Implementation of Food Safety Management System in Thai Small and Medium Food Processing Enterprises: Institutional and Resource Dependence Perspective.

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Abstract

This study integrated institutional theory and resource dependence theory to construct a framework for analyzing the factors determining the implementation of food safety management systems (FSMSs) in food processing SMEs in Thailand in responding to the food safety pressures. A survey questionnaire was employed to probe a sample of Thai food processing SMEs. The standardized questionnaire was mailed to managers who were responsible for food safety in 820 such firms. The 195 valid questionnaires were returned (23.8 percent response rate). The findings revealed that the FSMSs implementation by Thai food processing SMEs can be predicted by (1) expected social legitimacy to be gained from the implementation, (2) top management commitment to implementing FSMSs, (3) the extent of FSMSs implemented by competitors, (4) the exchange of food safety knowledge and information between firm and other organizations within food industry, and (5) firm size in terms of employee numbers. The results suggested that government should disseminate food safety management knowledge and practices particularly to top management of food processing SMEs, and the top management should be aware of the potential benefits as well as the importance of the implementation of a suitable FSMS in their firms. In addition, government should direct its attention and resources towards the smaller food processing firms.

Keywords: Small and medium enterprise, food safety management system, institutional theory, resource dependence theory

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การนำระบบการจัดการความปลอดภัยของอาหารมาใช้ในอุตสาหกรรมแปรรูปอาหารขนาดกลางและขนาดย่อมในประเทศไทย: แนวคิดสถาบันและการพึ่งพาทรัพยากร

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บทคัดย่อ

งานวิจัยนี้ได้บูรณาการทฤษฎีสถาบันและทฤษฎีการพึ่งพาทรัพยากรมาพัฒนาเป็นกรอบแนวคิดในการศึกษาปัจจัยที่เป็นแรงกดดันต่ออุตสาหกรรมแปรรูปอาหารขนาดกลางและขนาดย่อมในประเทศไทยในการนำระบบการจัดการความปลอดภัยของอาหารมาใช้ เครื่องมือที่ใช้ในการเก็บรวบรวมข้อมูลคือ แบบสอบถาม ซึ่งได้ส่งไปถึงผู้รับผิดชอบงานด้านความปลอดภัยของอาหารในโรงงานอุตสาหกรรมแปรรูปอาหารขนาดกลางและขนาดย่อมทั่วประเทศจำนวน 820 แห่ง แบบสอบถามที่ได้รับตอบกลับมาและมีความสมบูรณ์มีจำนวน 195 ฉบับ (คิดเป็นอัตราการตอบกลับร้อยละ 23.8) ผลจากศึกษาพบว่า ปัจจัยที่ส่งผลการนำระบบการจัดการความปลอดภัยของอาหารมาใช้ในอุตสาหกรรมแปรรูปอาหารขนาดกลางและขนาดย่อมในประเทศไทย ได้แก่ 1) การยอมรับทางสังคมที่คาดว่าจะได้รับ 2) ความมุ่งมั่นของผู้บริหาร 3) การนำระบบการจัดการความปลอดภัยของอาหารมาใช้ของคู่แข่ง 4) การได้รับความรู้และข้อมูลข่าวสารเกี่ยวกับการจัดการความปลอดภัยของอาหาร และ 5) ขนาดกิจการ ข้อค้นพบจากการศึกษาดังกล่าวเสนอแนะในเชิงนโยบายได้ว่า หน่วยงานของรัฐควรให้ความรู้และข้อมูลข่าวสารเกี่ยวกับความปลอดภัยของอาหารและความเข้าใจถึงประโยชน์ของการมีระบบการจัดการความปลอดภัยของอาหารแก่กิจการอุตสาหกรรมแปรรูปอาหารขนาดกลางและขนาดย่อม โดยเฉพาะอย่างยิ่งให้กับผู้บริหาร และควรให้การสนับสนุนกิจการอุตสาหกรรมแปรรูปอาหารขนาดเล็กที่มีเงินทุนที่จำกัดในการพัฒนาระบบการจัดการความปลอดภัยของอาหาร

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Introduction

Small and medium sized enterprises (SMEs) are playing an increasingly important role in the national economics by providing job opportunities, enhancing exports of the country, and supplying goods to other manufacturing industries (Deros et. al., 2006). In Thailand, there were totally 2,781,945 SMEs at the end of 2012.They employed 11,783,143 people or 80.4 percent of overall employment. In 2012, the GDP value of Thai SMEs was 4,211,262.7 million baht, or 37.0 percent of the country's GDP, within this amount GDP value of food SMEs was 224,478.6 million baht (OSMEP, 2013).

