



Consumers Response to Meat Traceability: The Influence of Marketing Mix Variables

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Abstract

This study employed a conjoint analytic method to explore the influence of traceability systems that may impact on consumers' buying decision on meat and meat-processed food, with four independent factors: types of meat, the presence vs. the absence of traceability systems, prices, and distribution channels. A survey was conducted with 114 consumers in Khonkaen. Drawn from study results, traceability systems were identified to be the most influential factor that determines consumers' buying interest, followed by prices, and distribution channels, while types of meat (fresh meat vs. processed-meat products) did not have a significant, direct impact on consumers' buying interest. However, types of meat, when interacting with the presence/absence of traceability systems, significantly impacted on consumers' buying interest. Such a finding is beneficial for implementing the concept of marketing mix and devising a marketing strategy for meat products.

Keywords : meat traceability, marketing mix, conjoint analysis

1. Introduction

Food quality and food safety have become an integral part in consumer awareness and consumer decision upon buying food (Grunert, 2005), particularly for meat and meat-processed products. This is because consumers are often threatened by pathogenic bacteria contained in such products. Global awareness on meat quality and meat safety is gradually increasing after consumers had experience with mad cow disease in Europe (Bovine Spongiform Encephalopathy: BSE) and outbreaks of H5N1 bird flu in poultry in Asia (Burgos and Burgos, 2007; Sans, de Fontguyon and Giraud, 2008).

Consumer responses for reducing risks derived from meat consumption in any unusual incident have resulted in a more attention to the consumption of meat-related products. For example, consumers make a buying decision based on well-recognized brands which provide a quality assurance mark, while attempting to avoid low-priced chicken in order to ensure that they obtain chicken without bacteria and E.COLI contamination (Yeung and Morris, 2001). Another consumer response also includes their confidence in meat-related products with a label detailing the manufacturing process throughout the food chain.

Importantly, both government and food manufacturing sectors have pushed forward policies and measures in order to protect the reputation of meat industry and to retain consumer confidence (Pouliot and Sumner, 2007). This is because outbreaks in cattle have caused a negative attitude among consumers, reducing the volume of meat consumption and adversely affecting the whole meat manufacturing industry (Choe et al., 2009). As a result, European countries have strictly imposed serious traceability systems for meat production, enabling consumers to have information on cattle farms, or the meat origin, from breeding to meat processing towards the market. This makes for a starting point to create standards

and safety of meat at an international level.

While an increase in quality and safety as a result of traceability systems has caused unusually high prices of meat, some consumers in China and the US were found willing to pay at a higher rate for meat products with traceability systems as the systems guarantee that they are safe from bacteria or BSE contaminated meat (Zhao, Qiao and Chen, 2010; Dickinson and Bailey, 2002).

An interesting case of the influence of traceability systems of meat products on consumer attitude also took place in Taiwan, where problems were triggered by the use leanness-enhancing agent in pork (Lo, Chang and Chang, 2011). This incident adversely impacted confidence among pork consumers, causing so sharp a decline in pork consumption nationwide that the Taiwanese government had to strictly imposed traceability systems for meat production. With traceability systems in use, consumers have gradually developed a better attitude and behavior towards meat consumption.

Likewise, bird flu situations in Thailand that have occurred since 2004 make consumers panicked so much that chicken and poultry consumption considerably dropped (Burgos and Burgos, 2007). The Thai government had to step in by creating safety and standard measures in meat production to boost the poultry industry. Campaigns under the safe meat program were initiated in order to promote consumers to buy meat and meat-processed products with a "Q" mark, provided by Department of Livestock Development, denoting a quality assurance starting from meat production process at cattle farms through the consumers (Piemkhoontham and Ruenrom, 2010). As for meat producers, leading Thai companies which operate a comprehensive meat business have developed traceability systems to standardize quality and safety of their meat production, while utilizing the systems as marketing strategy in order to create an edge in branding. This is a good response to highly competitive markets both in Thailand and overseas (Department of Industry

Promotion, Thailand, 2009).

