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**KOREAN CONSUMERS' ATTITUDE TOWARDS FOOD RISK
MANAGEMENT QUALITY (FRMQ) OF GOVERNMENT
AND PRIVATE FIRMS**

This study assessed how Korean consumers developed their attitude towards the quality of food risk management (FRMQ) which was carried out by government and private firms in the food industry of South Korea. From this analysis, important determinants affecting perceived performance of FRM by government and private firms were identified. Separate models for government FRM and private firm's FRM were developed and empirically estimated in order to explore whether Korean consumers differentiate their perception and evaluation of the private and public systems. The study provides a meaningful addition to current literature as it reports consumers' perception of FRMQ from Korean perspectives, and in particular, Korean consumers' attitude towards FRM systems for government and private firms in the food industry.

Keywords: food risk management; South Korea; consumer attitude; food safety.

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**СТАВЛЕННЯ ПІВДЕННОКОРЕЙСКИХ СПОЖИВАЧІВ
ДО ЯКОСТІ ДЕРЖАВНОЇ ТА ПРИВАТНИХ СИСТЕМ
УПРАВЛІННЯ ХАРЧОВИМИ РИЗИКАМИ**

У статті показано, як розвивається ставлення південнокорейських споживачів до якості систем управління харчовими ризиками – на державному рівні та на рівні приватного бізнесу. Побудовано дві окремі моделі за результатами аналізу і порівняння – для державної системи захисту від харчових ризиків і для бізнес-систем захисту від таких ризиків. Продемонстровано, що існує суттєва різниця у сприйнятті споживачами в Південній Корейі того, хто та яким чином має захищати та захищає споживачів від харчових ризиків.

Ключові слова: управління харчовими ризиками; Південна Корея; ставлення споживачів; безпека продуктів харчування.

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**ОТНОШЕНИЕ ЮЖНОКОРЕЙСКИХ ПОТРЕБИТЕЛЕЙ
К КАЧЕСТВУ ГОСУДАРСТВЕННОЙ И ЧАСТНЫХ
СИСТЕМ УПРАВЛЕНИЯ ПИЩЕВЫМИ РИСКАМИ**

В статье показано, как развивается отношение южнокорейских потребителей к качеству систем управления пищевыми рисками – на государственном уровне и на уровне частного бизнеса. Построены две отдельные модели по результатам анализа и сравнения – для государственной системы защиты от пищевых рисков и для бизнес-систем защиты от таких рисков. Доказано, что существует значительная разница в восприятии потребителями в Южной Корее того, кто и каким образом должен защищать и защищает потребителей от рисков в сфере продуктов питания.

Ключевые слова: управление пищевыми рисками; Южная Корея; отношение потребителей; безопасность продуктов питания.

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Introduction. Increased agri-food trade and integrated food supply chain worldwide resulted in risk complexity in the food industry, and there is an increasing sense of urgency for transparent government intervention with citizen-centric government (Adams, 1999; Houghton, Van Kleef, Rowe and Frewer, 2006). A variety of food concentrates public attention on food safety issues and the public became more critical about food safety management which is performed by both public and the private sectors. When risks are manifested in food safety crises, there is substantial negative health, safety, environmental, reputational and financial implications. Thus, the concept of engaged risk management and communication became particularly important for society in order to obtain sustainable environment for food supply chain, and consequently, public demands for more proactive risk management increased exponentially. Risk management involves identifying those risks that require management, the range of options that could effectively treat risks, deciding on the actions that will provide the required level of management, and implementing the selected measures (Meek, 2007). The ultimate purpose of risk management is on prevention, and the regulator identifies risk that may require management in order to prevent adverse outcomes from being realized. It also addresses how to manage when adverse outcomes occurs, and develop contingency plans to minimize impacts.

Success of food safety management is strongly affected by the extent of food risk management quality (FRMQ), which can be executed both by public and private sectors. This subsequently raised awareness on the importance of shared responsibility of managing our environmental resources among shareholders such as industries, companies, governments, NGOs and consumers. In order to sustain FRMQ approved by shareholders, risk communication needs to be effectively flowed among shareholders (Lee, 2007; Lee and Park, 2006). Consumers in particular, expressed increasing concerns for food safety, and public policy on food safety management has been in the heated public debate for the past two decades. Consumer attitudes and perception of FRMQ impact effectiveness and success of FRMQ since consumers are the ultimate judge and the end user of food in which risks are managed by regulators (Woo, 2007; Choi, 2010). A long-standing policy objective in the food and agricultural sector is the assurance of safe food supply for the general public, and public awareness of food safety continues to be publicized by events reported in media (Conley and Wade, 2007). Understanding the consumer perception of FRMQ may provide meaningful feedback to current performance of FRMQ and suggest future directions for developing effective food risk management and communication strategies.