Thailand is one of the world leading exporters of food and agricultural products. However, Thai food processing firms are facing important problems in quality and safety of their products and their ability to comply with both national and international regulations, particularly SMEs due to lack of knowledge, skills and resources. The consumption of unsafe food can cause many acute and life-long diseases, ranging from diarrhea to various forms of cancer. World Health Organization (WHO) estimates that foodborne and waterborne diarrhoea diseases kill 2.2 million people annually, and more than 1,303,921 Thai people were reported to be ill from foodborne pathogens in food in 2011 (Department of Disease Control, 2012). Meanwhile, the international requirements for food hygiene standards such as the international Codex Alimentarius Commission Standards from the main consumers of Thai produce (USA, Europe and Japan) have raised awareness of food safety among food processing firms. These incidents have resulted in an increasing pressure from rapidly growing demand by consumers, public organizations, the government, and other stakeholders that Thai food processing firms produce safe food.

To be able to produce safe foods, it is recommended that a suitable food safety management system (FSMS) must be implemented. Food safety refers to the conditions and practices that preserve the quality of food to prevent negative health effects on the final consumer. Accordingly, the incorporation of a suitable FSMS into their policies has become a necessity for food processing firms. Currently, however, there are wide variations in the implementation of FSMS among SMEs in Thai food processing industry. Some SMEs integrate FSMS proactively into their firm's overall

strategies in order to be able to compete more effectively, whereas others view FSMS as a burden and try to reduce costs by avoiding compliance with existing regulations. In order to be able to understand thoroughly how to support effective implementation of FSMS, it is necessary to understand the factors that influence the decisions of the firms to implement their FSMS. Unfortunately, very little research has been done to gain the such understanding in small and medium sized food processing firms and, however, existing studies that do analyze factors influencing FSMS implementation fail to give coherent theoretical explanation of organizational responsiveness to pressures for food safety.

Therefore, this study was intended to determine factors that influence the level of FSMS implementation in SMEs in Thai food processing industry by using an integrated two complementary organizational theories, institutional theory and resource dependence theory.

Theoretical Background

Food Safety Management System

Food safety management system (FSMS) refers to a set of interrelated or interacting elements that combine to ensure that food does not have adverse health effects on consumers. These elements include policies, plans, procedures, practices, processes, objectives, improvements, controls, information, responsibilities, relationships, suggestions, motivations, and resources. Several studies have identified factors influencing on FSMS implementation such as anticipation of quality improvement, customer complaint reduction, and product wastage reduction from the implementation (Deodhar, 2003); top management commitment, building infrastructure, training and education, appropriate attitude (Sohrab, 2000); firm' s size (Gormley, 1995; Mortlock et. al., 1999); number of employees (Panisello et. al., 1999).

Institutional Theory

Institutional theory studies organizational responses to institutional pressures. Institutions exerting institutional pressures include regulatory and governmental

agencies, interest groups, laws, courts, consultants, professions, and other organizations (DiMaggio & Powell, 1983: 147-160). According to institutional theory, organizations are likely to respond institutional pressures consciously or unconsciously in order to acquire legitimacy, stability, supports and resources necessary for survival. In respond to the pressures, they are likely to move toward similar structure and practices on the basis of what are legitimate and acceptable within an organization field (Meyer & Rowan, 1977: 340-363; Scott & Meyer, 1983: 129-155). DiMaggio and Powell (1983: 147-160) suggest that there are three institutional forces that pressure firms to be similar. These forces are coercive, normative, and mimetic forces.

Coercive force refers to demands and pressures that are exerted by other organizations on an organization upon which it is dependent upon such as government, trade associations, or other bodies with regulatory power over the organization. Food safety laws and regulations are examples of coercive institutional pressures. Food processing firms are forced to comply with the pressures.

Mimetic force is described as imitation (DiMaggio & Powell, 1991: 183-203). Organizations are likely to adapt their structures and practices to those of other organizations that are perceived to be legitimate or beneficial. Regarding to the food safety management, food processing firms are likely to imitate food safety practices implemented by their competitors in order to gain legitimacy and competitiveness benefits.

Normative force is described as force originating from professional norms and standards within a field DiMaggio and Powell (1983: 147-160). Organizations are likely to conform to normative standards in order to gain legitimacy, stability, support, and resources necessary for survival (Proenca et. al., 2000). Food safety norms and standards such as HACCP, GMP, and international food safety standards (ISO 22000) are widely implemented among food processing firms in the food industry field. Food processing firms are likely to conform food safety norms for survival.