The use of traceability systems as a marketing tool to boost consumers' buying decision, however, is flawed in terms of consumer awareness. As indicated by Piemkhontham and Ruenrom (2010), approximately 69% of consumers were reportedly unaware of the fact that traceability systems have been in use in Thailand and only 14% had experience with making use of traceability systems in supermarkets. Thai consumers' limited awareness about traceability systems is probably caused by obstacles in terms of distributing channels because producers often place their products in supermarkets within department stores and meat specialty stores. In addition, high prices of meat with traceability systems lead to a limited range of potential customers. Even though most Thai consumers have limited knowledge and/or experience on traceability systems, the literature review suggested that consumers tend to accept meat products with traceability systems and are willing to pay slightly higher for pork and chicken with these systems. In other words, traceability systems could offer a key marketing tool to boost confidence and a positive attitude among consumers; thereby resulting in their buying decision.

The current research is thus aimed at investigating the importance of traceability systems that may determine consumers' buying decision on meat and meat-processed products, in comparison with other marketing tools, in order to identify an appropriate application of traceability systems for marketing meat products.

2. Literature Review

Food products, especially fresh meat, are typical consumer goods with no much difference (Grunert, Bredahl and Brunso, 2004). Yet, in an attempt to survive in increasingly fierce competition, producers are seeking marketing strategies that can differentiate their products from those produced by rival firms e.g. proper branding,

taste development, and manufacturing process. Such strategies can lead to brand success, a larger market share, and a competitive advantage in the price war (Thilmany, Umberger and Ziehl, 2006).

Consumers' decision on buying meat is based on numerous factors. Mangaraj and Senauer (2001) elaborated consumers' buying behaviors at supermarkets that some of them do shopping based on price and value, while the more sophisticated consumers tend to purchase on the basis of quality and safety concerns. Other customers often choose products for any convenient location. This observation is in agreement with Baker and Burnham (2001) that customers' buying decision is based on quality and reasonable prices.

A number of studies on the market of meat-related products indicated that producers have made use of traceability systems as strategy to distinguish their products from those produced by competitors (Hobbs et al., 2005). An advantage of traceability systems is an ability to trace back to cattle farms, or the meat origin, breeding and manufacturing processes (Alfaro and Rabade, 2009). Even though traceability systems could offer a mechanism in creating quality and safety standards for products in accordance with the rules and legislation of European Union (EU), the ultimate goal of traceability systems for marketing is to gain consumer confidence in products; thereby leading to a purchase (Thilmany, Umberger and Ziehl, 2006).

Risk and safety awareness are associated with consumers' buying interest in meat products. As pointed out by Dodds, Monroe, and Grewal (1991) and Grewal et al. (1998), consumers often assess a product value on the basis of information contained in product labels. The more information and worthiness of products are provided by product owners, the higher buying interest will be developed by consumers. This is confirmed by studies of Rijswijk and Frewer (2008) and Kehagia et al. (2007), who advocated that customers tend to be interested in

meat and products with traceability systems because they expect and acknowledge meat quality and meat safety, resulting in their confidence in consuming meat with such assurance systems. Likewise, as observed by Lo, Chang and Chang (2011); and Choe et al. (2009), traceability systems positively affect the relationship between products and consumer confidence, help reduce concerns about possible risks from meat consumption, and make consumers more willing to buy at a higher price.

However, other studies discovered that price is negatively related to consumers' buying interest. As Zhao, Qiao and Chen (2010) put, in terms of willingness to pay, even though customers are very much interested in meat with traceability systems, they still want to pay at the same rate as they do for usual meat and are of an opinion that meat with traceability systems are too expensive and thus less attractive to buy.

Considering different types of meat e.g. fresh meat and meat-processed products, most of the literature seem to focus on awareness of risks involved in fresh meat, rather than meat-processed products. Such studies indicated that consumers, when buying fresh meat, make their choice on the basis of their previous experience (Grunert, Bredahl and Brunso, 2004). At first, they pay attention to such meat characteristics as color, smell, freshness and size. Next, there is a higher level of meat selection, in the case of consumers who are concerned about meat safety and want to prevent themselves from unsafe fresh meat, which is based on consideration of a label informing the meat origin (Becker, Benner, and Glitsch, 2000). Such traceability information can be also utilized by marketers in order to foster confidence in the safety of fresh meat (Verbeke and Vackier, 2004).

As for meat-processed products such as sausages and hams, consumers are often concerned about risks caused by bacteria contamination. Therefore, they tend to choose products with a label certifying that the products have been through such bacteria killing process as radiation

(Cabeza et al., 2009). Some consumers also consider packaging characteristics by choosing vacuum packages which can protect bacterial growth (Resurreccion, 2003). In addition, products with a label certifying EU standards such as Protected Designations of Origin (PDO), including meat producers' reputation, can create a positive attitude towards meat-processed products among customers (Resano, Sanjuan and Albisu, 2007).

