AN INVESTIGATIVE STUDY INTO THE HAZARD ANALYSIS OF CRITICAL CONTROL POINT (HACCP) IMPLEMENTATION IN SMALL AND MEDIUM-SIZED FOOD MANUFACTURING ENTERPRISES (SMEs)

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ABSTRACT

This study investigates the Malaysian food SMEs' main motive in implementing the system. It also assesses the effectiveness of the system's implementation in the SMEs through the managements' and employees' commitment and the benefits of the system to the companies' productivity. Sample populations were selected among the food SMEs that had implemented HACCP in the Klang Valley area. The face-to-face interview approach among the representative managers provided truly significant and in-depth information and it was found that the 'customer requirement' was the major motive of food SMEs in implementing HACCP, outnumbering the other motives identified. The managements' and employees' commitment after HACCP implementation were fairly satisfactory and HACCP offered numerous benefits for the companies' productivity despite a few obstacles encountered during the implementation. Employees claimed that they were satisfied with the management's commitment and were committed to their jobs after HACCP took place in their organization. Productivity experienced considerable improvement from HACCP implementation and the overall findings clearly indicate that HACCP is a good food safety system, and it is worthwhile for the other food SMEs to invest in its implementation.

Keywords: Food Quality, Food Safety, HACCP, Food SMEs

INTRODUCTION

Global society is experiencing a gradual awakening of food consciousness, particularly of its quality and safety. Over the passage of time, changes in the philosophy of, approach to and preparation of food are forcing the food industry to use new ideas to maintain food quality and safety standards, yet meet the needs of society. As with other countries, food safety is becoming an

important issue in Malaysia for several reasons, such as consumer awareness and the outbreak of food borne illnesses (Selamat, Shamsudin and Dulatti, 2003). However, before discussing the issue, it is important to start with the definition of the words 'SME' in the context of the manufacturing sector in Malaysia. SMEs refer to small and medium-sized enterprises with an annual sales turnover of less than RM25 million with fulltime employees from 5 to 150 (SMIDEC, 2007). Ghani (2001) noted that SMEs are also regarded as businesses that generally serve local customers, have a limited share of the available market and are usually owned by one person or by a small group of people.

SMEs accounted for 96.6 percent or 37,866 enterprises of total establishments in the manufacturing sector. Approximately, 34.9 percent of the total output of this sector or RM 191.6 billion was contributed by the SMEs. These SMEs comprise various sub-sectors such as metal, plastic and electronic products as well as food and beverage manufacturing. The food and beverage manufacturing accounted for 15 percent or almost 5680 establishments, making it the third largest sub-sector after textiles and apparel (23.2 percent) and also metal and non-metallic products (16.9 percent) (Department of Statistics, 2006). It is also interesting to note that the food and beverages contribution in terms of output is the highest among all of the sub sectors, accounting for 44.1 percent or RM 84.4 billion. In addition, it is reported that the food and beverages sector was listed along with wood and furniture; metal and non-metallic mineral products; and rubber and plastic products as the major source of employment as it engaged more than half of the work force of SMEs.

Owing to their sheer numbers, size and nature of operations, the role of SMEs, particularly food manufacturing (food SMEs), in promoting endogenous sources of growth and strengthening the infrastructure for accelerated economic expansion and development in Malaysia, has been recognized (Ghani, 2001). Whatever the claims and statistics, Selamat et al., (2003) argued that this sector has another crucial role in protecting public health by producing the best and the safest food for the consumers. This is very true as Malaysian consumers spend almost 35 percent of their income on foods and most importantly 40 to 50 percent of their requirements for processed food are being obtained from the food SMEs' sector (Selamat et al., 2003). Ghani (2001) noted that the consumption of convenient food products such as 'easy-to-cook' and 'ready-to-eat' foods that are commonly produced by food SMEs is a growing trend among Malaysians. He added that these scenarios will further increase the food demand and the importance of food safety control within this sector. However, there is evidence that the product development has not been given appropriate attention by food SMEs, particularly in terms of the quality and the safety of their product.

Most of the foods SMEs in this country are still unable to fulfill the food safety requirements in producing safe food products. For instance, some of them

are still practising traditional ways of production rather than using advanced technologies, and these are inappropriate and substandard, producing poor quality and unacceptable products with a short shelf-life due to the lack of understanding of proper quality control and food safety among the operators and employees (Ghani, 2001). It is also reported that proper hygiene practices and procedures on the food production line are often being ignored by some of the food SMEs operators. Besides, the supply and the availability of raw materials are always inconsistent and consequently have caused outbreaks of food poisoning.

According to the Ministry of Health (MOH), there has been an increase in food poisoning cases from 1599 cases in 1993 to 2283 in 1994 (Razak, 1996). Meanwhile, in 1995, there were 28 reported food poisoning cases involving 907 victims with 2 deaths nationally. Of these, 681 were school children (Ahmad, 1996). Chua (2007) further revealed that the number of cases of food poisoning increased from 5957 in 2004 to 6157 cases in the year 2005. However, he added that the traceability of food poisoning cases and the food poisoning cases themselves are underreported in Malaysia and further suggested that the number of actual cases happened might be frightening.

