

***CONSUMER BEHAVIORS OF MEAT WITH TRACEABILITY
IN THAILAND: THE PSYCHOLOGICAL MECHANISM***

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The Asian Conference on Psychology and the Behavioral Sciences 2014
Official Conference Proceedings 2014

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ABSTRACT

Since the outbreak of mad cow disease and avian flu, consumers have become more concerned about safety issues of meat products. Therefore, meat traceability is now used as a strategic tool to cope with this food safety crisis. In Thailand, traceability is rarely managed as a marketing tool to persuade consumers who are meat end users. Consequently, to explore the possibility and effectiveness of this strategic approach, this study aims to investigate the psychological mechanism in perception of the meat traceability system. The results from the study reveal that product class knowledge and perceived informativeness of traceability system have negative influence on fear for seller opportunism which, in turn, has positive influence on perceived uncertainty of the purchase of meat with traceability system. Although perceived informativeness of traceability also has a direct impact on perceived uncertainty, fear for seller opportunism appears to have a mediating role in this set of relationships. A number of research implications and future study directions are offered at the end of this study report.

KEYWORDS: Meat Traceability, Product Class Knowledge, Perceived Informativeness, Fear for Seller Opportunism, Perceived Uncertainty

1. INTRODUCTION

The emergence of mad cow disease in Europe (Sans, de Fontguyon & Giraud, 2008) and H5N1 bird flu in poultry in Asia (Burgos & Burgos, 2007) engender consumer's concern about meat product safety which possibly causes perceived uncertainty that negatively influences purchase intention and actual purchase (Pavlou, Liang & Xue, 2007). Therefore, the concern for food safety has been particularly pronounced for meat products after the crisis in many parts of the world.

Responding to the circumstance, Thai government has provided the initiative for safety and standard measurement of meat production. For example, the Department of Livestock Development has launched campaigns relating to the meat product safety issue to encourage consumers to buy meat and meat-processed products that have the letter "Q" on the packages. The "Q" label certifies that the products are thoroughly safely controlled throughout the production process from cattle farms to the consumers' baskets (Piemkhoontham & Ruenrom, 2010). Moreover, in some private sections, leading Thai companies which operate a comprehensive meat business have developed the traceability systems to standardize the quality and safety of their meat production (Department of Industry Promotion, Thailand, 2009).

The traceability system is informative technology that records and displays information of every step of meat production processes (Hobbs, 2004). Although the system has been used within the main cycle of manufacturer-wholesaler-retailers in Thailand, its role as a marketing tool assuring target consumers of meat products is still scant. One reason could be attributed to the lack of profound understanding of what psychological factors are involved in meat consumption.

As a result, the present study attempts to fill this gap by examining the meat traceability system as a possible mitigator of perceived uncertainty in meat purchasing process in Thailand. It is expected that the findings from this study will be able to contribute marketing literature by empirically illustrating how the four psychological variables which are (a) product class knowledge, (b) fear for seller opportunism, (c) perceived informativeness, and (d) perceived uncertainty can be relevant to marketers and academics who are interested in using the traceability system as the marketing tool.

2. CONCEPTUAL FRAMEWORK AND HYPOTHESES

Product class knowledge

Product class knowledge refers to personal familiarity and experience with a product accumulated through purchasing and consuming . For example, meat, as all food products, is an experience product, and consumers will only be able to anticipate its quality before the purchase. That is, consumers may evaluate the quality of the products by activating knowledge structures that they have gained from previous experience based on various intrinsic (e.g., color and fat) and extrinsic cues (e.g., brands, prices and origins) (Banovic et al., 2012).

Previous product knowledge does not only enrich the consumers' understanding of the products cues but also leads to more precise and stable expectations (Halstead,

Hartman & Schmidt, 1994). Moreover, consumers with more product knowledge often have greater awareness of available products reducing uncertainty and perceived risks in their mind (Xingyuan, Li & Wei, 2010). In this sense, product knowledge could also decrease consumers' fear for seller opportunism.