Distribution channel could be an antecedent of consumer confidence in meat quality. As observed by Giraud and Amblard (2003, cited in Sans, de Fontguyon and Giraud, 2008), meat buyers at supermarkets make for a segment that pays more attention to traceability systems, in comparison with other consumer groups. On the other hand, there are general consumers who buy at any meat store and thus focus more on confidence, derived from sellers' behaviors, rather than traceability systems. Meanwhile, Thilmany, Umberger and Ziehl (2006) argued that even though consumers have a variety of shopping channels, those who do care for meat quality and meat safety are likely to buy through an alternative marketing channel (that is, not supermarket), for instance, purchasing online with cattle farms.

The aforementioned variables that may determine meat and meat-processed product consumption, therefore, lead to the present research aim, that is, to study the outcomes of traceability systems as determinant of consumers' buying decision on meat and meat-processed food, compared to other marketing tools: product; price; and place. Research results are expectedly beneficial for marketers so that they can gain some insights into the actual interest of consumers, resulting in more effective marketing plans.

Based on the literature discussed thus far, the following research hypotheses are proposed:

H1: Types of meat-related food influence consumers' buying interest.

H2: Meat traceability systems influence consumers' buying interest.

H3: Retail prices of meat influence consumers' buying interest.

H4: Distribution channels of meat influence consumers' buying interest.

3. Methodology

3.1 Instrument

The present study employed a conjoint analysis which attempts to explain product characteristics which influence customers' demands. This method could lead to a better understanding of customer satisfaction with numerous product characteristics and thus are useful for developing market offerings in accordance with customer needs (Hauser and Rao, 2002). In doing so, this research specified four independent variables: (1) types of meat (fresh meat; and meat-processed products) (2) traceability systems (the presence of traceability systems; and the absence of traceability systems) (3) prices (regular price; 10% increase in price; and 20% increase in price) and lastly (4) distribution channels (fresh markets; meat specialty stores; and supermarkets).

Out of these four independent variables, the first and second were divided into two attribute levels while the third and fourth into three attribute levels. Based on this design, a full factorial design of $2 \times 2 \times 3 \times 3 = 36$ scenarios in total were realized. Each scenario could measure consumers' buying interest in each buying situation where the four independent variables vary. Choices of answer were measured in a 5-point Likert scale ranging from 1 = not interesting to buy at all to 5 = very interesting to buy.

A series of regression and ANOVA analyses were conducted to test the hypothesized relationships between these independent variables and dependent one, that is, consumers' interest in buying meat.

3.2 Sample

Traditional conjoint analytic method has no sample size requirements and could be utilized even for a single respondent (Hair et al., 1998). Green and Srinivasan (1978), however, suggested a minimum sample of 100 respondents to provide reliable estimates. The sample size of some previous conjoint analytic studies were 125 respondents (Charles, Kumar and Anand, 2011) and 120 respondents (Buppapun and Thunyapornsakol, 2011). As a consequence, it appears that a study with a minimum sample size of 100 appears to be acceptable in the literature.

Our research was conducted with 114 consumers in Khonkaen via purposive sampling technique. Each consumer was instructed to respond to questions in six scenarios, resulting in six different versions of questionnaires for the whole sample.

4. Results

The research samples included men (31.6%) and women (68.4%); most of them had frequency in buying meat and meat-processed products for a few times per week (36.8%) and their meat shopping was often done at fresh markets (51.8%).

Regression analyses were conducted in order to see how each independent variable affects the dependent variable. Results revealed that **types of fresh meat** did not significantly affect buying interest ($\beta = -.007$, $t = -.229$, $p > .05$).

The presence of traceability systems significantly and positively affected buying interest ($\beta = .483$, $t = 16.242$, $p < .01$). In terms of **prices**, results showed that a 10% increase in price significantly had a negative impact on buying interest ($\beta = -.268$, $t = -7.798$, $p < .01$), while a 20% increase in price also significantly had a negative impact on buying interest ($\beta = -.458$, $t = -13.355$, $p < .01$) (usual price as a reference group). As for **distribution channels**, results indicated that the specialty stores did

not significantly affect buying interest ($\beta = .051, t = 1.494, p > .01$), while department stores significantly had a positive impact on buying interest ($\beta = .112, t = 3.269, p < .01$) (fresh market used as a reference group).