Further to the above statement, cases of cholera, salmonella and typhoid were the most critical (Selamat et al., 2003) and they were closely related to food products, including those produced by the small and medium-sized food manufacturing enterprises. Subsequently, this has had a significant impact and caused severe brand damage for those companies involved (Ghani, 2001; Selamat et al., 2003; Chua, 2007).

From the aforementioned discussion, it may be understood that food SMEs throughout this country have an immense responsibility in protecting consumers' health, as Malaysian consumers' level of awareness of food safety and hygiene is still poor (Ghani, 2001). The foods SMEs have been producing inferior foods at low prices which could be dangerous for human consumption. The MOH, realizing the problems, along with other countries, introduced and promoted HACCP and it has been adopted by the food industry in Malaysia since 1995 as the most effective means for the identification, assessment and control of hazards in order to ensure that food is safe at the time of human consumption (Ministry of Health, 2002). Since HACCP was introduced, many large food companies have viewed it as a stepping stone to enhance the competitive edge of their food products in both the domestic and international market. As a result of HACCP implementation, the value of rejected local seafood exports declined by 64 percent or RM 31.6 million between 1997 and 2000. In general, the rejection rate of processed food for export was reduced by 50 percent (Selamat et al., 2003).

However, reports from MOH stated that the effectiveness of HACCP as a food safety control has not been given serious attention among the food SMEs compared to the large food manufacturing companies (Ghani, 2001; Selamat et al., 2003; Chua, 2007). This is probably because HACCP is not mandatory in

this country, therefore most of the food SMEs in particular are not taking serious measures to implement this system. This is also probably due to their lack of knowledge and resources. It is argued that the food SMEs are not keen to implement HACCP owing to the high cost of establishing it, as the HACCP certification fee itself costs food SMEs almost RM 4,000. At the same time, foods SMEs also have to finance the high costs of infrastructure, consultancy, training, auditing and process improvement necessary to meet HACCP requirements. Furthermore, as consumer awareness is still poor most of the food SMEs take the HACCP system for granted and perceive HACCP as another unnecessary burden for them (Ghani, 2001; Selamat et al., 2003).

However, despite the above concerns, some of the food SMEs in this country have implemented HACCP. In 2003 for instance, there were 101 food SMEs registered for HACCP implementation and presently, out of 5680 companies, about 254 small and medium food manufacturing enterprises have implemented HACCP in their organizations (SMIDEC, 2007). On a positive side, SMIDEC are expecting more food SMEs to implement HACCP from looking at the increment in the implementation rate from the previous years.

To date, most of the research undertaken focused on the barriers prior to HACCP implementation overseas (Taylor, 2001; Mortimore and Wallace, 2001; Yapp and Fairman, 2006; Khatri et al., 2007). Despite the proliferation of such studies, analysis on the factors influencing the implementation and the effectiveness of HACCP among food SMES is still limited, especially in Malaysia. In the other words, there must be an underlying motive for some of the food SMEs in Malaysia to still implement HACCP in their organizations despite the barriers identified.

METHODOLOGY

The qualitative study through the face-to-face interview approach was designed to explore the motives to implement the HACCP system among the food SMEs in Malaysia and the effectiveness of the system in terms of the managements' and employees' commitment and the productivity performance after the implementation of the system based on the representative managers' subjective perspectives and experiences. In validating the findings from the interviews, a quantitative research approach through survey questionnaires to the food SMEs' employees was also developed in assessing their levels of commitment and how they rate their management's commitment and production line productivity performances, as they are the actual people who run the company's operation.

Semi-structured interview questions were developed for the managers of the food SMEs. This semi-structured interview provides flexibility for the researcher to probe beyond the provided answers to solicit further detail (Berg, 1995 and Kumar, 1996). The structured questions developed relied on a series of open-ended questions, not only to provide in-depth and detailed information for the

research, but also to avoid any potentially biased responses during the interview, by ensuring that the responses were not led by the interviewer and the ideas were discovered rather than prescribed (Taylor, 2001).

For the quantitative approach, a self-completed questionnaire for the employees was designed and divided into three major sections. Each section contained the questions addressing the three different elements in assessing the effectiveness of the HACCP system from the employees' point of view, namely the employee's commitment (Section A), the management's commitment (Section B) and also the productivity performances (Section C). All of the items were based on the 5 point Likert scale (1= strongly disagree, 2= disagree, 3= neither agree nor disagree, 4= agree, 5= strongly agree).

There are about 254 food SMEs that have implemented HACCP in this country. Owing to the huge population and the geographical dispersion, it was therefore decided to undertake the study only in the Klang Valley in which 50 percent, or 125 food SMEs in Malaysia that have implemented HACCP, are located. From this number, only 10 small and medium-sized food manufacturing companies participated in this study. Nonetheless, according to McCracken (1988), for qualitative research of this nature, 8 respondents are adequate as the sample was intended to provide an opportunity to glimpse the complicated character, organization or logic of the culture. A representative manager from each company was interviewed regarding the HACCP implementation in their organization.