The knowledge represents two dimensions that are objective knowledge and subjective knowledge (Park & Lessig, 1981). On one hand, objective knowledge can be characterized as the stored information and its organization in memory or what the consumers actually know about the products. Subjective knowledge, on the other hand, represents consumers' personal perceptions towards what and how much they know about the products (Banovic et al., 2012). Consumers with more objective product knowledge often have more subjective knowledge and stronger confidence in their purchase (Xingyuan, Li & Wei, 2010). In addition, Park & Lessig (1981) suggest that subjective knowledge may be able to better measure consumers' self-confidence than objective knowledge does. Thus, this study would like to focus only on subjective knowledge in meat consumption contexts.

Perceived Informativeness

The perceived informativeness of the traceability system can be differentiated from the actual or objective number of types of informational cues provided by the sellers. In the purchase decisions, consumers may fear that sellers deceive about the quality of products. As a result, consumers usually search for more information relating to those particular products. Consumers can use the information from websites, packaging labels, or signs on the products in order to evaluate the trustworthiness of the sellers as well as the products. When sellers can provide sufficient information in a straight forward manner, consumers can use the relevant information to finalize their purchasing decisions. This perceived informativeness from the sellers' actions could, therefore, show how professional the sellers are, and that could imply the high degree of trustworthiness. Consumers, hence, become more relieved that the sellers will not take advantages from them through deception in product quality; for instance, they are not likely to sell the product with lower quality than that advertised (Pavlou, Liang & Xue, 2007).

This perceived informativeness is particularly critical for food products because consumers often cannot accurately evaluate the product safety only with their physical eyes. In consequence, the provision of detailed product information in various aspects as well as the information regarding the manufacturers or sellers will guarantee consumers that they receive sufficient information to drive their purchase decisions (Aboulnasr, 2006).

Fears for Seller Opportunism

Fears for seller opportunism (Pavlou, Liang & Xue, 2007) often takes place in the situations that consumers do not possess the ability or opportunity to completely check sellers behaviors. Consequently, consumers might be worried that sellers may become opportunistic by purposely omitting some negative information. Deception in product quality and false advertising (Mishra et al., 1998) are examples of this fear which are able to increase perceived uncertainty in purchasing.

When consumers are not certain about the outcome of purchase decisions, they may rely on extensive information search beforehand to gain more knowledge and understanding of the actual product attributes (Fazio & Zanna, 1987 as cited in Xing, Li & Wei, 2010). During the information search process, consumers are likely to have confidence in sellers who can sufficiently provide detailed product information. The confidence in sellers will be even higher if the provided information can be used to trace back the products when problems occur after the purchase. This useful information, thus, is likely to alleviate consumers' fear for seller opportunism (Choe et al., 2009).

Perceived Uncertainty

Perceived uncertainty refers to the extent to which the outcome of a transaction cannot be accurately projected (Pavlou, Liang & Xue, 2007). It also exists when there is no knowledge of a precise probability (Knight, 1948 as cited in Mitchell, 1999). In buyer-seller relationships, perceived uncertainty often occurs when buyers have difficulties in predicting whether the particular sellers will act opportunistically because buyers cannot completely monitor the sellers behaviors (Pavlou & Fygenson, 2006). Previous research indicates that perceived uncertainty has a large impact on purchase intentions and price premium (Choe et al, 2009).

Sources of the uncertainty (Pavlou, Liang & Xue, 2007) include information asymmetry, seller opportunism, privacy concerns, and security concerns. Pavlou et al. (2007) tried to examine uncertainty mitigators based on the agency theory. Their result revealed that one antecedent of perceived uncertainty was fear for seller opportunism which could be mitigated by perceived informativeness. Besides, Banovic et al. (2012) explained that the higher degree of product class knowledge might also contribute to reduction of consumers' uncertainty in their purchase.

Based on the literature review above, the present study would like to propose the following hypotheses:

- H1: Product class knowledge negatively influences fear for seller opportunism.
- H2: Product class knowledge negatively influences perceived uncertainty.
- H3: Perceived informativeness of meat traceability system negatively influences fear for seller opportunism.
- H4: Perceived informativeness of meat traceability system negatively influences perceived uncertainty.
- H5: Fear for seller opportunism positively influences perceived uncertainty.
- H6a: Fear for seller opportunism mediates the influence of product class knowledge on perceived uncertainty.
- H6b: Fear for seller opportunism mediates the influence of perceived informativeness on perceived uncertainty.