The results obtained from the regression analyses

suggest that the most influential variable in consumers' buying decision is the presence of traceability systems, followed by prices, and distribution places, while types of meat have no direct impact on the buying interest (see Table 1)

Table 1 Regression Results

Independent variables	β	T-Value	Sig
Product Type			
Fresh Meat	-.007	-.229	.819
Ref. Meat Products			
Product Attribute			
Traceability	.483	16.242	.000**
Ref. Non-Traceability			
Price			
Higher Price 10%	-.268	-7.798	.000**
Higher Price 20%	-.458	-13.355	.000**
Ref. Normal Price			
Place			
Specialty store	.051	1.494	.136
Supermarket	.112	3.269	.001**
Ref. Fresh Market			

Notes ** $p < .01$, * $p < .05$

ANOVAs were conducted to test the impact of independent variables that may determine buying interest in meat. The result revealed no significant impact of meat food types. That is, both types of meat food (meat-processed food $\bar{X} = 3.06$, fresh meat $\bar{X} = 3.04$, $F = .032, p > .1$) led to a similar level of consumers' buying interest, thus indicating that H1 was not supported. As for the presence vs. the absence of traceability systems, meat with traceability systems was of a higher result of buying interest (the presence of traceability systems $\bar{X} = 3.68$, the absence of traceability systems $\bar{X} = 2.43, F = 207.318, p < .01$), thus supporting H2. That is, meat traceability systems significantly affect consumers' buying interest.

Regarding prices, the same price as ordinary meat yielded the highest level of buying interest $\bar{X} = 3.71$, while 10% higher than market price $\bar{X} = 2.98$, and 20% higher than the market price $\bar{X} = 2.46$ ($F = 3.254, p < .05$), supporting H3, which indicated that retail prices significantly affected consumers' buying interest. As for distribution channels, department stores were of the highest buying interest $\bar{X} = 3.21$, followed by meat specialty stores $\bar{X} = 3.04$, and fresh markets $\bar{X} = 2.90$ ($F = 64.419, p < .01$), supporting the H4, that is, meat distribution places significantly affected consumers' buying interest (see Table 2).

Table 2 ANOVA Results

Independent variables	Mean	S.D	F	Sig.
Product Type			0.032	0.859
Fresh Meat	3.04	1.30		
Meat Products	3.06	1.30		
Product Attribute			207.318	.000**
Traceability	3.68	1.14		
Non-Traceability	2.43	1.12		
Price			3.254	.039*
Normal Price	3.71	1.18		
Higher Price 10%	2.98	1.20		
Higher Price 20%	2.46	1.18		
Place			64.419	.000**
Fresh Market	2.9	1.30		
Specialty store	3.04	1.24		
Supermarket	3.21	1.31		

Notes **p < .01, *p < .05

It is noteworthy that while the ANOVA results of H1 indicated that types of meat did not differently affect buying interests, in a test for an interaction effect between **types of meat-related food** and **traceability systems**, these two independent variables had a significant interaction effect on consumers' buying interest (F= 6.830, p < .01). That is, fresh meat with traceability systems had the buying interest of $\bar{X} = 3.77$, whereas fresh meat without

traceability systems had the buying interest of $\bar{X} = 2.32$. Meat-processed products with traceability systems were of buying interest of $\bar{X} = 3.59$ while those with traceability systems were of buying interest of $\bar{X} = 2.54$. In this light, the impact of traceability is more pronounced under fresh meat than meat-processed food (see Figure 1).