For the quantitative approach, the survey questionnaires were distributed among 20 current production line employees from each company with assistance from the representative managers. Only those who had been working for the company since before HACCP had been implemented in the organization were selected from each company as there were elements of comparison (before and after HACCP implementation) in most of the items included in the survey. A total of 200 responses from 10 companies were successfully obtained at the end of December 2007 and all of them were found usable. The response were then coded and keyed in for analysis using a Statistical Package of Social Science (SPSS) version 16.0. As for the qualitative information, the tape-recorded interviews were first transcribed for further content analysis.

ANALYSES AND RESULTS

Qualitative

Food SMEs' Profiles

All 10 companies represent a broad range of food manufacturing companies in Malaysia. They have penetrated the local market and also expanded their business into the international market, especially to the neighbouring countries, Middle Eastern countries, European countries and the US. All of the companies had implemented HACCP, but only 7 companies were certified. The remaining

three were still waiting for the certification. Based on the SMEs' definition drawn by SMIDEC (2007) 6 companies (Company A, E, F, H, I and J) fell under the medium-sized category, while the other 4 (Company B, C, D and G) were considered as small enterprises. Their profiles are simplified and presented in the following table:

Table 1: Food SMEs Profile

Company	Major Product	No. of Full-time Employees	Market Segment	HACCP status
A	Cooking oil, shortening, ghee	86	Local and Overseas	Certified
B	Sauces	50	Local and Overseas	Progress
C	Bakery, Cookies	30	Local and Overseas	Certified
D	Snack and Candies	47	Local and Overseas	Certified
E	Livestock	113	Local and Overseas	Certified
F	Seafood Processing	60	Local and Overseas	Progress
G	Sauces	46	Local and Overseas	Progress
H	Further Processed Chicken	91	Local and Overseas	Certified
I	Instant Noodles	67	Local and Overseas	Certified
J	Edible oil	77	Local and Overseas	Certified

HACCP Implementation: First Encounter, Initial Perception and Motives of Implementation

Results revealed that most of the managers came across HACCP from food exhibitions, seminars, magazines and newspapers as most of them were responsible for quality management in their organization. In other words, they always represented their companies at those food exhibitions. It was found that HACCP is a popular issue highlighted whenever food exhibitions are held in Malaysia. Here a few quotes from the respective managers:

"I always represent the company in attending the suppliers and customers appointments …the seminars and forums. I've met a lot of people in the industry and we always exchange ideas and share our experiences. I heard a lot about HACCP as well…"

"By the time I knew about it…hmm, I think around 2005, HACCP was really making headlines. It has been mentioned in magazines, exhibitions and even the newspapers…"

However, not all of them had a positive initial perception of HACCP as some of them doubted the necessity for HACCP and thought that their existing food safety control measure was adequately performed, and consequently they perceived HACCP as an extra burden for their companies. Some of them however realized the benefits from the implementation of the HACCP system, but their perceptions were overshadowed by their concerns about the cost and time to implement the system as illustrated in the comment below:

"… I was really concerned about the cost of the implementation. For large companies, it's not a problem. But for SMEs... it's hard…we care about it (money). The other thing was documentation… for me (that time), it's something that's hard to cope with. Probably, time consuming…"

From the interview analyses it was revealed that the main reason or motive of the food SMEs in this study for implementing HACCP was because of customer requirements locally and internationally. This is evident in that out of 10 companies participating in this study, 8 companies adopted HACCP because of customer requirements. This finding is supported by Nguyen, Wilcock and Aung (2004) in Canada and Khatri and Collins (2007) in Australia who found that this customer requirement is the 'true motivator' for food SMEs to implement HACCP, especially the companies that export their food products.

Some definite comments are shown below:

"It's just like a trend nowadays. You want to export; you have to comply with certain things. In most of our cases, the importers wanted to see our food quality and safety plan. And that's it… we must have HACCP at least. HACCP was acceptable for them. Furthermore, we don't want to harm anyone (consumer). Whoever our customer is, they deserve the safest food..."

"… Some overseas companies wanted HACCP assurance. It's our company's direction to expand its market. Without HACCP, we would lose potential customers."

Besides that, the other two reasons for adopting HACCP among participating companies were to improve operational efficiency and the company's perception of good practice. Nevertheless, these reasons are considerably minor compared to the above reason.

Managements' Commitment

The management strategies in disseminating HACCP theory and practical knowledge among the employees and their strategies to motivate and gain a full commitment from the employees towards and during HACCP implementation progress are very important. All of the 10 companies agreed that training is by far the most important element in implementing HACCP and should be conducted continually by either internal personnel or an external consultant. Both theory and the practical classes were provided for their employees and even for the managers and supervisory staff. Training programs did not only provide the knowledge and skills but were also crucial in motivating the employees. A response from one of the managers is as follows:

"HACCP training is a common activity among the employees. For staff, we have a theory classes for HACCP exposure. Then the on-job training (OJT) will be conducted. Here's the important part. It's like a moment of truth. The theory that they (employees) learned were put into real practice..."

