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## Cook-chilled Food in Malaysia Primary Schools: What the School Headmasters Think?

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### Abstract

The implementation of a cook-chilled food production system has been considered as an effective and viable means for school foodservice operations in decreasing the costs and increasing the productivity. This is obviously occurred in many developed countries. However, to date there is still lack of study specifically looking at the knowledge, awareness, level of acceptance and factors that inhibit the implementation of the cook-chilled food production in Malaysian Primary school meal system. Through interview sessions with the primary school headmasters in Petaling District, Selangor, Malaysia, some useful insights on issues investigated were revealed. Although still not comprehensive, the understanding, acceptance and goodness on the implementation of cook-chilled food in the primary school are gradually appeared among the school headmasters. However, less capital investment among the canteen operators and lack of knowledge in the food safety among its personnel still stalled the process. These indicators have undoubtedly drawn several practical implications not only for the canteen operators, headmasters but also the responsible authority.

**Keywords:** Cook-chilled, Food, Primary School, Headmasters And Canteen Operators

### Introduction

There is no doubt that, besides home, children are spending a portion of their day in school. In line with this notion, school not only acts as a transmitter of knowledge and academic skills to the children, but it is also an important place in instilling food nutritional values through healthier food choices (Best et al., 2010). Experts agreed that schools in addition to its main functions have a crucial role in preventing children obesity by creating comprehensive nutrition services and incorporating nutrition education and promote the healthy eating (Moy, et al, 2006). Despite this, school children particularly in the third world and even in the well developed countries have long been faced with the food nutritional issues. This is evident when many cases dealing with obesity, type 2 diabetes

mellitus (T2DM), food poisoning and many others are reported which caused by the foods consumed at the school canteen despite the efforts and regulations (Janssen et.al, 2005). It had been scrutinized that the nutritional value of the food items being served at the school is not the only reason, but lack of healthy options that governs the whole system of the school canteen operation also cause the causation (Florentino et al., 2002).

Similar situation happens in Malaysia where food safety is recognized as the biggest problem among school canteens in this country (Rosmawati, et al, 2017). This food safety mainly involved the overall school canteen operation not only relate to the awareness of the appointed canteen operators, it's employees and most importantly, it deals with the quality of the food ranging from the ingredients or raw materials used, methods of preparation, storing processes and mode of serving the food (Lee and Manan, 2014). In this context, although some school canteen operators undertake scratch cooking process or preparation in the premise, however with the intention of reducing the cost and lack of proper standard kitchen operation relating to facilities, the food safety standpoint in term of quality food was not utmost preserved. In line with this notion, as food has become part of an integrated delivery system in many institutions like hospital and school, the available alternatives are becoming important and must be explored.

In addition to the conventional technique, the implementation of a cook-chilled food production system is claimed to be one of the most effective and viable means for foodservice operations (Nettless, et al, 1997). A cook-chilled system is a food preservation technology in which foods are fully cooked, rapidly chilled, refrigerated for storage, and reheated before serving or a catering process whereby meals or meal components are fully cooked, then cooled by controlled chilling (blast chilling) and subsequently stored at a temperature above freezing point (i.e.  $\leq 3^{\circ}\text{C}$ ) prior to regeneration and/or service (Greathouse,1989). The operating temperatures and cooling rates in this technique must be low to inhibit the growth of the relevant microorganisms. According to Nettles et al (1997) cook-chilled is a new of thinking of the production process that meals are now cooked to the inventory rather than to meet meal time deadlines.

Some argued that this food service system has been developed in response to the increasing of labor costs, shortages of skilled labor, low productivity and ineffective delivery that permitted losses in temperature and quality of food between preparation and services (Karolyn, 1993). Although not a cost effective in the premises with less than 300 peoples, it evidently decreases costs and increase productivity in the large establishments like factories, hospital and even school. In the developed countries, like the United States, the United Kingdom, France and Japan, cook-chilled system has been widely applied in the hospital and nursing home foodservice, country foodservice, industrial foodservice, commercial feeding, food processors, inflight kitchen and even the school meal production (Nancy, 1995). It has been demonstrated that the application of this system can provide convenience and safety with the retention of nutritional content (Mirian, 1994). In this sense, despite being internationally recognized, there is still a lack of consensus among the country's education authorities and school headmasters with regard to the ability and the acceptance of the cook-chilled system in school meal production. In fact, there are no studies looking at the highlighted

issue in the Malaysian school meal system. For the benefits of the nation, particularly the school meal system and children, this issue needs to be investigated. With that, this study investigates the school headmasters' knowledge, awareness, level of its acceptance and factors that inhibit the implementation of cook-chilled in the Malaysia primary school meal system by the canteen operators.