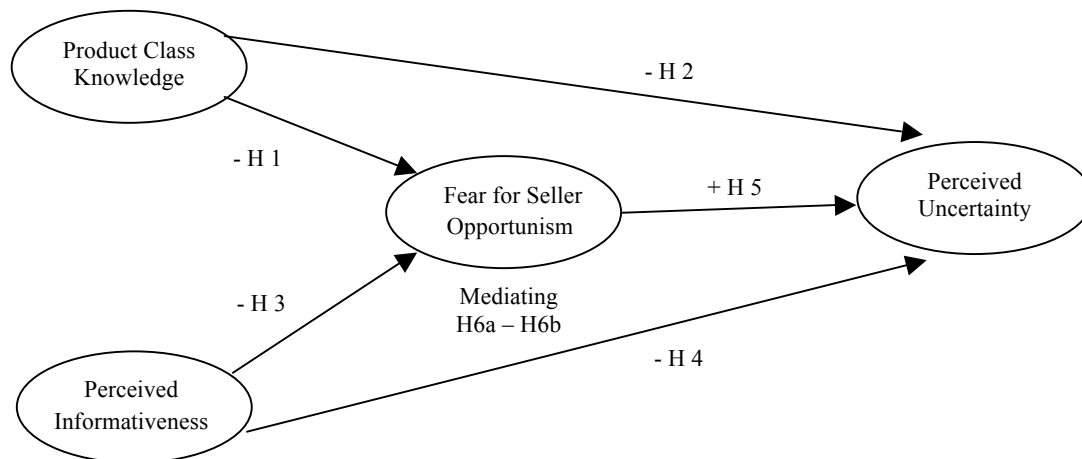


Figure 1. Conceptual model and hypotheses

3. METHOD

Sample characteristics

The surveys were distributed to 210 consumers in the north-east of Thailand via judgmental sampling. The profile of the research participants was: females (68%), between 21 to 30 years old (58%), bachelor's degree graduates (68%), government officials (38%), and with the incomes of 10,001-20,000 baht/month (61%).

The research participants were firstly informed of the study description. Subsequently, they were requested to complete the measures of product class knowledge, fear for seller opportunism, perceived informativeness of traceability system, and perceived uncertainty of meat traceability system. Finally, the participants were asked to provide their personal data.

Measures

The research participants were instructed to indicate the degree to which they agreed or disagreed with each of Likert-type scale items. First, product class knowledge was measured by three items (e.g., "In general, how knowledgeable are you about different types of meat product in the market?") adopted from Mukherjee & Hoyer (2001). Participants rated their knowledge with each statement from 1 (not at all knowledgeable) to 5 (very knowledgeable).

Next, the participants rated the degree to which they agreed or disagreed with each of the scale items of the other three constructs (1= strongly disagree, 5 = strongly agree). Perceived informativeness of traceability system was measured by three items (e.g., "I would learn a lot from using the traceability system.") adapted from Luo (2002). Fear for seller opportunism was measured by three items (e.g., "The producers of meat products selling through the traceability system will not cheat consumers.") adapted from Pavlou, Liang & Xue (2007). Finally, perceived uncertainty of traceability system was measured by four items (e.g., "Purchasing meat products through the

traceability system will decrease the degree of uncertainty associated with the products.”) adapted from Choe et al. (2009).

Procedures

Descriptive statistics including the means and standard deviations were examined first followed by correlations. Next, the latent construct structures were investigated with confirmatory factor analysis (CFA) using AMOS 21. Finally, a structural equation model (SEM) was estimated to explore the relationships among the four latent constructs. The traditional chi-square was reported as a fit measure, although it is quite sensitive to large sample size. Hence, we also report five additional fit measures: root mean square error of approximation (RMSEA), goodness of fit index (GFI), adjusted goodness of fit index (AGFI), comparative fit index (CFI), and Tucker-Lewis index (TLI). Ideally, the acceptable models should have an insignificant chi-square (χ^2), RMSEA < 0.08, GFI, AGFI, CFI, and TLI greater than 0.90 (Hair et al., 2010).

4. RESULTS

1) Descriptive statistics and correlation analyses

Table 1 presents the means and standard deviations for the four constructs. All constructs are significantly correlated in this study.