It is also apparent that all companies used the build cards hanging on the walls to deliver HACCP knowledge and procedures in supporting their training programs.

"Oh, besides training, we have build cards in every production and filling line. We call it Work Instruction Procedures (WIP). We make them (build cards) quite big with large fonts, really visible for the staff. We want them to remember the procedures...to stick in their heads. Beside, they can get quick references if they forget something. It's also about efficiency. We want them to be able to work on their feet sometime."

Besides training, all companies preferred to use the psychological approaches to motivate and construct awareness about HACCP implementation among the employees. They further claimed that the management were concerned with the employees' comments or ideas and they reacted positively to them. Encouraging the employees through constructive comments and feedback were among the popular approaches given that the employees were actually handling a significant amount of change and extra tasks under the HACCP

implementation by the companies. All companies asserted that the tasks were fairly delegated to the staff considering the employees' capabilities. With regard to the employees' rewards, all companies did not simply reward their employees with cash or salary increment as they had invested a lot in HACCP implementation. However, there were companies which offered improved over-time rates for employees and even held parties to commemorate the employees' efforts.

Employees' Commitments

The employees' commitment to the implementation of the HACCP system in the participating companies was satisfactory. Most of the managers used the terms 'good', 'okay' and 'acceptable' to describe their overall satisfaction with the commitment among their employees. However, they did not deny that a few problems regarding the employees' commitment were encountered during the implementation progress and referred to the problems as the norm in any organization and business enterprise. The following quote might represent the whole scenario.

> *"I think I can see it from their work rates and their participation. Some of them were exceptionally outstanding…reliable and efficient. You could even see their commitment during the training…they asked a lot of questions. Performance-wise, everything was ok. I'm not saying all of them…but generally, I'm satisfied…honest. One or two comments or problems are normal. You can't totally escape from that."*

There were trifling issues on the different levels of commitment among the foreigners and the local employees, especially due to the language barriers, poor educational background and the poor perception of the system. Of 10 managers, 8 of them refused to directly point out the group of employees which were the most troublesome in the company and preferred to speak about these groups as a whole. However, from the remaining 2 managers, it was understood that the foreigners had a quite challenge understanding how the HACCP system worked in their organization and most probably had difficulties during the training due to language barriers and poor educational background. As for the local people especially the senior workers, they might have found it extremely hard to adapt and to cope with the HACCP system as they might look at the system cynically and perceive it as irrelevant. The numerous changes and hard work occurring within their usual and conventional environment probably affected their motivation and commitment and might have interrupted their other life interests.

It was also found that the tasks of inculcating motivation and commitment towards the HACCP cultural environment and changes among the employees in

a small and less structured organization were more straightforward compared to the medium-scale enterprises. Food SMEs with 50 to 150 employees (medium) with more formal management structures on the other hand, had slight difficulties in initiating and maintaining the employees' commitment towards the changes after HACCP implementation. This is evident as 4 companies which are considered 'small' enterprises based on the SMEs definition provided by SMIDEC mutually stated that their less formal structure in the organization had reduced the communication boundaries between the management and the employees hence, the strategies to gain employees' commitment were more effortless. The other 6 managers however, bemoaned the difficulties in handling the matters as their companies employed more than 50 employees in their organization which categorized them under 'medium' scale enterprises.

Productivity after HACCP Implementation

Interview analysis has illustrated the whole picture of all 10 managers' perceptions of the HACCP benefits on the companies' productivity, as all of them basically provided almost identical answers. All managers agreed that with HACCP implementation their sales had improved as they obtained more customers and markets either locally or internationally. The quote below translates the above notions:

"HACCP has worked magic…miracles for our company, combined with our marketing strategies. So far, our customer-base has been phenomenon..."

As the demand increased, they also claimed that the semi and fully automated machinery and equipment used in HACCP facilities' designs have aided them to increase the volume of production in their operation. The overall quality and safety of the products and even the processes have shown much improvement owing to the introduction of the personal protection equipment for the employees, the HACCP-based machinery and good supply management to minimize the risk of contamination and hazards during the manufacturing processes. One of the managers, for instance, stated that:

"The most obvious and usual problem before HACCP implementation was the physical contamination especially human hairs. Hairs were found in our products during the quality inspection (end-product testing). Now, with our personal protection equipment, we call it PPE, the problems have been solved"

Most managers also opined that HACCP implementation to some extent reduced the cost of food waste and recall, as HACCP focused on the prevention

of hazards rather than the end-product testing which could possibly damage the food product batches during   inspection.   HACCP also provided these companies with more real time control and the tight monitoring procedures during the production processes. The following response perhaps explains the situation:

"HACCP is a very cost-effective approach although the company spent a lot on the resources just for HACCP. It reduces raw products wastage. We fully use the raw material…standardized recipes and procedures. As a result the best foods are produced in terms of quality and quantity. At the end of the day we have more business."