## **Literature Review**

### ***School Children and Food***

It is well-known that the school function is extended rather than being the teaching center. It is also a place where children and their family come in contact with the society (Briefel et al., 2009). According to Ogden et al., (2008), school is an important setting for the development of children dietary practices as they spent almost three quarters of the day in that premise. In fact, as school environment has been recognized in educating and modeling children eating behavior, school should provide and serve nutritious food to the children. Failure in maintaining and serving a healthy diet may result in unhealthy growth and development of the children and consequently affect their learning processes (Best et al., 2010; Khor et al., 2011). Neumark, Sztainer et al., (2005); O'toole et al. (2007) and Jaime & Lock, (2009) found that there is a strong association between school food environment and children eating behavior. Easy accessibility of low nutrient, high fat and sugar foods in school canteens has marked influence on school children choice of food (French et al., 2003; Neumark-Sztainer et al., 2005; O'toole et al., 2007). Bell and Swinburn (2004) and Bevans et al. (2011) accentuated that high fat, high calorie and low nutrient foods remain abundantly available in many schools' canteens like energy-dense foods and beverages such as fat spreads, packaged snacks, biscuits and fruit/cordial drinks.

Many initiatives have been taken throughout the world to ensure food served in school canteens comply with nutrition standards such as the Dietary Guidelines (McGuire, 2011), healthy canteen strategy (Yoong et al., 2015) and school nutrition policies (Dubuisson et al., 2015). In Malaysia, there are a number of strategies introduced by Ministry of Education (MOE) especially the School Health Programme (Khor, 2005) and Management Guide for Healthy School Canteen (MOE, 2011). Despite some small noticeable improvement, it still did not meet the target in terms of nutritional status of the school children, improving knowledge and skills of the food handlers or school canteen operators and effective follow-up, monitoring and mentoring (Soon et al, 2011).

### ***Cook-chilled System and Its Implementation***

Based on the literatures, many available studies on cook-chilled were done from the operational and the scientific perspective. Decision making is one of the areas that received significant attention among the academic scholars. As early as 1977, scholars argued that the process of deciding which foodservice system to implement should be a systematic business decision (Koogler and Nicholanco, 1997). Greathouse & Gregoire (1988) and Nettles et al (1993) investigated variables related to the selection of conventional, cook-chilled and cook freeze system while others comparing the system with various systems based on the operational elements (Green, 1992) and financial data (Greenhouse et al, 1989). Nettles et al (1997) found that the decision process used by the

foodservice directors who selected a conventional system appears to differ significantly from the process used by directors who selected cook-chilled system as it deals with return of investment, projected costs and calculate more values. Kim et al (2006) revealed that the inconsistency in food quality associated with time and temperature were observed more frequently in the cook-chilled system than the conventional system. However, the different is due to the lack of knowledge among the school foodservice personnel in maintaining the quality and safety of the products. Nevertheless, there is no agreement as to which system provides the best food quality as in most cases, the effect is product specific (Rogers, 2005). It is suggested that chilling is less damaging to texture and juiciness than freezing (Tansey et al, 2003) while cook-chilled is superior in terms of vitamin retention but detrimental to sensory quality (Church and Parsons, 2000). It has also been suggested that menus from hospitals using cook-chill systems provide greater choice of hot menu items (Williams, 2002) although, do not necessarily support and improved dietary intake by patients (McClelland and Williams, 2003).

## **Methodology**

### ***Sampling and Population***

As this study aims to understand, recognizing and unveil matters relating to human behavior rather than describing their behavior through arithmetic or statistical analysis, a qualitative approach through interview was applied for information gathering. The population and the unit of analysis were among the primary school headmasters who are responsible for deciding school children's meal or selecting the school canteen operator. The result of this study will create a fundamental basis for future studies thus using one contextual location for data collection would be sufficient. With that, the contextual study setting is Petaling District in the state of Selangor, Malaysia which comprises of Shah Alam, Petaling Jaya and Subang Jaya area.

With the regard to sample size, Merriam (2009) stated that there is an ambiguity in determining the sample size for a qualitative approach as it depends on a list of questions, the type of data gathering, analysis and the resources that researchers have to support the study. Patton (2002) initially explained that qualitative researchers are not bound by any specific rules in determining the sample size for the study. The sample size is dependent on what the researcher wishes to know; the purpose of the inquiry; the usefulness of the information; the credibility of the information; and what is possible with the available time and resources. Based on this argument and some other constraints, 40 school headmasters in the Petaling District were chosen as a sample.

### ***Research Instrument***

A series of semi-structured interview questions or open ended questions was developed to obtain an in-depth and detailed information on the investigated matters. These open-ended questions were used to avoid any potentially biased responses and with the idea to discover rather than prescribe. The questions were designed in an interactive way to clearly elicit and develop a relaxing and friendly atmosphere during the interview. All questions were created by the researchers in addressing the objectives of the study.



### ***Data Collection***

Before the interview process, all identified primary school headmasters were contacted via telephone; seeking permission to be interviewed. At the same time the introduction and the consent letter along with the cover letter was mailed to notify them about the aim of the study as well as assuring them about the confidentiality of the information from the interview. Only twenty-one (21) school headmasters were willing to be interviewed after a few confirmation. The dates and times for the interview session were then prearranged based on the convenience and wishes of the school headmasters which required unlimited flexibility on the part of the researchers. Before the interview session, each school headmaster was given a little explanation about the cook-chilled system so that they have the pre-determined ideas about the interview. All interviews session lasted between thirty minutes and one hour on average. Overall, the researcher was fully satisfied with the answers provided and grateful with the commitment and the cooperation given by all of them towards the interviews.