Table 1
Descriptive Statistics and Correlations

Constructs	Mean	S.D.	1	2	3	4
1. Product Class Knowledge	3.13	.74	1			
2. Perceived Informativeness	3.80	.70	.209**	1		
3. Fear for Seller Opportunism	2.53	.76	-.243**	-.428**	1	
4. Perceived Uncertainty	3.93	.69	-.126*	-.633**	.523**	1

** significant at the .01 level

* significant at the .05 level

2) Measurement model results

Anderson & Gerbing’s (1988) procedure was adopted to assess the convergent and construct validity of the measurement model. A first-order confirmatory factor analysis (CFA) was used to examine the four latent constructs. The results indicated that standardized loadings varied from .79 to .94 which were all highly significant. The composite reliabilities varied from .95 to .97 exceeding the generally accepted criteria of .70. The average variance extracted varied from .72 to .79; thus, the findings reached the criteria of .50 or greater (Hair et al., 2010; Bagozzi & Yi, 1988). A second-order CFA was used to examine the overall fit of the measurement model (see Table 2). The results showed the overall goodness-of-fit assessment for second-order CFA as follows: chi-square = 83.857, df = 59, chi-square/df = 1.421, p = .018,

RMSEA = .045, GFI = .943, AGFI = .912, CFI = .988 and TLI = .984. The chi-square/df was smaller than 3.0 and GFI, AGFI, CFI, and TLI were higher than the suggested criteria of .90 (Hair et al., 2010). The results reveal marked that there was a satisfactory between the proposed model and the data.

Table 2
Results of Confirmatory Factor Analysis (CFA)

Items	Std. Loading	t-value	C.R.	AVE
<i>Product Class Knowledge</i>				
1) Comparing to other people you know, how much are you knowledgeable of different types of meat products in the market?	.92	a		
2) In general, how well are you knowledgeable of different types of meat products in the market?	.93	19.99		
3) Comparing to your friends, how many experiences do you have with different types of meat products?	.81	15.79	.95	.79
<i>Perceived Informativeness</i>				
1) The traceability system will be able to give me quick and easy access to large scales of the in-depth information.	.82	a		
2) I am likely to learn a lot from the traceability system.	.84	13.75		
3) The traceability system could give me extensive information.	.89	14.75	.97	.72
<i>Fear for Seller Opportunism (items reverse-coded)</i>				
1) The producers of meat products who use traceability system will not be able to cheat consumers.	.79	a		
2) The sellers of meat products who sell through the traceability system will not be able counterfeit the circulation period of the goods.	.94	18.00		
3) The traceability system will decrease the possibility of illegal production.	.87	14.28	.97	.75
<i>Perceived Uncertainty (items reverse-coded)</i>				
1) Purchasing meat products through the traceability system will possibly decrease uncertainty and hesitation of consumers towards the products.	.91	a		
2) Purchasing meat products through the traceability system could decrease the degree of uncertainty that specifically occurs as a post-purchasing reaction.	.86	17.95		

Items	Std. Loading	t-value	C.R.	AVE
3) Purchasing meat products through the traceability system will increase confidence in the products.	.87	18.21		
4) When I am not confident in purchasing meat products, I will use the traceability system to overcome the hesitation.	.82	16.09	.97	.75

$\chi^2 = 83.857$, $df = 59$, $\chi^2/df = 1.421$, $p = .018$,
 RMSEA = .045, GFI = .943, AGFI = .912, CFI = .988, TLI = .984

^a The corresponding parameter is fixed to a value of 1.00 in order to set the scale of measurement.

3) Structural model results

After the measurement model had been approved, the next step was to test the research hypotheses by using SEM (see Figure 2).

Hypothesis 1 examined the negative impact of product class knowledge on fear for seller opportunism. The results indicated that the product class knowledge significantly and negatively influenced fear for seller opportunism ($\beta = -.18$, $t = -2.62$, $p < .01$). Thus, H1 was supported.

Hypothesis 2 examined the negative impact of product class knowledge on perceived uncertainty. The results revealed no significant impact of product class knowledge on perceived uncertainty ($\beta = -.07$, $t = -1.28$, $p > .05$). H2, therefore, was not supported.