Overall, food SMEs with HACCP recognition experienced an increase in sales and production volume, customers or markets, reduction in operating costs (less rejected/ recall products and a good supply of raw material), quality and safety improvements and in some cases the employees' food hygiene practices were improved.

Obstacles during HACCP Implementation

All companies did not totally escape obstacles or hassles during the HACCP implementation. Nine companies reported that they basically encountered resistance to change problems among the senior staff and even supervisors. This problem took place as the employees faced too many changes and became frustrated because they were not used to so many changes occurring at the same time. This in turn has probably made the dissemination of HACCP knowledge and training quite a challenge for these companies. The initial resistance to change and a negative paradigm among those employees also occurred because some of them did not have an adequate knowledge and understanding of HACCP in the early stage of the implementation. Below is one of the managers' responses on this matter:

"They said that HACCP procedures were 'too strict', 'banyak kerja' (too much work) and 'buang masa' (wasting time). We (management) got a bit of a headache from their attitude. Sometimes they're just ignoring the HACCP procedures but we've worked hard on that. Train and train again. It's not that bad now."

The other main obstacle was the extra paperwork and documentation required after the HACCP implementation. In this case, 4 company managers (Companies D, E, H and J) were not particularly pleased with the matter. Company E's QA manager for instance noted that:

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"Documentation is like an extra job. Everything must be on paper for reference…some kind of evidence. We should be ready to retrieve the document whenever a customer or audit asks for it. Every document must be thorough from every process we have…who handles the process, time, verifying that our HACCP was working properly. Not to mention the paperwork to be done in the early stage… HACCP manual, food safety policy and objective, operation, process control…"

Two managers (Company A and G) had slight concerns with the HACCP levels of strictness and also considered them as an obstacle during the HACCP implementation. Both of them complained about the wastage due to only slight damage to the personal protection equipment, wrapping (Company A) and boxes (Company G). The following quote illustrates the manager of Company G's frustration:

"… Our operation is operating smoothly with HACCP. All processes were all done with the best approach. But I'm a little bit uneasy about the fact that we have to replace the boxes which have slight damage with the new ones. Don't you think it is quite absurd?"

Quantitative

Based on the nature of the small and medium sized categories, it can be argued that the employees from medium-scale enterprises may have different perceptions of HACCP implementation from the small-scale enterprise employees. Small-scale enterprises have a relatively less formal or less structured organization as compared to the larger ones; which in the context of this study refers to the medium-scale enterprises. In determining whether the data obtained from employees of those different scale enterprises can be treated as a single population or separately, a homogeneity test using Independent T-Test analysis was initially undertaken to seek the existence of any differences among the employees participating in this study. There is only one statistically significant difference which appeared among thirty eight (38) items in the instrument. This difference does not have any significant impact on the overall findings obtained from all employees of the ten (10) companies. Therefore, the data were treated as one for analysis regardless of the size of the companies. Descriptive statistics by looking at the mean score were therefore applied. The discussion of the survey results among the production line employees is divided into three different parts based on the sections in the questionnaire, namely employees' commitment to HACCP, managements' commitment to HACCP and productivity after HACCP implementation.

Employees' Commitment to HACCP

The employees' attitudes and commitments to HACCP system implemented in their organization were analyzed and the mean scores reported by all employees who participated in the study are displayed in Table 2.

Table 2: Mean Score of Employees' Commitment to HACCP
Implemented

	Items	N	Mean (M)	S.D
1	With HACCP implementation, my job is harder than expected	200	2.33	1.089
2	My job becomes more interesting with HACCP implementation in my organization	200	3.54	.8079
3	I experienced pleasure in contributing to HACCP implementation in my organization	200	3.74	.682
4	I feel more committed to my job after HACCP was implemented in my organization	200	3.58	.725
5	I am willing to expend additional effort to make HACCP implementation successful	200	3.66	.761
6	Morale in work groups is higher after HACCP was implemented in my organization	200	3.69	.798
7	I am willing to accept any comment from my superior regarding HACCP	200	3.50	.730
8	I am willing to give any ideas to my superior to improve the effectiveness of the system	200	3.46	.715
9	I am more aware of the food safety issues after HACCP was implemented in my organization	200	3.70	.680
10	I feel more responsible for the quality and safety of the products that have been produced	200	3.63	.725
11	My commitment to food safety is greater with HACCP implementation in the organization	200	3.72	.746
12	I follow HACCP procedures thoroughly most of the time	200	3.84	.668
13	I am willing to learn everything about HACCP to improve my knowledge and understanding	200	3.54	.776

Most of the food SMEs' employees somewhat disagreed that HACCP has made their job harder (M= 2.33, item 1). Most of them claimed that their jobs became more exciting when the HACCP system took place in their organization (M= 3.54, item 2) and they were fairly well pleased with their involvement and contributions to the implementation of the system (M= 3.74, item 3). These reported sentiments have illustrated how the food SMEs' employees collectively accepted and welcomed HACCP system implementation in their working environments.