Resource Dependence Theory

Resource dependence theory studies how the dependence of an organization on the external environment for resources influences organizational adaptation. To be able to get resources, however, organizations do not merely adapt to comply with environmental demands but, instead, implement variety of strategies in order to suit an organization's objectives. External environments, such as stakeholders, who possess resources needed by organizations are important to the organizations. And their importance is a function of the attribute of the resources they possess as perceived by the organizations. For instance, shareholders and creditors are likely to be the important sources of critical funds, and customers are likely to be the important source of revenues.

Strategies in Response to the Food Safety Pressures

Institutional theory and resource dependence theory are complementary (Oliver, 1991: 145-179) and have greater predictive power when used together (Sherer & Lee, 2002). Both theories explain that organizations are likely to respond environmental pressure for survival. However, the role of the organization in responding to the pressures regarding to each theory is different. While institutional theory largely suggests passive compliance in response to the environmental demands, resource dependence argues that organizations may also engage in more active management of the environment. Accordingly, an integration of these two theories suggests that organizations can develop a variety of strategies in response to the food safety pressures. Regarding to food safety management, FSMS that food processing firms implement in response to external pressures may be a strategy of proactive strategy acquiescence, compromise, or avoidance (Oliver, 1991: 151).

Proactive Strategy: Food processing firms may choose to become food safety leaders by developing and implementing food safety initiatives beyond the current food safety rules and regulations and other demands.

Acquiescence: Food processing firms may comply with food safety rules and regulations in order to elevate their legitimacy and protect them from public criticism and the financial penalties of noncompliance.

Compromise: Food processing firms may be confronted with conflicting stakeholder demands such as the conflict between consumer expectations that demand firms to minimize food safety hazard and firm objectives that try to minimize their cost. Therefore, for example, firms may tend to conform to at least the minimum expectations of food safety regulation required by the consumers.

Avoidance: Food processing firms may ignore food safety regulation and demands particularly, when the potential for law enforcement of government agencies or other food safety pressures are perceived to be low.

Hypotheses

This study posits that the levels at which SMEs in food processing implement FSMS to respond to environmental pressures will depend on three primary factors, namely: motivation factor; contextual factor; and organizational characteristics. Within the three factors, hypotheses were developed on the basis of institutional forces and organizational dependency integration.

Motivation Factor

Several studies identified motives for food safety responsiveness to external pressures; these include regulatory compliance, market forces, stakeholder expectations, and top management initiative and commitment (Buzby, 2001; Loader & Hobbs, 1999). In response to the pressures, food processing firms are motivated to implement food safety management in order to gain social legitimacy and economic and competitiveness benefit (Deodhar, 2003). Therefore

H1: The higher the expected social legitimacy to be gained from implementation of a FSMS by a small and medium-sized food processing firm, the higher its implementation level of a FSMS.

H2 : The higher the expected economic and competitiveness benefit to be gained from implementing of a FSMS by a small and medium-sized food processing firm, the higher its implementation level of a FSMS.

Food processing firms are likely to implement FSMS in response to expectations of stakeholders, and the implementation will depend on the perception of the importance of those stakeholders to the firm. Generally, there are two groups of stakeholders: internal stakeholders (employees, shareholders) and external stakeholders (customers, government agencies, suppliers). Therefore:

H3a: The higher the importance of internal stakeholders as perceived by a small and medium-sized food processing firm, the greater its implementation level of a FSMS.

H3b: The higher the importance of external stakeholders as perceived by a small and medium-sized food processing firm, the greater its implementation level of a FSMS.

The motives of the implementation also come from top management (Sohrab, 2000) as commitment from top management can ensure that appropriate resources are invested in food safety management efforts. Therefore:

H4: The higher the level of top management commitment is to food safety implementation in a small and medium-sized food processing firm, the higher is the level implementation of a FSMS.

Contextual Factors

Once a significant number of firms in an industry field have implemented a particular practice in response to institutional pressures, the practice is likely to become a norm; then other firms may perceive resistance to implementation as a risk to the organization's legitimacy and their ability to secure resources (DiMaggio & Powell, 1983: 147-160).

Regarding to food safety management, food processing firms are likely to implement FSMS when there are more food processing firms have already implemented FSMS. Therefore:

H5: The higher the level of FSMS implemented by other SMEs food processing, the higher is the implementation of a FSMS by a small and medium-sized food processing firm.

Interconnectedness is the number of connections between individuals within an organizational field. Through these connections, organizations are socialized to accept institutional norms and expectations (DiMaggio & Powell, 1983: 147-160; Pfeffer & Salancik, 1978). When food safety knowledge and practices have been transferred to the firms through the connection and relation with others in the food industry field, firms are likely to accept the information and implement food safety practices. Therefore:

H6: The higher the degree of interconnectedness of a small and medium-sized food processing firm, the higher is its level of implementation of a FSMS.