Hypothesis 3 examined the negative impact of perceived informativeness on fear for seller opportunism. The results revealed that perceived informativeness had significant and negative influence on the fear for seller opportunism ($\beta = -.40$, $t = -5.32$, $p < .001$). As a result, H3 was supported.

Hypothesis 4 examined the negative impact of perceived informativeness on perceived uncertainty. The results showed that perceived informativeness significantly and negatively affected perceived uncertainty ($\beta = -.57$, $t = -8.04$, $p < .001$). Hence, H4 was also supported.

Hypothesis 5 examined the positive impact of fear for seller opportunism on perceived uncertainty. The results revealed that fear for seller opportunism significantly had a positive effect on perceived uncertainty ($\beta = .31$, $t = 4.69$, $p < .001$). Consequently, H5 was supported, as well.

Sobel's (1982) test statistic was adopted to test the mediating effects of fear for seller opportunism. *Hypothesis 6a* examined the mediating effect of fear for seller

opportunism on the relationship between product class knowledge and perceived uncertainty. The results showed that the mediating effect of fear for seller opportunism to the influence of product class knowledge on perceived uncertainty was significant ($\gamma = .06$, z -test = -2.38, $p < .05$). Therefore, H6a was supported.

Hypothesis 6b examined the mediating effect of fear for seller opportunism on the relationship between perceived informativeness and perceived uncertainty. The results showed that the mediating effect of fear for seller opportunism to the influence of perceived informativeness on perceived uncertainty was significant ($\gamma = .12$, z -test = -3.41, $p < .001$). Therefore, H6b was supported.

Table 3
Results of Structural Model

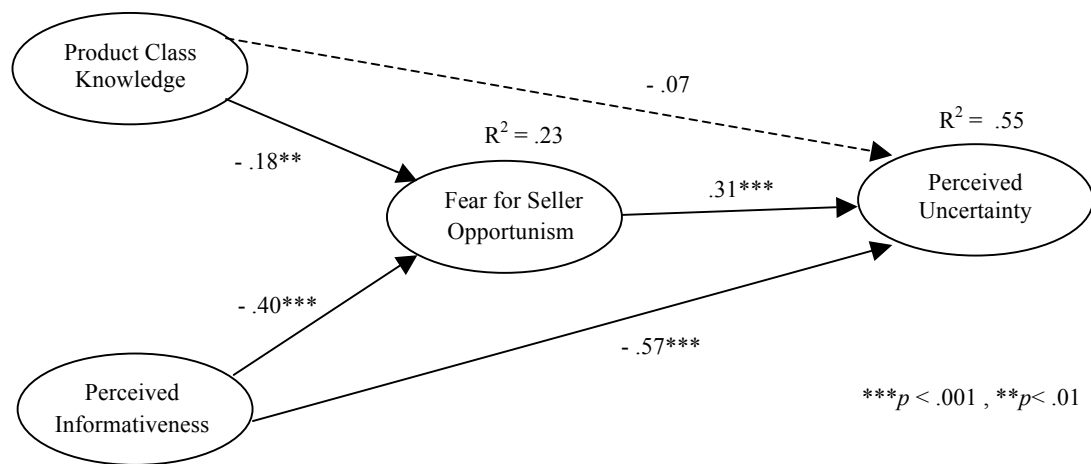
Hypotheses / path	Beta	S.E.	t-value	
H1: Product Class Knowledge → Fear for Seller Opportunism	-.18**	.06	-2.62	supported
H2: Product Class Knowledge → Perceived Uncertainty	-.07	.06	-1.28	not supported
H3: Perceived Informativeness → Fear for Seller Opportunism	-.40***	.08	-5.32	supported
H4: Perceived Informativeness → Perceived Uncertainty	-.57***	.07	-8.04	supported
H5: Fear for Seller Opportunism → Perceived Uncertainty	.31***	.06	4.69	supported
<i>Mediating effects</i>			<i>z-test^a</i>	
H6a: Product Class Knowledge → Fear for Seller Opportunism → Perceived Uncertainty	-.06* ($a = -.18 \times b = .31$); $SE_a = .07$; $SE_b = .06$		-2.38*	supported
H6b: Perceived Informativeness → Fear for Seller Opportunism → Perceived Uncertainty	-.12*** ($a = -.40 \times b = .31$); $SE_a = .08$; $SE_b = .06$		-3.41** *	supported