Korean consumers exhibit relatively high degree of concern for food safety (Kim, 2007; Lee, 2006; Moon et al. 2004). The study by the Korea Consumer Protection Agency reported that 82.0% of the respondents were concerned about food safety, and only 13.5% of them considered the food safety system to be reliable. The study results also showed that 62.1% of the respondents were dissatisfied with food risk management performed by government regulators. The report stated that major food scares incidents in South Korea brought substantial financial damages due to declined food exports, increased distrust towards government, and damaged reputation of private food-processing firms (Nam and Kim, 2006). Food risk management in South Korea appears to be a challenging task for both government and private firms and it is imperative to explore Korean consumers' perception of FRMQ in order to

enhance the effectiveness of FRMQ in South Korea. The purpose of this study is to assess Korean consumers' perception and evaluation of food risk management quality (FRMQ) performed in the public and the private sectors. The purpose of this study is to evaluate Korean consumers' perception of the quality of food risk management in South Korea, in particular, how they differentiate their expectations towards government regulators and private firms' managers. Finding from the study may shed light on how to develop effective public and private FRM systems to be accepted by Korean consumers.

Methodology. This study adds to and builds upon the past studies (Frewer, 2007; Hughton et al., 2006; Van Kleef et al., 2007; Kim, 2012), which developed FRMQ model with 5 major constructs. The constructs were developed based on the comprehensive consumer survey study on 25 EU member countries in 2006. We decided to follow the pre-existing model in Van Kleef's study (2007) for our research and conducted a survey study in South Korea. Table 1 shows the 5 constructs: *Proactive consumer protection* (van Trijp et al., 2007); *Opaque and reactive risk management* (Houghton, 2007); *Scepticism in risk assessment and communication practices* (Krystallis et al., 2007; de Jonge et al., 2007); *Honesty of food risk managers* (Hovland et al., 1953); Expertise of food risk managers (Hovland et al., 1953) was considered to be a major construct which has impacts on food risk management quality.

Table 1. Definition of Constructs in the FRMQ model

Variables	Definition	Previous Studies
Proactive consumer protection (PCP)	Management systems that consumers perceive to be functioning with respect to food safety Consumer's perceptions of whether there is a system for controlling food risks Rapidly of response to food safety problems Efforts made to prevent food risks occurrence Efficient enforcement of food safety laws	E. Van Kleef et al., 2007; H. van Trijp et al., 2007
Opaque and reactive risk management (ORR)	Captures the concepts of responsiveness to food safety problems Negative measures taken or lack of management actions taken in food safety	J.R. Houghton, 2007
Skepticism in risk assessment and communication practices (SCEP)	Capture consumers' doubts about food safety assessment and the uncertainties surrounding it	A. Krystallis et al, 2007; J. de Jonge et al., 2007
Trust in honesty of food risk managers (TRUSTH)	The degree to which audience perceives the assertion made by a communicator to be the ones that the speaker considers valid	C.I. Hovland et al., 1953
Trust in expertise of food risk managers (TRUSTE)	The extent to which a food risk manager is perceived to be capable of making correct assertions	C.I. Hovland et al., 1953
Food Risk Management Quality (FRMQ)	Consumers' evaluation of the regulatory system to manage food hazards	E. Van Kleef et al., 2007; H. van Trijp et al., 2007

Source: Van Kleef et al., 2007; Kim, 2012.