Organizational Characteristics

Since larger organizations are more visible and accountable to various stakeholders, they are more likely to be under greater pressures to maintain their social legitimacy by conforming to external expectations (Miles, 1987). Larger food processing firms are more likely to be under greater pressures from stakeholders to produce safe food. Accordingly, they are more likely to implement FSMS. Therefore:

H7: The higher the firm size of a small and medium-sized food processing firm, the higher is its level of implementation of a FSMS.

Organizations are more likely to conform to expectations of their stakeholders when the expectations are congruent with their goals and policies (Oliver, 1991: 163). International markets expect that exporting firms develop and implement the FSMS, such as the ISO 22000 standards for the EU market. An important policy of food exporting firms is to implement FSMS in order to be able to gain access to foreign markets. Therefore:

H8: The higher the percentage of export sales of a small and medium-sized food processing firm, the higher is its level of implementation of a FSMS.

Methodology

Data Collection and Sample.

This study is principally based upon a sample survey of food processing firms. Small and medium food processing were used as the population. The unit of analysis was individual firms and a sample was drawn from food manufacturing firms listed in the TISC (Thailand Standard Industrial Classification) code 31 that are small and medium manufacturing enterprises or have fewer than 200 employees (as defined by Office of Small and Medium Enterprises Promotion) which totaled 1,955 firms.

A mail questionnaire was used to collect data. The questionnaire was developed in a three-stage process. First, the questionnaire was initially theory-based designed. This version was reviewed by food safety experts. Second, the initial questionnaire was modified to accommodate the food safety experts' comments and suggestions. The new version was reviewed by food safety managers in small and medium food processing firms. Third, a final version of the questionnaire was designed, drawing on their feedback, and mailed to sample firms. The questionnaire was sent to 820 sampled firms using stratified random sampling technique. Respondents were quality assurance managers or production managers who were presumably familiar with food safety management in their firms. The 195 valid questionnaires were returned yielding a response rate of 23.78 percent. Stepwise multiple regression, which is used to test the hypothesis in this study, requires that the minimum ratio of valid cases to number of independent variables be at least 15-20 to 1 (Hair et. al., 1995: 105). In this study, the ratio of valid cases (195) to number of independent variables (9) was 21.7 to 1, which was greater than the minimum ratio. Therefore, 195 valid cases were enough to permit the hypothesis testing using stepwise multiple regression.

In addition, field research consisting factory visits and on-site personal interviews were used to supplement and extend the findings of the survey research. The interviews were conducted with quality assurance managers and/or production managers of 14 SMEs in food processing to obtain data on their food safety practices and factors in FSMS adoption such as organizational characteristics as well as regulatory compliance,

competitive conditions, and other motivational factors. Sites were selected to account for different sizes of plants in different locations.

Operationalization of Variables

Dependent variables. The level of FSMS implementation was defined as the extent to which a small and medium-sized food processing firm executed the food safety management practices.

Table 1. Dependent Variable and Measurement

Variable	Meaning	Dependent variable Measurements
FSMS implementation	The extent to which a firm implements food safety management activities in response to environmental pressures.	Mean of scores for agreement on: - firm has a clear policy on FSMS. - firm has a clear plan for a FSMS. - firm continuously acquires news and information of the FSMS. - firm encourages employees to attend the food safety training workshops consistently. - firm uses teamwork to analyze and solve food safety management problems. - firm distributes authority and responsibility in FSMS within the firm. - firm appropriately motivate employee to attain food safety management goals. - firm has food safety control system to ensure that its products are in compliance with food safety quality standards. - firm has a process for reviewing FSMS improvement. - firm regularly collects information on important food safety related from its customers. - firm consistently uses customer suggestions for improving its food safety management.

Independent variables. Nine independent variables were defined as followed.

1) Expected gain of social legitimacy was defined as the extent of expected social legitimacy to be gained from implementation of a FSMS.

2) Expected gain of economic and competitiveness benefit was defined as the extent of expected economic and competitiveness benefit to be gained from implementation of a FSMS.

3) Perceived importance of internal stakeholders was defined as the extent of importance of internal stakeholders as perceived by a small and medium-sized food processing firm.

4) Perceived importance of external stakeholders was defined as the extent of importance of external stakeholders as perceived by a small and medium-sized food processing firm.

5) Top management commitment was defined as the extent to which top managers commit to implementing FSMS.