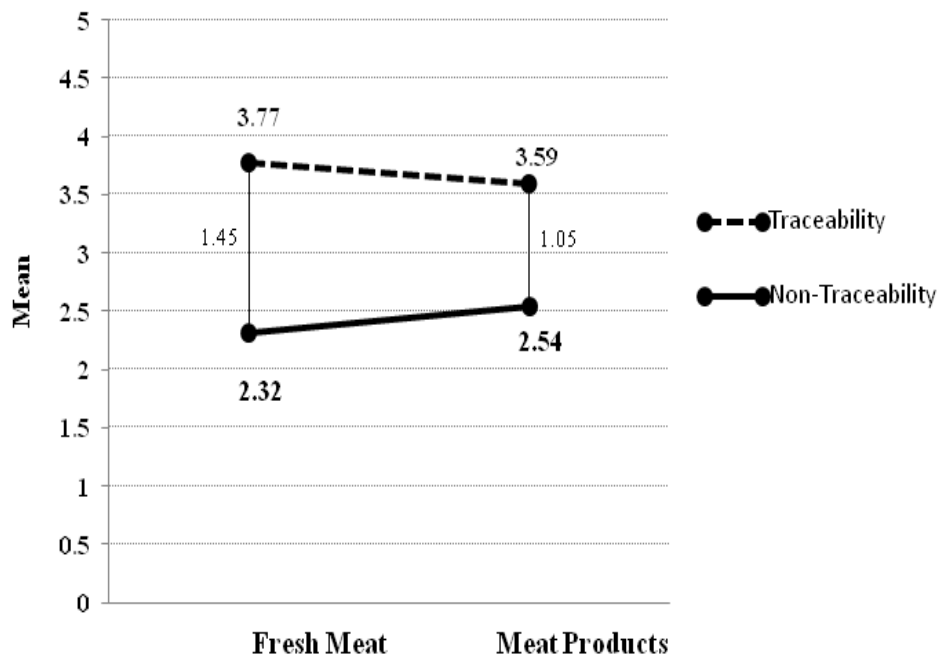


Figure 1 The mean difference of purchase attractiveness in Traceability Product Type

5. Discussions

5.1 Summary

Research results indicated that marketing variables that determine consumers' buying interest in meat are: 1) prices (normal price was of the highest buying interest); 2) distribution channels (department stores were of the highest buying interest); and 3) the presence vs. the absence of traceability systems (the presence of traceability systems was of the highest buying interest). In addition, the presence of traceability systems turned to be the best explanatory variable with a positive effect on consumers' buying interest. As for types of meat (fresh meat vs. processed meat products), the research results failed to support the research hypothesis as there was no direct difference in consumers' buying interest; however, in terms of an interaction effect between types of meat and the presence of traceability systems, significant impacts were found.

5.2 Discussion of research findings

These research results are useful information

for developing marketing mix strategies for meat product types. Further, the use of conjoint analysis in this research can explain the extent to which product characteristics may influence consumers' buying interests. The very first research finding indicated that meat products with traceability systems better attract consumers' interest, and thus make for the most influential variable in marketing mix which affects consumers' buying interest, compared to such other elements of marketing mix as prices and distribution channels.

Traceability systems are associated with awareness about quality and risks of products. This means that when consumers have no confidence in products, they will boost their consumption confidence with reliance on products with safety assurance marks (Zhao, Qiao and Chen, 2010), making room for traceability systems to influence consumers' buying interest. These research results are in accordance with the research conducted by Lo, Chang and Chang (2011) on product images and their impacts on products with traceability systems in terms of awareness about quality and risks of

products. They asserted that traceability systems have a positive impact on boosting consumer attitudes and awareness about meat quality, while being a factor creating confidence, leading to consumers' final buying decision. The second most influential variable is prices, another element of marketing mix. Some of the literature (e.g., Choe et al., 2009; Umberger, Boxall and Lacy, 2009; Lo, Chang and Chang 2011) found that consumers are willing to buy meat with traceability systems at higher price than they do for ordinary meat products. However, the current study's results are not exactly consistent with the previous research because there is a negative relationship between price increases and products. Even consumers tend to pay more interest in buying food with traceability systems, most of them still want to pay at usual market price. This means that if producers increase the price of meat and meat-processed products with traceability systems for 10% or 20%, it will make consumers less interested in such products.

Finally, distribution channels are relevant to consumers' buying interest in meat. Specifically, supermarkets were identified as the most interesting place for buying meat with traceability systems by customers, though general consumers often buy meat at fresh markets (51.8%). This may reflect a consumer view on awareness about quality and risks, derived from different distribution places. Consumers may have an opinion that shopping food at supermarkets, compared to buying at fresh markets, provides them with a better chance to consider product labels detailing traceability systems, for example, the origin of cattle farms, animal feeds for the cattle, places for manufacturing and product inventory. Supermarkets thus seem to offer a meat buying channel that better suits the needs of consumers, especially when they want to reduce risks involved in buying meat products.

5.3 Recommendation of Managerial Implications

For marketers, the research result also showed some directions on how to apply traceability systems as a

marketing tool so as to attract more customers in increasingly fierce competition of the meat industry these days. This is particularly useful in the case of the application of traceability systems to fresh meat products which were reportedly more different in buying interest (the presence vs. the absence of traceability systems) than meat-processed food as discovered in the present study. This suggests that in devising a marketing strategy for fresh meat, marketers need to draw on traceability systems more than they do for meat-processed products, which are already cooked.