### **Results**

It is important to note that the name of the school headmasters and location of the interview are not disclosed in this paper to preserve confidentiality and anonymity, thus throughout the analysis they are addressed as “HEADMASTERS”. It is also worth mentioning that a narrative analysis is used in the interpretation of the information gathered. This analysis captures something important about the data in relation to the research issue and represents some level of patterned response or meaning within information collected or creating an aggregate of a group of approaches.

### ***Informants Profile***

All 21 school headmasters participated in this study were senior teachers whereby all of them have been in the education line for more than 20 years with the age range between 50 to 56 years old. Before holding the school headmaster position, they have been teaching or working in various schools in Selangor and other states in Malaysia. All of them have received a recognition from state department of education for their achievement thus being appointed as a school headmaster.

### ***Knowledge and Awareness on Cook-chilled Food System***

The first question asked about the knowledge and awareness on the cook-chilled system. Seven school headmasters admitted that they do not have any knowledge about the cook-chilled system prior to the interview as they have never been exposed to the topic. On the other hand, some claimed to have information and understanding about cook-chilled and realized its application in large-scale food factories, catering operation, hospitals and even schools particularly in the western countries. However, most them think that the system is very expensive and sophisticated and further admitted that the cook-chilled foods are not available in their school canteen.

### ***Level of acceptance of the cook-chilled food to be implemented in the Primary school meal system***

With regard to the second question, only answered given by those who understand the cook-chilled system is highlighted. In responding to the question, few headmasters noted that each school is bounded by the School Health Service Guideline set by the Ministry of Education in collaboration

with the Ministry of Health (MOH). However, the school is authorized to choose a qualified caterer or operator to run operations at the school canteen with stipulated guidelines and the approved menu. With that rule, the appointed school canteen operator may provide cook-chilled food in the school canteen as long as it complies with the safety standards and obtains permission from the school authority. In addition, the school authority is also responsible in ensuring the license, surrounding or healthy of the school canteen, the facilities and the food handlers is certified by the Department of Health. A teacher is normally assigned to observe the school canteen operation with a weekly report required. Thus, as cook-chilled is dealing with the processes of fully cooked food, chilled or refrigerated and reheated before serving with quality of food is utmost preserved, it is therefore acceptable and could to be implemented in the primary school meal system as long as the appointed operator is able to control it safety and nutritional values. Nevertheless, few headmasters posited that not all Malaysian food, for example, fried noodle and fried rice are suitable to be cook-chilled and this system would only be suitable in the urban area with higher student population compared to schools in rural areas.

### ***The underlying factors that inhibit the implementation of cook-chilled in the school meal system***

The third question probed was intended to reveal the underlying factors that inhibit or restrict the implementation of cook-chilled in the primary school meal system by the canteen operators. From the interview, the school headmasters who understand the cook-chilled system felt that a few factors are restricting the use of it among the canteen operators'. According to some headmasters, primary school canteen is normally run by the individual or small enterprises. These small enterprises are usually having less capital investment or just enough to run the operation. Small investment capital and small profits margin earn make it difficult for them to use the sophisticated equipment in their operations. In addition, the school headmasters also asserted that the school canteen personnel usually have a limited knowledge about food safety and food operations due to their poor educational background.

### **Discussion and Conclusion**

The implications drawn from this study can be looked from two perspectives. On the academic side, the insights obtained directly expanding and strengthening the existing literature particularly customer's behavioral studies. As previously mentioned, due lack of the available studies on the cook-chilled study in Malaysia the result will create a fundamental basis or creating a path and platform for other researchers to look and expand much broader scope in the future. In other word, this study finding definitely added or probably create new documentation and information on the cook-chilled system that is valuable particularly for those involved in the catering including the school canteen operations.

From the practical perspective, the information and the important lesson learned from this study is that school besides a place of nurturing children knowledge and academic skills, it plays an important role in providing and serving healthy competitive food choices. As Malaysia is heading toward developing country status, besides others, inculcating a healthier culture in children in and outside school it utmost important. Thus, implementing the cook-chilled system in addition to conventional

one would be able to provide a proper combination of energy, fiber and nutrients to help the growth and maintain children's health and combatting the obesity. This is in line with purview of the National Plan of Action for Nutrition Malaysia (NPANM) 2016-2025 and policy options to combat obesity in Malaysia and the Management of Healthy School Canteens guidelines which to continually improve school children nutritional status.

Many primary school headmasters understand the cook-chilled system and its benefits. Some in fact realize that cook-chilled can reduce the labor costs, shortage of skilled labor, increase productivity and bringing more effective delivery system of food thus ready to be implemented in the school canteen by the operators. Nevertheless, question arises whether the canteen operators is ready to inject some investment toward those systems. This scenario really given significant impact only to the headmasters, canteen operators and the responsible or relevant authority.

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