6) Extent of FSMS implemented by other food processing firms was defined as the extent to which competitors were aware of and implemented FSMS.

7) Degree of interconnectedness was defined as the extent to which food safety knowledge and information were exchanged between firms and other organizations within food industry.

8) Percentage of export sales referred to the percentage of export sales of a small and medium-sized food processing firm.

9) Firm size referred to number of employees.

Table 2. Independent Variables and Measurements.

Variables	Meaning	Independent Variables Measurements
Expected gain of social legitimacy	The extent of expected social legitimacy to be gained from implementation of a FSMS.	Mean of scores for expectation of: - better firm image. - better firm reputation.
Expected gain of economic and competitiveness benefit	The extent of expected economic and competitiveness benefit to be gained from implementation of a FSMS.	Mean of scores for expectation of: - benefits outweighing costs. - better product quality. - better product image. - reduction in the number of customer complaints about product quality. - reduction in the number of product returns due to defective product. - reduction in cost and waste in production.
Perceived importance of internal stakeholders	The extent of importance of internal stakeholders as perceived by a food processing SME.	Mean of scores for the importance of: - employees. - suppliers.
Perceived importance of external stakeholders	The extent of importance of external stakeholders as perceived by a food processing SME.	Mean of scores for the importance of: - customers. - government agencies. - newspapers, radio and television. - communities.
Top management commitment	The extent to which top managers commit to implementing FSMS.	Mean of scores for the degree of top management contribution of: - time. - money.

Variables	Meaning	Independent Variables Measurements
FSMS implemented bycompetitors	The extent to which competitors implement FSMS.	Mean of scores for the extent to which: - competitors are aware of food safety. - competitors implement FSMS.
Interconnectedness	The extent to which food safety knowledge and information were exchanged between firm and other organizations	Mean of scores for: - the level of attendance in food safety seminar. - the amount of food safety information obtained from government agencies. - the amount of food safety information obtained from food producer organizations. - the amount of food safety information obtained from food safety consultants. - the amount of food safety information obtained from professional journals.
Firm Size	The number of employees.	The number of employees.
Percentage of Export Sales	The percentage of export sales.	The percentage of export sales of a processingfirm.

For the dependent variable and the first seven independent variables as described above, respondents were asked to respond to each statement in terms of their degree of agreement using 5-point Likert scales ranging from 1 (strongly disagree) to 5 (strongly agree). The ratings or means of the scale were descriptively distributed as 1.00-1.50 = very low, 1.51-2.50 = low, 2.51-3.50 = average, 3.51-4.51 = high, and 4.51-5.00 = very high.

Instrument Validation

Construct Validity. Construct validity is the extent to which a particular item relates to other items consistent with theoretically derived hypotheses concerning the variables that are being measured. The construct validity of the research variables was examined using factor analysis.

Because the critical assumptions underlying factor analysis are more conceptual rather than statistical, two measures must be considered to ensure that the data matrix has sufficient correlations to justify the application of factor analysis (Hair et al., 1995: 374). The first measure is the analysis of measures of sampling adequacy (MSA). The measure is to quantify the degree of intercorrelations among the variables and the appropriateness of factor analysis. Generally, the index ranges from zero to one. Table 3 shows that the measure of sampling adequacy is reaching one (.89) which indicates that each variable is perfectly predicted without error by the other variables (Hair et al., 1995: 374). A second measure is the Bartlett test of sphericity. It is a measure for testing the presence of correlations among variables. Table 3 also shows chi-square 4776.90 and indicates that the correlation matrix has significant ($p = .000$) correlations among at least some of the variables (Hair et al., 1995: 374). Therefore, factor analysis can be appropriately used.

Table 3. Factor Analysis

	FSMS implementation	Expected economic benefit to be gained	Interconnectedness	Perceived importance of external stakeholders	Top management commitment	FSMS implemented by competitors	Expected social legitimacy to be gained	Perceived importance of internal stakeholders
Firm has food safety control system to ensure that its products are in compliance with food safety quality standards.	.84							
Firm has a clear plan for a FSMS.	.83							
Firm distributes authority and responsibility in FSMS within the firm.	.83							
Firm uses teamwork to analyze and solve food safety management problems.	.82							
Firm has a process for reviewing FSMSs improvement.	.80							
Firm encourages employees to attend the food safety workshops consistently.	.76							
Firm has a clear policy on FSMS.	.74							