However, prices for meat with traceability systems, often higher than usual, remain a challenge for producers and marketers. This can be alleviated with the use of marketing tool to convince their consumers of the difference in safety and quality between meat with traceability systems and those without in order to create awareness and a positive attitude on meat with traceability systems, which may cost more. In addition, catering for consumers who have high expectations and basically decide on product quality (Dodds, Monroe, and Grewal, 1991 ; Grewal et al., 1998; Baker and Burnham, 2001), or those with special attention to food safety, including focusing on department stores as distribution channels, may help access this market segment with high purchasing power.

6. Limitations and Future Research Directions

Limitations of the current study are derived from the use of situation-based characteristics of meat products with no specific indication of the real prices and specific brand of distribution channels or actual names of different existing producers who are involved with traceability systems. This is because the study focuses on the overall characteristics of possible meat products, drawn from the concept of marketing mix. Therefore, future research

should focus on comparing consumers' buying interest with specific indication of prices and distribution channels of meat products with traceability systems, which are available in the market. In addition, as the current research does not emphasize any particular type of meat, future research is advised to conduct a comparative study of meat products, between those with traceability systems and those without traceability systems, with specific meat types such as pork, chicken and beef, in both fresh meat type and meat-processed one.

Finally, the research found that consumers tend to be interested in buying meat and products with traceability systems. Future research thus should focus on relationships between such other variables as consumer personality and relationships with brand images in order to make use of these possible research results to better target consumers who care for meat products with traceability systems.

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8. References

- Alfaro, J.A., and Rabade, L.A. 2009. Traceability as a strategic tool to improve inventory management : A case study in the food industry. **International Journal of Production Economics** 118(1): 104–110.
- Baker, G.A., and Burnham, T.A. 2001. Consumer response to genetically modified foods: market segment analysis and implications for producers and policy makers. **Journal of Agricultural and Resource Economics** 26(2): 387–403.
- Becker, T., Benner, E., and Glitsch, K. 2000. Consumer perception of fresh meat quality in Germany. **British Food Journal** 102 (3): 246-266.
- Buppapun,W.and Thunyapornsakol, N. 2011. A study of market channel selection of small scale cane growers the case of United Farmer and Industry Co., Ltd. Khon Kaen. **KKU Research Journal of Humanities and Social Sciences(be)** 10(2): 212-224.
- Burgos, S., and Burgos, S. A. 2007. Avian Influenza Outbreaks in Southeast Asia Affects Prices, Markets and Trade: A Short Case Study. **International Journal of Poultry Science** 6(12): 1006-1009.
- Cabeza, M.C., de la Hoz, L., Velasco, R., Cambero, M.I., and Ordóñez, J.A. 2009. Safety and quality of ready-to-eat dry fermented sausages subjected to E-beam radiation. **Meat Science** 83(2): 320–327.
- Charles,V., Kumar,M. and Anand,T. 2011. Conjoint analysis and MDS approach to brand improvement of an aerosol product. **Journal of CENTRUM Cathedra** 4(1): 27-43.
- Choe, Y.C., Park, J., Chung, M., and Moon,J. 2009. Effect of the food traceability system for building trust: Price premium and buying behavior. **Information Systems Frontiers** 11(2): 167-179.