To assess the Korean consumer perception of FRMQ by government and private firms, a survey was conducted, which was part of the SSK project⁴ "Globalization of Agri-Food Korea" at HYU KIFE. The questionnaire consisted of 33 questions, and 17 of them were selected for FRMQ modelling. The sample consisted of 322 respondents who were housewives and consumers who make purchasing decisions on food products. The data was collected via various channels, including financial service sector, healthcare sector, service industries and educational institutions. The respondents were primarily female (91.9%) as decision-makers for food purchase in a household are mostly female; 3 age groups can be established: 30s (34.2%), 40s (41.0%) and 50s (16.1%) represented the most of the sample. Average income of the respondents was 2000 USD per month; the largest group of the respondents (37.9%) had university education. Occupations of the respondents were reported to be: students (13.7%); salary-men/women (41.0%); professional workers (19.6%); housewives (7.8%) and others (6.2%). Overall, this respondent group appears to represent mid-income families with relatively high education, white-collar job and in their mid-30s and 40s.

The scale was developed based on Van Kleef's study (2007) and the items were selected through the exploratory factor analysis. In total, 33 items were collected in the survey study, and 17-item scale was chosen. Internal consistency of the scale was determined using Cronbach's alpha (Table 2). The reliabilities ranged from low (0.78) to high (0.94), which were considered to have acceptable internal consistency (Fornell and Larcker, 1981; Chin, 1998). Regarding the validity of the estimated models, all the scales had reliability in excess of the correlations between them (Table 3).

Table 2. Coefficients of Reliability for 6 Final Scales of Two Models

Variables	Cronbach's α	
	Government	Private Firms
Proactive consumer protection (PCP)	0.879	0.891
Opaque and reactive risk management (ORR)	0.881	0.865
Skepticism in risk assessment and communication practices (SCEP)	0.897	0.893
Trust I honesty of food risk managers (TRUSTH)	0.939	0.921
Trust in expertise of food risk managers (TRUSTE)	0.877	0.780
Food risk management quality (FRMQ)	0.849	0.849

Results. The proposed model (Table 1) was analyzed by structural equation analysis using AMOS 18.0. Path coefficients and standard errors for the model are reported in Figure 1 and Table 4. As shown in Figure 1, two separate FRMQ models were estimated for government and private firms. The estimated government-FRMQ model resulted in a chi-square of 623.35 (df = 299, p = 0.01), with a goodness of fit index (GFI) of 0.87. The root mean square residual (RMSEA) was 0.58. The estimated private firm-FRMQ model resulted in a chi-square of 702.01 (df = 354, p = 0.01), with a GFI of 0.87 and RMSEA of 0.55. The fit indices suggest that both models show a reasonable fit of data.

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Table 3. Correlations between constructs¹⁾

Variables	Average	Standardized	Correlations Between Constructs						
			1	2	3	4	5	6	
1. FRMQ	2.69	.86	1.00						
	2.69	.86							
2. PCP	2.96	.82	.56**	1.00					
	3.14	.90	.36**						
3. ORR	3.44	.79	-.42**	-.44**	1.00				
	3.21	.84	-.27**	-.42**					
4. SCEP	4.09	.92	-.28**	-.17**	.41**	1.00			
	4.10	.87	-.22**	.03	.10				
5. TRUSTH	3.49	.78	-.37**	-.40**	.72**	.50**	1.00		
	3.41	.74	-.36**	-.26**	.68**	.28**			
6. TRUSTE	3.15	.93	.38**	.47**	-.29**	.04	-.18**	1.00	
	3.44	.71	.26**	.30**	-.13**	.28**	.00		

¹⁾ Coefficients in the first line are the results for government model and the ones in the second lines are results for private firms.

The results for two models (government FRMQ vs. private firm FRMQ) were found to be significantly different. For government FRMQ, proactive consumer protection was found to be the most important determinant for government FRMQ as perceived by consumers. The second most important construct affecting Korean consumers' evaluation of government FRMQ was opaque and reactive RM. For private firm FRMQ, trust in expertise of FRM was the most important determinant, while skepticism in risk assessment and communication practice was the second most important & negative factor in determining perceived FRMQ of private firms. Regarding the statistical significance, all hypotheses except the 4th (trust in honesty) were found to be significant for government FRMQ model. In private firm FRMQ model, hypotheses 1 (proactive consumer protection), 3 (skepticism in risk assessment and communication practice) and 5 (trust in expertise) were found to be statistically significant.

At large, Korean consumers approach FRM in a rather pragmatic way. In considering the quality of FRM, they tend to expect specific action plans from government, and demand that government establish an early warning system to proactively protect consumers from food risks. Also, they consider transparency to be critical in their judgment for performance of government FRM.