Most of them slightly felt that they were more committed to their job (M= 3.58, item 4) after HACCP had been implemented and had no hesitation in putting in extra efforts in ensuring the success of the system (M= 3.66, item 5). Therefore, there should be no argument with their level of agreement given to the item 'Morale in work groups is higher after HACCP was implemented in my organization' (M= 3.69, item 6). This is also proven by their willingness to accept any comments related to HACCP from their superior during their job (M= 3.50, item 7) but most of the employees reported that they were not sure whether they were ready to give any constructive ideas to their superior to improve the effectiveness of HACCP being implemented (M= 3.46, item 8). They might feel that they were not suitably qualified to do that as most of them do not really stand out in the academic area.

Besides that, most of the employees agreed that their awareness of food safety issues increased after HACCP had been implemented in their organization (M= 3.70, item 9) and consequently, they reported that they felt more responsible for the quality and the safety of their products that had been produced (M= 3.63, item 10). They also claimed that their commitment to food safety was greater with HACCP existing in their operation (M= 3.72, item 11). With their improved level of awareness of food safety and quality, it is not surprising that they followed the HACCP procedures meticulously all the time (M= 3.84, item 12). In addition, most of them somewhat agreed that they were eager to learn everything about HACCP to improve their knowledge and understanding of it (M= 3.54, item 13). Together these points, despite improving the employees' commitment towards their job, also prove that HACCP implementation had a positive impact on their commitment to food safety matters. It is believed that the good perceptions and opinions of HACCP among the food SMEs' employees would have brought about their acceptable level of commitment during the implementation.

Management Commitment towards HACCP

Thirteen (13) items were probed in this section to assess the employees' opinions on their managements' commitment towards the implementation of HACCP. The results are tabulated in Table 3.

Table 3: Mean Scores of Management Commitment to HACCP Implementation

	Items	N	Mean (M)	S.D
1	HACCP policies and goals were clearly explained by the management	200	3.67	.920
2	We received enough training and knowledge of HACCP from the management	200	3.92	.838
3	We were always kept informed on any HACCP matters or information by the management	200	3.79	.766
4	The amount of work after HACCP was implemented is not reasonable	200	3.34	1.054
5	The distribution of work after HACCP was implemented in our organization is fair	200	3.46	.844
6	We received enough instructions on HACCP procedures to perform our job well	200	3.85	.714
7	The manager always asks us to follow the procedures strictly	200	3.82	.737
8	The manager always monitors our performance after HACCP was implemented	200	3.75	.672
9	The manager always makes sure that HACCP works effectively	200	3.69	.692
10	We became closer to the management after HACCP was implemented	200	3.54	.955
11	The manager always encourages us to do our jobs well	200	3.49	.856
12	Management listens to and takes action on our comments on HACCP accordingly	200	3.33	.886
13	We were rewarded accordingly based on our performance along the HACCP implementation progress	200	2.67	1.029

Most employees somewhat agreed that their companies' management clearly clarified the policies and goals of HACCP implementation in their companies (M= 3.67, item 1). They further confirmed that the managements provided them with a quite sufficient HACCP training and knowledge to work in the HACCP implementation environment (M= 3.92, item 2). In addition, they claimed that they were always informed about any HACCP matters and

information by their managements (M= 3.79, item 3). Based on these results, it is understood that all companies informed the employees about HACCP and its purpose properly, and further provided adequate training and knowledge dissemination for them.

The following results might just further strengthen that justification. Employees did not quite concur with the item 'the amount of work after HACCP was implemented is not reasonable' (M= 2.34, item 4). However, they were not really sure whether the management distributed the work fairly after HACCP had been implemented (M= 3.46, item 5). It could be said that they were practically satisfied and pleased with the number of tasks that had been delegated among them but they could not really evaluate the job distribution by the management. This is probably due to the different tasks and processes within the company's production, as the employees participating in the survey came from various food processing lines. Thus, it might be argued that a single employee did not know exactly how the other employees from the other processing lines performed and probably were not aware of the differences in term of their amount of work. More interestingly, most of the employees claimed that they had enough instruction on HACCP procedures from the management to perform HACCP implementation (M= 3.85, item 6) and they were asked by the management to strictly follow the procedures (M= 3.82, item 7). In addition, the employees agreed that the management always monitored their performances after the HACCP system had been implemented (M= 3.75, item 8) and also believed that their management always made sure that HACCP was operating effectively (M= 3.69, item 9). These results indicate that most food SMEs' managements were always aware of the HACCP implementation progress and performance. It is pertinent to say that the companies had spent a lot of money and time on HACCP and unquestionably, they wanted their investment to pay off.