FSMS implementation	Firm continuously acquires news and information of the FSMS.	.74
	Firm consistently uses customer suggestions for improving its FSMS	.68
	Firm regularly collects information on food safety related from its customers.	.67
Expected economic benefit to be gained	Firm appropriately motivate employee to attain food safety management goals.	.58
	Reduced number of complaints from customers on product quality.	.83
	Reduced number of returned products from customers due to bad quality.	.82
Interconnectedness	Improvement of the product's image.	.75
	Improved quality.	.74
Perceived importance of external stakeholders		
Top management commitment		
FSMS implemented by competitors		
Expected social legitimacy to be gained		
Perceived importance of internal stakeholders		

	FSMS implementation	Expected economic benefit to be gained	Interconnectedness	Perceived importance of external stakeholders	Top management commitment	FSMS implemented by competitors	Expected social legitimacy to be gained	Perceived importance of internal stakeholders
Reduced cost and waste in production.	.73							
Benefits outweighing costs.	.58							
The amount of food safety information received from food producer organizations.		.73						
The amount of food safety information received from government agencies.		.73						
The level of attendance in food safety conferences.		.67						
The amount of food safety information received from professional journals.		.60						
The amount of food safety information received from food safety consultants.		.59						
Community stakeholders.			.80					
Suppliers.			.77					
Government agencies.			.69					
Customers.			.56					

	FSMS implementation	Expected economic benefit to be gained	Interconnectedness	Perceived importance of external stakeholders	Top management commitment	FSMS implemented by competitors	Expected social legitimacy to be gained	Perceived importance of internal stakeholders
The extent to which management contributes time.				.69				
The extent to which management contributes money.				.62				
The extent to which competitors implement FSMS.					.89			
The extent to which competitors are aware of food safety.					.86			
Better public recognition.							.70	
Better company reputation.							.69	
Shareholders.								.80
Employees.								.80
Eigen values	7.59	4.66	2.97	2.50	2.06	1.90	1.82	1.70
%o f variance	21.09	12.95	8.26	6.96	5.73	5.28	5.06	4.73

Kaiser-Meyer-Olkin Measure of Sampling Adequacy. = .89 Bartlett's Test of Sphericity: Approx. Chi-Square = 4776.90, df = 630, Sig. = .000

As shown in Table 3, a factor analysis with varimax rotation on 35 items used to measure research variables, as expected, revealed eight factors with Eigen value greater than 1.0 (7.59, 4.66, 2.97, 2.50, 2.06, 1.90, 1.82 and 1.70). All the factor loadings were also greater than the cutoff point of .5, as recommended by Nunnally (1978).

Reliability or internal consistency. Reliability refers to the degree of dependability, consistency or stability of a scale. It reflects the scale's ability to consistently yield the same responses. Testing for the reliability of the measures is an important consideration in any study. Measurement of a variable must be reliable to be useful and yield stable results. Cronbach's coefficient alpha is a widely used measure of scale reliability. Typically, an alpha coefficient of .70 or above is considered to be acceptable (Cronbach, 1951: 297-334; Nunnally, 1978).

As shown in Table 4, the Cronbach's alpha for each scale in this study was above the recommended value of .70, indicating that the scales had sufficient internal reliability.

Table 4. Cronbach's alpha Coefficient

Scale	Coefficient
Dependent variable:	
- Level of FSMS implementation	.95
Independent variables:	
- Expected social legitimacy to be gained	.91
- Expected economic and competitiveness benefit to be gained	.88
- Importance of internal stakeholders as perceived by firm	.75
- Importance of external stakeholders as perceived by firm	.77
- Top management commitment	.83
- FSMS implemented by competitors	.86
- Interconnectedness	.76

Data Analysis

Descriptive Statistics for Research Variables

The results of descriptive statistical analysis showed that respondent firms implemented FSMS at an apparently high level. Respondent firms highly expected that they would gain social legitimacy and economic and competitiveness benefit from their existing FSMS, they highly perceived that both internal and external stakeholders were important and had influences on food safety management decisions of the firms, they highly acquired food safety knowledge and practices from various sources, they recognized that their competitors implement moderate level of FSMS and top management of the respondent firms highly committed to FSMS implementation. In addition, average number of employees of the respondent firms was 132 and average percentage of their export sale was 35.23.