On the other hand, Korean consumers seem to distrust the level of expertise of food marketers, as reflected in high coefficients of skepticism in risk assessment and communication practice & trust in expertise of food risk managers. In other words, Korean consumers lack confidence in private FRM systems. If private firms in the food industry aim to add value to their brands and reputation with a food risk management system, this needs to be clearly communicated to consumers. It implies that private firms may require to allocate sizable volume of resources on risk communication and advertisement of their FRM systems.

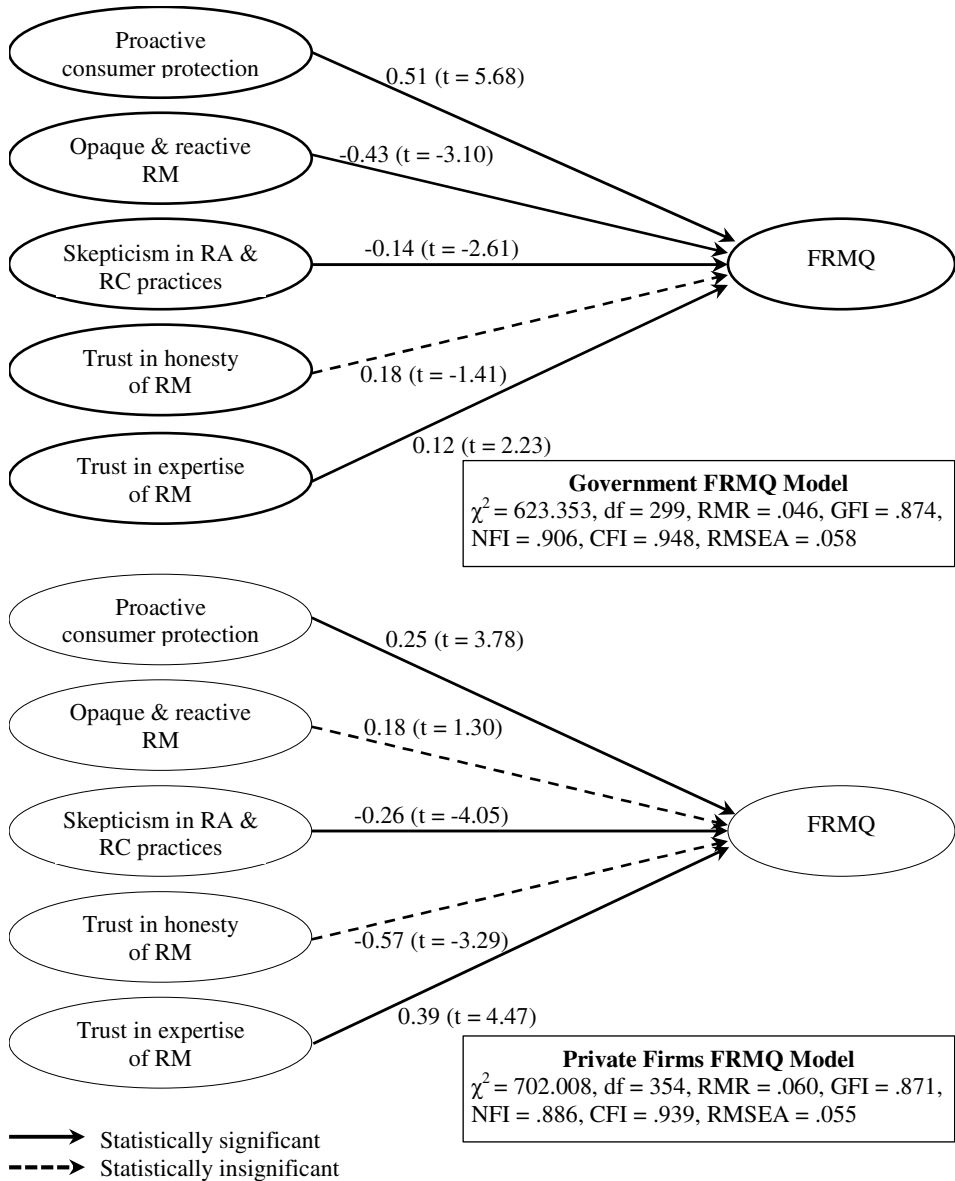


Figure 1. FRMQ Models for Government & Private Firms with Path Coefficients, developed by the authors