- Department of Industry Promotion, Thailand. 2009. Traceability system and a secret of food safety. **Journal of Department of Industry Promotion** 52(3): 32-34.
- Dickinson, D. L., and Bailey, D. V. 2002. Meat traceability: Are U.S. consumers willing to pay for It?. **Journal of Agricultural and Resource Economics** 27(2): 348-364.
- Dodds, W.B., Monroe, K.B., and Grewal, D. 1991. Effects of price, brand, and store Information on buyers' product evaluations. **Journal of Marketing Research** 28(3): 307-319.
- Giraud, G. and Amblard, C. 2003. What does traceability mean for beef meat consumer?. **Food Science** 23(1): 40-64.
- Grewal, D., Krishnan, R., Baker, J., and Borin, N. 1998. The effect of store name, brand name and price discounts on consumers' evaluations and purchase intentions. **Journal of Retailing** 74(3): 331-352.
- Green, P. E., and Srinivasan, V. 1978. Conjoint analysis in consumer research: Issues and outlook. **Journal of Consumer Research** 5(2): 103-123.
- Grunert, K.G., Bredahl, L., and Brunso, K. 2004. Consumer perception of meat quality and implications for product development in the meat sector—a review. **Meat Science** 66(2): 259-272.
- Grunert, K.G. 2005. Food quality and safety: consumer perception and demand. **European Review of Agricultural Economics** 32(3): 369-391.
- Hair, J. F., Anderson, R. E., Tatham, R. L., and Black, W. C. 1998. **Multivariate data analysis**. Upper Saddle River. New Jersey: Prentice-Hall International.
- Hauser, J.R., and Rao, V.R. 2002. Conjoint Analysis, Related Modeling, and Application. *Advances in Marketing Research: Progress and Prospects*. 23 (September): 1-32. Retrieved October, 2011, from <http://web.mit.edu/~hauser/www/Papers/GreenTributeConjoint092302.pdf>
- Hobbs, J.E., Bailey, D.V., Dickinson, D.L., and Haghiri, M. 2005. Traceability in the Canadian red meat sector: Do consumers care?. **Canadian Journal of Agricultural Economics** 53(1): 47-65.
- Kehagia, O., Chrysochou, P., Chrysochoidis, G., Krystallis, A., and Linardakis, M. 2007. European consumer's perceptions, definitions and expectations of traceability and the importance of labels, and the differences in these perceptions by product type. **European Society for Rural Sociology** 47(4): 400-416.
- Lo, H. C., Chang, H. C., and Chang, C. F. 2011. The effects of brand image and traceability certification on consumer's value perceptions: mediating role of perceived quality and perceived risk. Retrieved September 11, 2011, from <http://www.docstoc.com/docs/83071199/THE-EFFECTS-OF-BRAND-IMAGE-AND-TRACEABILITY-CERTIFICATION-ON>
- Mangaraj, S., and Senauer, B. 2001. A segmentation analysis of U.S. grocery store shoppers. Retrieved October 15, 2011, from <http://ageconsearch.umn.edu/bitstream/14328/1/tr01-08.pdf>
- Mazzocchi, M., Lobb, A. E., and Traill, W.B. 2006. Food Scared and consumer behavior: A European perspective. Retrieved October 12, 2011, from <http://ageconsearch.umn.edu/bitstream/25613/1/cp060505.pdf>
- Piemkhontham, T., and Ruenrom, G. 2010. Perception and acceptance towards traceability system in selling meat products. **Chulalongkorn Business Review** 32(123): 73-107.
- Pouliot, S., and Sumner D. A. 2007. Traceability, liability, and incentives for food safety and quality. **American Journal of Agricultural Economics** 90(1): 15-27.
- Resurreccion, A.V.A. 2003. Sensory aspects of consumer choices for meat and meat products. **Meat Science** (66): 11-20.

- Richardson, P. S., Dick, A.S., and Jain. A. J. 1994. Extrinsic and intrinsic cue effects on perceptions of store brand quality. **The Journal of Marketing** 58(4): 28-36.
- Rijswijk, W.V., and Frewer, L.J. 2008. Consumer perceptions of food quality and safety and their relation to traceability. **British Food Journal** 110(10): 1034-1046.
- Sans, P., de Fontguyon, G., and Giraud, G. 2008. Value-based labels for fresh beef: an overview of French consumer behaviour in a BSE crises context. **International Journal of Consumer Studies** 32(5): 407-413.
- Thilmany, D.D., Umberger, W.J., and Ziehl, A. R. 2006. Strategic market planning for value-added natural beef products: A cluster analysis of Colorado consumers. **Renewable Agriculture and Food Systems** 21(3): 192-203.
- Umberger, W.J., Boxall, C.P., and Lacy, C.R. 2009. Role of credence and health information in determining US consumer's willingness-to-pay for grass-finished beef. **Journal of the Australian Agricultural and Resource Economics Society** 53(4): 603-623.
- Verbeke, W., and Vackier, I. 2004. Profile and effects of consumer involvement in fresh meat. **Meat Science** 67(1): 159-168.
- Yeung, R.M.W., and Morris, J. 2001. Consumer perception of food risk in chicken meat. **Nutrition and Food Science** 31(6): 270-278.
- Zhao, R., Qiao, J., and Chen, Y. 2010. Influencing factors of consumer willingness-to-buy traceable foods: An analysis of survey data from two Chinese cities. **Agriculture and Agricultural Science Procedia** 1: 334-343.