Table 5. Descriptive Statistics and Correlation Matrix

	Mean	SD	1	2	3	4	5	6	7	8	9	10
1. Expected social legitimacy to be gained.	3.98a	.70	1									
2. Expected economic and competitiveness benefit to be gained.	4.20a	.67	.56**	1								
3. Importance of internal stakeholders as perceived by firm.	4.30a	.53	.40**	.44**	1							
4. Importance of external stakeholders as perceived by firm.	4.25a	.53	.45**	.44**	.39**	1						
5. Top management commitment.	3.67a	.84	.40**	.41**	.25**	.32**	1					
6. FSMS implemented by competitors.	3.88a	.69	.35**	.24**	.22**	.22**	.27**	1				
7. Interconnectedness.	3.31a	.67	.22**	.35**	.23**	.35**	.42**	.23**	1			
8. Firm size (number of employees).	132	87.90	.06	.08	-.05	.08	.04	.11	-.04	1		
9. Percentage of export sales.	35.23	30.46	-.10	.00	.01	.02	.05	.08	.14*	.14*	1	
10. Level of FSMS implementation.	3.98a	.70	.46**	.43**	.26**	.37**	.65**	.36**	.45**	.12	.07	1

[a] Five-point Likert-Scale. (1 for lowest 5 for highest level)

* $p < .05$

** $p < .01$

Hypotheses Testing

This study used stepwise multiple regression analysis to test the hypothesis. Since the presence of multicollinearity can distort the predictive power of the regression model (Hair et al., 1995). Multicollinearity is a problem that occurs with regression analysis when two or more predictor independent variables are highly correlated. Correlation matrix and variance inflation factors (VIF) are generally used to determine the impact of multicollinearity. The partial correlation matrix indicated that there were no high correlation among the independent variables (Table 5), and the VIF value and Tolerance Index were less than 10 and greater than .1 respectively (Table 6) which suggested that there was no significant multicollinearity (Hair et al., 1995: 127).

Table 6. VIF Value and Tolerance Index

Variable	Collinearity Statistics	
	Tolerance	VIF
Expected social legitimacy to be gained.	.55	1.81
Expected economic and competitiveness benefit to be gained.	.56	1.77
Importance of internal stakeholders as perceived by firm.	.72	1.37
Importance of external stakeholders as perceived by firm.	.65	1.52
Top management commitment.	.68	1.47
FSMS implemented by competitors.	.81	1.22
Interconnectedness.	.72	1.37
Firm size.	.95	1.04
Export sales.	.93	1.06

The stepwise regression analysis showed that five (H1, H4, H5, H6 and H7) out of the nine hypotheses were supported. All parameter coefficients had positive values. The model was statistically significant and 52 percent of the variance in the dependent variable can be explained by the independent variables (adjusted R-square = .52; $F = 42.93$, $p < .000$). (Table 7)

Table 7. Summary of Stepwise Multiple Regression Analysis

Variables	Coefficient	t
Constant.		-2.06*
Expected social legitimacy to be gained.	.18	3.20*
Top management commitment.	.45	7.68**
FSMS implemented by competitors.	.11	1.99*
Interconnectedness.	.18	3.38**
Firm size.	.11	2.30*
Adjusted R Square	.52	
F-statistic	42.93	