Conclusion. This study has assessed how Korean consumers develop attitude towards the quality of food risk management carried out by government and private firms in the food industry of South Korea. From this analysis, important determinants affecting the perceived performance of FRM by government and private firms were identified. Separate models for government FRM and private firm's FRM were developed and empirically estimated in order to explore whether Korean consumers differentiate their perception and evaluations on private and public systems. Also, the

assessment elicited different expectations which Korean consumers have for government and private firms in the food industry. The study developed 5 hypotheses based on Van Kleef's study (2007) and followed their modelling approach. This study is a meaningful addition to literature as it reports consumers' perception of FRMQ from Korean perspectives, and in particular, Korean consumers' attitude to FRM systems of government and private firms in the food industry.

Table 4. Standardized Estimates of Path Coefficients of the FRMQ Models, calculated by the authors

H	Path Relationship	Government		Private Firms	
		Coeff.	t-value	Coeff.	t-value
H1	PCP → FRMQ	0.51	5.68**	0.25	3.73**
H2	ORR → FRMQ	-0.43	-3.10*	0.18	1.30
H3	SCEP → FRMQ	-0.14	-2.61*	-0.26	-4.05**
H4	TRUSTH → FRMQ	0.18	1.41	-0.57	-3.29
H5	TRUSTE → FRMQ	0.12	2.23*	0.39	4.47**
Goodness of Fit Measures		$\chi^2 = 623.353$, df = 299, RMR = .046, GFI = .874, NFI = .906, CFI = .948, RMSEA = .058		$\chi^2 = 702.008$, df = 354, RMR = .060, GFI = .871, NFI = .886, CFI = .939, RMSEA = .055	

* p < 0.05, ** p < 0.01.

The findings suggest the following implications for policy-makers and food risk managers. First, Korean consumers have higher expectations towards government regarding proactive consumer protection issues and consider this to be a public issue. Thus, Korean government may need to develop an effective early-warning system for food risk management in order to have a proactive consumer protection measure. Second, opaque and reactive risk management was found to have statistically significant negative effect on Korean consumers' evaluation of government FRMQ, while having no statistically significant negative effect on FRMQ of private firms. Korea has a diversified government system of food risk management, which leads to limited efficiency in dealing with food scarce situations (Park, 2009). This heightened Korean consumers' distrust in the capability of government for food management. To resolve this issue, public policy makers may need to consider a revision of the current system for enhanced efficiency and synchronization of decision-making in food incidents. This may also facilitate more effective and rapid risk communication with media and the public when a major food risk outbreak occurs. Third, Korean consumers have negative views on risk assessment and risk communication performed by both government and private firms. In particular, consumers have a more negative view on private firms' risk assessment and risk communication practices. This implied that private firms in the food industry can no longer merely rely on government for food risk assessment and communication as conducted by the Korea Food and Drug Agency (KFDA). Korean consumers may expect additional layer of food risk assessment and communication by private companies. Private firms may consider this as an opportunity for raising value of their brands by implementing their private risk assessment system and by effectively communicating and advertising this to consumers. In future,

cost-benefit analysis of such a system may need to be explored for private firms to determine feasibility of such practice. Lastly, Korean consumers did not consider honesty of FRM to be a major issue for both government and private firms. Instead, expertise of food risk managers was found to have statistically significant impact on Korean consumers' attitude to FRMQ. These findings provide meaningful suggestions as for future development and improvement of FRMQ in South Korea.

As agri-food system becomes increasingly globalized and food products are actively traded worldwide, consumers in various countries are no longer immune to food risks that exist in foreign countries. South Korea in particular, has pursued open trade system and signed free trade agreement (FTA) with many of its trading partners. This implies that food risk management (FRM) systems in the trading partner countries are as important as the one at home. It may be necessary to compare and evaluate the difference in FRM of major trading partner countries, which may provide insights for development of an efficient global food supply chain and food risk management (FRM) system⁵.

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⁵ The SSK project "Globalization of Agri-Food Korea" at HYU KIFE has already the conducted assessment of Chinese consumers perception toward FRMQ of government and private firms in the food industry. The comparative analysis of Korean and Chinese assessment outputs would provide important implications for agri-food trade between these countries.

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