Hypotheses / path	Beta	S.E.	t-value
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Note : ***p < .001 , **p < .01 , *p < .05

^a Mediation was tested via a z-test, which calculated using the Sobel's (1982) approach ;

$z = ab/SE_{ab}$, $SE_{ab} = \sqrt{b^2SE_a^2 + a^2SE_b^2}$ Where *a* is the regression coefficient for the relationship between the independent and the mediator variables; *b* is the regression coefficient for the relationship between the mediator and the dependent variables; *SE_a* is the standard error of the relationship between the independent and the mediator variables, and *SE_b* is the standard error of the relationship between the mediator and the dependent variables



Notes : chi-square = 83.857, df = 59, chi-square /df = 1.421, p = .018, RMSEA= .045, GFI = .943, AGFI = .912, CFI = .988, TLI = .984

Figure 2. Results of the hypothesized model

5. DISCUSSIONS

1) Summary

The results of our study which was conducted in Thailand revealed that among Thai consumers, product class knowledge and perceived informativeness of the traceability system negatively influenced fear for seller opportunism which, in turn, positively influenced perceived uncertainty of the purchase of meat with the traceability system. Perceived informativeness of the traceability system also had a direct impact on perceived uncertainty. Fear for seller opportunism appeared to have a mediating role in these two sets of relationships.

2) Theoretical Implications

This study analyzed the psychological mechanism that could explain consumers' behaviors in the meat traceability system contexts. We modified the uncertainty model of Pavlou, Liang, & Xue (2007) regarding how to mitigate perceived uncertainty. The findings from the present study confirmed that there was a significant negative relationship between uncertainty mitigators (perceived informativeness) and uncertainty antecedent (fear for seller opportunism).

More specifically, we suggested a new strategy, the product class knowledge, which was considered as an uncertainty mitigator. Although the product class knowledge did not directly influence perceived uncertainty, we found its indirect impact via fear for seller opportunism which acted as a mediator in this set of relationships. In this sense, meat product knowledge might help consumers reduce their fear for seller opportunism first and then increase confidence in the purchase process.

Finally, the present study also importantly contributed to the cross-cultural consumer behavior areas by examining the consumers' responses to the traceability system in Thailand as only few studies had been conducted to examine the similar topics in Asia (Choe et al., 2009; Wu et al., 2011).

3) Managerial implications

Based on the results, marketers may consider using the meat traceability system as a marketing tool to provide more information about meat purchase to consumers. As perceived informativeness has been found to reduce fear for seller opportunism and perceived uncertainty in the meat purchase, the traceability system appears to act as a meat purchasing guide which could communicate how much and what aspects of information consumers would be given regarding the meat purchase: for example, sources of origins, production methods, ingredients, manufacturers, warehouses, distributors, selling places, and product movements from the starting points to the endusers (Hobbs et al., 2005). In this regard, marketers could effectively persuade consumers by focusing on the sufficient information which is able to be obtained from the meat traceability system.

Moreover, because the product class knowledge has also been found to lessen fear for seller opportunism and perceived uncertainty, marketers are required to inform consumers who need more knowledge about meat purchasing, and the traceability

system could be helpful for them to learn a lot. As a consequence, they will be able to lessen degrees of fear for seller opportunism and uncertainty in their mind resulting in stronger confidence of meat products with the help from the traceability system.

4) Direction for future research

The present study has a number of limitations which suggest several directions for future research. First of all, the role of demographic variables, such as genders, ages, or incomes may also be explored to achieve a better and deeper understanding of consumer behaviors in response to the meat traceability system. Second, since this study used survey data alone, additional research methods such as in-depth interviews and experiments may be combined to gain a better understanding of consumer behaviors. Finally, future studies may extend this model regarding how perceived uncertainty influences other factors such as purchase intentions actual purchase or word-of-mouth.

ACKNOWLEDGEMENT

This work was supported by (1) the Higher Education Research Promotion and National Research University Project of Thailand, Office of the Higher Education Commission, through the Food and Functional Food Research Cluster of Khon Kaen University, and (2) Faculty of Management Science, Khonkaen University.

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