Besides that, majority of the employees admitted that they became closer to the management after the implementation of HACCP (M= 3.54, item 10). This result probably makes sense as the implementation of HACCP, particularly in the HACCP plan development required an organizational commitment which translated into the dynamic involvement from every level of the organization (Wallace, 2001; Taylor, 2001). In other words, the rapid communication among the management and lower level employees during HACCP implementation might have reduced the gap between them. Nevertheless, the results showed that employees were not really sure whether they always received encouragement from the managers to perform well (M= 3.49, item 11) and whether the management listened and took actions from their comments accordingly (M= 3.33, item 12). In the interviews, most managers stated that they always encouraged the employees, listened and responded to employees' comments which they referred to as some kind of 'psychological approach'. These quantitative results however did not particularly portray those interviews' findings even though the employees did not fully reject the statements. What can be assumed here is that, as the

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companies have many employees, there might be possibilities that the managers' psychological approaches were uneven among individual employees and affected the employees' responses to those related items.

From the interviews, most managers claimed that the psychological approaches were the most common strategies to motivate their employees and gain their commitment. It was also obvious that salary increment was not on the list, although some companies offered an improved over-time rate to the employees. Therefore, it is not surprising that they positioned themselves as 'unsure' on the item 'We were rewarded accordingly based on our performance along the HACCP implementation progress' (M= 2.67, item 13). However, as discussed earlier, most of the employees were quite pleased with the HACCP implementation in their organization. It could be said that 'money' or 'tangible rewards' did not directly affect the employees' happiness and commitment in their HACCP environments if it was made clear about HACCP matters and they were provided with enough training, knowledge and motivation.

Productivity Performances after HACCP Implementation

12 items developed to measure the subjective productivity based on quality, quantity, schedule, cost, timeliness and task efficiency suggested by Ramirez and Nembhard (2004) were used in this section. Slight adjustments however have been made to the items to suit the purpose and the nature of the study. The results are shown in Table 4.

Table 4: Mean Score of Productivity Performances after
HACCP Implementation

Item no.	Items	N	Mean (M)	S.D
1	Our products' quality is better with HACCP	200	3.93	.720
2	Products are safer with HACCP	200	3.93	.846
3	There are fewer rejected products after HACCP has been implemented	200	3.78	.736
4	There are fewer complaints from the management level on the output after HACCP has been implemented	200	3.71	.912
5	All inputs were fully utilized in our production line with HACCP	200	3.56	.912
6	Every task was accomplished on time as scheduled with HACCP	200	3.69	.835

7	We sometimes work overtime to meet HACCP requirements and procedures	200	3.79	.747
8	We have wasted a lot of time in following HACCP procedures	200	2.88	.970
9	Excessive HACCP documentation reduces our productivity and performances	200	2.38	1.064
10	Our productivity has increased after HACCP has been implemented	200	3.92	.878
11	The production line works effectively when HACCP is in place	200	3.83	.815
12	HACCP has made our job easier	200	2.98	.913

Most of the employees agreed that the quality of the products were better after HACCP had been implemented in their organization (M= 3.93, item 1) and further admitted that their products were safer than before (M= 3.93, item 2). With those perceptions, the employees also reported that there were fewer rejected products (M= 3.78, item 3) and the managements' complaints on the final products have been reduced (M=3.71, item 4). More interestingly, all inputs or raw materials were fully utilized with the implementation of HACCP in their companies (M= 3.56, item 5). All of these employees' perceptions in fact, reflected what has been found from the managers' interviews analysis thus, it could be said that HACCP implementation is meaningfully worthy in improving the cost control and food products' quality.

With regard to the schedule and timeliness, most employees somewhat agreed that every job that had been delegated was accomplished as scheduled after HACCP implementation (M= 3.69, item 6) even though sometimes they were required to work overtime to meet the HACCP requirements and procedures (M= 3.79, item 7). Nevertheless, they were not sure whether they had wasted a lot of time in following those HACCP procedures (M= 2.88, item 8). It is understood that the amount of work after the implementation of HACCP is relatively high (Taylor, 2001) but the employees have probably managed to follow the production schedule by extending their actual working hours to meet the demand. That might provide the answer to their level of uncertainty whether HACCP wasted their time, as apparently they got paid for their overtime.

Besides that, most employees did not agree that HACCP documentation reduced the operations' productivity performances (M= 2.38, item 9). In fact, they believed that the company's productivity improved as a result of implementing HACCP (M= 3.92, item 10). Furthermore, they claimed that the production lines worked more effectively when HACCP took place in their organizations (M= 3.83, item 11). In responding to the last item 'HACCP has made our job easier', most food SMEs' employees chose to place themselves under the 'uncertain' conditions

(M= 2.98, item 12). Again, the employees' perception supported the findings from the interviews with their managers. As the demand increased, semi and fully automated machinery and equipment used in HACCP facilities, combined with the HACCP well-organized procedures have undeniably improved the food SMEs' productivity performances. However, despite their convincing views on the overall productivity, most employees were comfortable to remain 'undecided' whether HACCP has made their job easier, probably due to some extra work and additional strictness emerging as HACCP took place in their organization.

In sum, the findings from the employees basically validate the managers' views on the company's productivity after HACCP implementation. HACCP implementation has positively affected the food SMEs' productivity in terms of quality, quantity, schedule, cost, timeliness and task efficiency. Therefore, it is remarkable to declare that HACCP implementation in the food SMEs sector is really worth the effort.

