utilized content analysis, primarily as a tool to evaluate the mass media's reliability or adequacy as a source of consumer information.

As employed by Carlson, Grove, and Kangun, a matrix method approach to content analysis was utilized to test the hypothesis that the print media provides an impartial or unbiased representation of the safety of meat (pork) consumption to consumers. Specific attention was devoted to the criteria of sampling method (unbiased sample selection), systematization (utilizing a data collection or evaluative design that describes identifiable characteristics), objectivity (providing rules, training, and insuring independence of assessments) and reliability (trustworthiness of assessments) in order to ensure the highest quality of content analysis research (Kassarjian).

To generate a sample of print publications, InfoTrac SearchBank was used to access magazine and newspaper articles from over 400 general interest titles from 1989 through 1997. In light of previous research in this area, total sampling was employed rather than limited sampling. A variety of keyword searches was used to maximize the number of citations available. While it would be extremely difficult to find all possible citations cataloged on InfoTrac, these searches provided a sufficient number of articles to analyze. Those articles not meeting the established research criteria that (1) articles pertain to the health and safety of pork consumption and (2) articles be available in their entirety (no abstracts or brief citations) were eliminated. To ensure consistency, the investigator acted as sole referee in determining if the above criteria were met.

To establish systematization, two typologies were developed to investigate the interaction between the presence of bias (positive, neutral and negative) and Parenti's methods of media manipulation. Parenti defined the six methods of media manipulation or bias as Suppression by Omission, Labeling, Attack and Destroy Target, False Balancing, Face-Value Transmission, and Framing. Each article was evaluated by three judges based upon the established typologies. While each article may have numerous incidence of bias, each article was scored, overall, as being positively biased, negatively biased or unbiased, based upon the overall average incidence of bias. In other words, incidence of negative bias offsets incidence of positive bias, so that the net bias is determined. Each positive incidence equal plus-one, each negative incidence equals negative-one, while unbiased incidences equal zero. Both individual and overall bias scores, from each judge, were summed and evaluated. Therefore, the number of biased incidence may exceed the overall number of articles studied, but the overall number of articles found to be biased (either positive or negative) or unbiased equaled the number of articles evaluated per judge. To provide a stronger test of bias, and less ambiguity, the final decision on article bias must be made unanimously; all of the three judges must find the article to be negatively biased in order for the article to be labeled negatively biased.

Efforts to establish objectivity were made through providing rules and procedures to the judges and insuring independence among their assessments. Three judges were used to classify the articles according to the specified criteria. The judges were all faculty at the same community college, each having a minimum of a Master's degree and four years teaching experience. The judges were instructors in the fields of computer science, literature and

language, and business administration. As noted by Carlson, Grove, and Kangun, the participation of these individuals can be more expected to reflect the views of the general consumer population than judges with extensive scientific backgrounds. Each of the judges were given written and verbal instructions as to the typologies and study in general. Each judge was given a packet consisting of the articles, each identified by number, evaluation grids, one per article, and a deadline for completion of their evaluations. Upon completion, the packets were returned for tabulation and summation.

Inferences of bias that were unable to be classified under both typologies were disqualified, and the article was removed from further evaluation. Finally, reliability among judges' assessments was calculated using an interjudge reliability coefficient (Perreault and Leigh; Carlson, Grove, and Kangun; Kolbe and Burnett).

Results

The InfoTrac search produced 114 articles relating to pork consumption and food safety between 1989 and 1997. Forty-nine articles were eliminated because they failed to meet the established criteria, mainly that the entire article be available. The remaining 65 articles were evaluated by the judges. Four were determined to be inappropriate and eleven were eliminated because a consensus of bias could not be reached. Three articles were declared positively biased, 16 were declared negatively biased, and the remaining 31 articles were deemed unbiased by the panel of judges.

The reliability among judges' assessments was calculated using an interjudge reliability coefficient by dividing the number of coding agreements by the total number of coding decisions (Perreault and Leigh; Carlson, Grove, and Kangun; Kolbe and Burnett). Overall reliability for all coding decisions was 0.82, which is above the acceptable 0.80 coefficient value recommended by Kassarian. The calculated reliability coefficient is understated because all judges decisions in this research required unanimous agreement, as opposed to a simple majority, making the decision process more stringent. Because it was more difficult to get unanimous agreement, the number of coding agreements was lower than it might have been had only a majority (2:1) been required, lowering the value of the reliability coefficient.

A chi-square Goodness-of-Fit Test was used to test whether there was a statistical difference between those articles judged to be biased and those judged to be unbiased. For the test of hypothesis, the expected probability of no bias was set equal to 0.05 and the expected probability of a biased response was set at 0.95. For this test of hypothesis, 19 articles were judged to be biased and 31 articles were judged to be unbiased. Fifty total articles were judged. The null hypothesis of no media bias was rejected at the 5 percent level of significance.

Conclusions

American consumers arguably face the most abundant and varied supply of safe, nutritious foods in the world. Diet related health problems like heart disease, cancer, stroke and diabetes accounted for nearly 1.3 million deaths in 1993. It is estimated that these and other diet-related health conditions cost society \$250 billion each year in medical costs and lost productivity. Consumers are advised by the scientific and health communities to eat more fresh fruits and vegetables, and higher fiber, and to reduce consumption of saturated fats for a more heart-healthy diet. However, consumers are overwhelmed by warnings from consumer protection organizations, industry advertising, the government and the media, and from conflicting scientific studies that increasing of these same foods may be unsafe. Over the period of this study, 1989 to 1997, consumers have received conflicting information with which to make their purchasing and consumption decisions.

If concerns reported in surveys are related to actual states of concern, surveys on consumer concerns may reveal consumer alertness to information on exposure to harmful additives. If this hypothesis were true, changes in attention to information on exposure might result in different food purchase. Studies provide some limited behavioral evidence that changes in information on exposure or uncertainty of food risks do change food purchases. However, safety is not a good that consumers can go to the supermarket to buy, thus revealing how much they want of it at different prices. Rather, safety is a characteristic of the goods and services they buy, and it is a characteristic that is extremely costly, and in some cases impossible to access. It is precisely this information problem that creates confusion and mistrust in U.S. consumers.

Previous research has approached the existence of a failure in the market for food safety attributes as a justification for food safety regulation. This research addresses market failure from the standpoint of the degree in which unbiased information is relayed through the media from senders to receivers or consumers. An evaluation of nine years worth of consumer accessible newspaper and magazine articles concluded that information received by consumers is biased, both positively and negatively. Therefore, the solution to market failures due to imperfect information is not limited to increasing the amount or accessibility of food safety information, but also to reducing the degree of bias with which the information is provided to consumers.

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