* p<.05

** p< .01

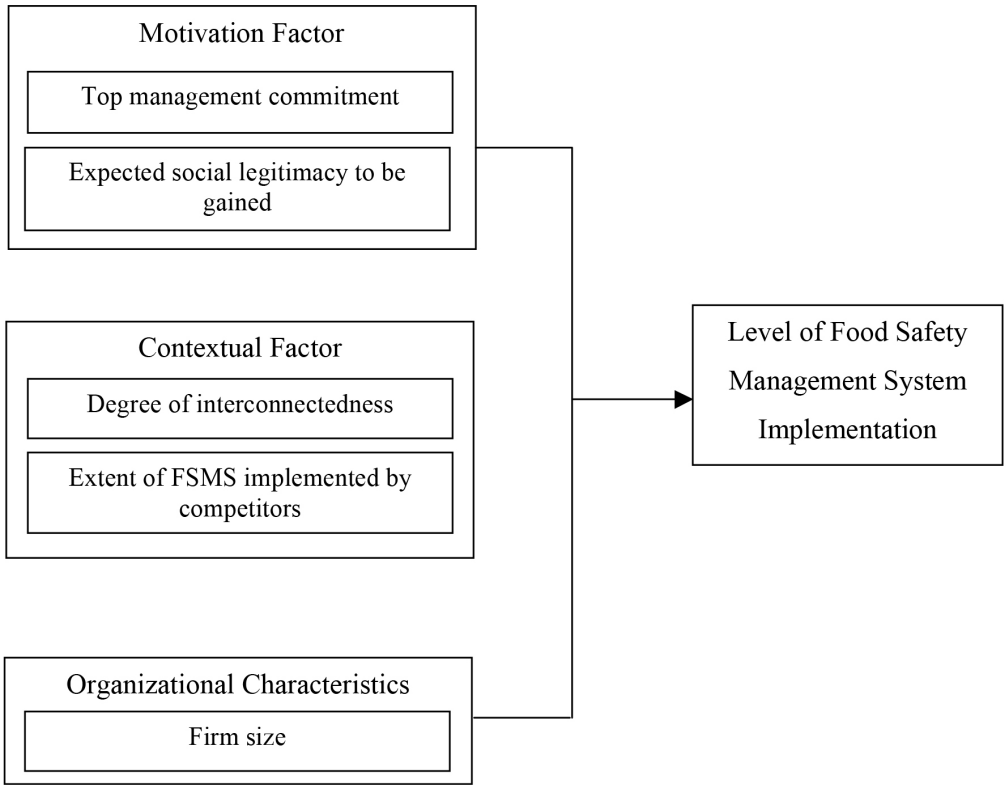

Figure 1. A Model of Food Safety Management System Implementation in Thai Small and Medium Food Processing Enterprises. (A Tested Model)

Results and Discussion

The results of the hypotheses testing revealed that the level of FSMS implementation was significantly determined by five factors. The most influence factor was top management commitment to FSMS implementation, followed by degree of interconnectedness, expected legitimacy to be gained from FSMS implementation, firm size and extent of FSMS implementation by competitors respectively. The more top management committed to implementing food safety management, the greater the implementation level of a suitable FSMS. This findings correspond with those of Sohrab (2001), and are consistent with the previous study that the decision making process in an organization is made by top management (Oliver, 1991: 145-179). The results also showed the interconnectedness or extent to which food safety information and knowledge were exchanged between firm and other organizations through attending food safety seminars and being a member of food safety organizations affect the implementation of the FSMS. Other result revealed that firms are also likely to implement a FSMS to comply with food safety standards to gain legitimacy, such as enhanced recognition and reputation (DiMaggio & Powell, 1983: 147-160). This result is consistent with previous studies which suggest that organizations are motivated to comply with institutional norms and pressures in order to be able to gain their legitimacy and to avoid sanctions for noncompliance (Goodstein, 1994: 350-382; Ingram & Simons, 1995: 1466-1482). Another results indicated that firm size was found to have an influence on the likely implementation of a FSMS. This finding supports previous research that larger organizations are likely to implement FSMS (Fairman & Yapp, 2004; Gormley, 1995; Mortlock et al., 1999). Finally, the study also indicated that there was a relationship between the level of food safety management implementation and the extent of the FSMS implemented by other food processing firms. This finding supports the institutional perspectives that organizations are forced to be similar by institutional forces (DiMaggio & Powell, 1983: 147-160).

Information from the field study also showed that firms with top management who commit to food safety management and have higher education were more likely to adopt FSMS and a lack of food safety information is an obstacle to FSMS adoption.

In addition, smaller firms involved in the field study held limited resources. They did not want to invest in food safety practices unless it was mandated and did not require high cost.

Managerial and Policy Implication

The findings as discussed earlier can suggest both managerial and policy implications. The findings that top management commitment and interconnectedness had a positive influence on FSMS implementation, and that government was one of the primary sources of food safety information and knowledge suggested that government should disseminate the information and knowledge to top management of SMEs in food processing industry, and the top management should be aware of the potential benefits as well as the importance of the implementation of a suitable FSMS in their firms. These findings have important implications for future research on knowledge dissemination strategy. That is, future research should examine what and how government or related organization disseminate knowledge concerning food safety among SME food processing firms so as to enhance them implement better food safety practices.

Another finding that smaller SMEs food processing that had limited resources were less likely to implement FSMS can suggest that the government should direct its attention and resources towards the smaller SMEs food processing that lack the required resources for implementing FSMS. In addition, the findings from the qualitative study suggest that government 1) use incentives to encourage SMEs food processing to adopt FSMS and subsidize their efforts in FSMS implementation through grants, loans, tax credits and electricity cost reduction; and 2) accelerate the adoption by recognizing and rewarding firms that move beyond compliance in their enforcement of regulations.

Conclusion

Based on an integration of the institutional and resource dependence theory, this study has shown the factors influencing FSMS implementation in SMEs food processing. This study generally support the contention that organizations do not

respond uniformly to institutional pressures, but rather adopt varying strategies that depend on the nature of institutional pressures forced on them (Oliver, 1991: 145-179) and that degree of conformity is a strategic choice that depends on the nature of the pressures, as well as on organizational interests in maintaining legitimacy and support viability (Dowling & Pfeffer, 1975: 122-136). The findings indicated that top management commitment, degree of interconnectedness, expected legitimacy to be gained from FSMS implementation, firm size, and extent of FSMS implementation by competitors were factors that influenced SMEs in Thai food processing implement FSMS.

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