DISCUSSION AND IMPLICATIONS

To this end, it is proven in this study that HACCP is a very good food safety system in controlling the risk of food hazards in the food SMEs, even though at the initial stage after its introduction, only the large food manufacturing companies dared to invest in that system. In fact, most of the results from the survey have validated the findings from the interviews with the food SMEs managers. This study has clearly demonstrated that the main motive of food SMEs in implementing HACCP was customer requirements from either local or international markets. Food SME customers were not only the end user or the consumer, but also the larger companies and even the large retailers who subsequently distribute their products. But at the end, the supply chain would certainly stop at the end user as well, thus food SMEs have a huge responsibility in protecting public health, especially in combating the escalation of food borne diseases in Malaysia. Interestingly, findings also showed that the majority of food SMEs in Klang Valley that implemented HACCP experienced many benefits and improvements in terms of their sales, food quality and safety as well as productivity performances, although there were a few obstacles during the implementation processes. However, when they noticed the improvements, most of them were really pleased and claimed that HACCP was really worth the hassle.

These findings have created a fine path for the food SMEs to take a full stride towards the implementation of HACCP. Food SMEs that have not yet implemented the HACCP system therefore should view it as the most reliable measure in producing the safest food products for their consumers. It could be meaningful for these food SMEs to implement HACCP as food safety issues have become so popular and more countries are going to make HACCP a mandatory uptake in any food business. The implementation of HACCP would definitely improve the product quality and safety, and without a doubt it would create

more 'money-spinning' opportunities for food SMEs to penetrate the local and international markets. Most importantly, they should consider adopting the system as the substandard quality and safety of products are not going to sustain their brand image in the market.

The number of food SMEs that implement HACCP is continually increasing and this positive development might be contributed to from the HACCP exposure in the food exhibitions and food seminars as identified in this study (SMIDEC, 2007). However, it should be remembered that approximately only 250 food SMEs have implemented HACCP out of almost 6000 food SMEs throughout Malaysia and the figure could be massively increased in the upcoming years. Looking at the figure, one can see that the task of promoting HACCP among the food SMEs is far from straightforward, thus signalling the need for government or related authorities' intervention and assistance in improving the current situation. The Ministry of Health (MOH) in close collaboration with other relevant agencies, namely the Department of Veterinary Services, Department of Fisheries, Department of Agriculture, SIRIM QAS, MARDI and academia should therefore work together in improving the current HACCP implementation promotion by aggressively disseminating HACCP information and benefits to the food SMEs nationwide, especially those companies without the HACCP system in place. There might be the possibility that some of them have not even received the information before.

It is also understood that the MOH has set a target to impose HACCP certification on all food products including the SMEs within the next ten years (New Straits Times, 2001). MOH and the associated agencies could enthusiastically and actively organize more seminars and promotional activities to cultivate or initiate food safety and quality awareness culture among all food SMEs in Malaysia. It is believed that in the long-term, these kinds of promotions could also help the food SMEs to be more competitive in the local and international markets and automatically boost the Malaysian economy.

The above suggestions might sound uncomplicated, but the actual enforcement could be very challenging as food SMEs, especially the small scale companies are mostly lacking in technical and financial resources. In fact, these resources are the most common barriers or impediments in implementing HACCP that have been quoted and documented in many studies worldwide. It is worth mentioning here that all food SMEs which participated in this study actually received the 'quality improvement grant' from the government through Small and Medium Industry Development Corporation (SMIDEC). The grant provided only covered around 50 percent of the HACCP implementation's total cost, but it was really meaningful for those food SMEs in slightly reducing their load.

From the success of those food SMEs with that endowment, it therefore would be inspiring if the government could offer more grants, subsidies or loans for the food SMEs in relieving their financial burden and improving the facilities and infrastructures. SMIDEC and related agencies should make sure that the information about the grant reaches every food SME in this country, as some of them might not be aware of the matter. Besides that, as an alternative, the small-

scale food manufacturers could also merge to create a big company through the cooperation concept, and consequently the company can invest in HACCP and better physical structures (Zakariah, 2005).

As a conclusion, it is hoped that the recommendations and information obtained from this study will assist the food SMEs in particular to implement the HACCP system in their organization, in order to improve the implementation rate among them. The implementation of the system might be too costly for food SMEs, but the proven long-term benefits enable them to compete and establish their name in an intense local and international market, as well as making the most of it to create huge sources of profits. The government related authorities in addition should take proactive solutions to help this sector, as both parties will be able to enjoy the economic benefits. On the other hand, consumers must be really sensitive to the food safety issues in preventing substandard products from entering the market, thus forcing the SMEs to implement HACCP. Finally, quality and safety management is gradually becoming the core of any food business, thus the food SMEs should follow the same pace and implement HACCP as a precautionary step for unexpected future requirements in order to survive in the business. As a result, the Malaysian food SMEs products will not only be accepted in the local market, but will also be recognized internationally.

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