

## **Evaluating the Food Safety Knowledge, Attitudes and Practices (KAP) of Kitchen Staff in Economy Hotels in Cairo and Giza**

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### **Abstract**

The research aims at evaluating the food safety knowledge, attitudes and practices (KAP) of kitchen staff in economy hotels in Cairo and Giza governorates. This is to identify the weak points in food safety KAP of kitchen staff and propose the development plan. Food safety evaluation is applied in 12 economy hotels as a field survey sample representing 20% of total economy hotels in Cairo and Giza. The research utilizes three analytical tools: interview with the executive chef of each hotel, food safety checklist in kitchen area and food safety test to 3 chefs per each hotel. Sample selection considers variation in geographical distribution and hotel classification. Findings clarify that the overall evaluation of food safety KAP of kitchen staff is poor. The weaknesses are focused on incorrect food storage, improper thawing processes, mishandling of uncooked food and inappropriate preservation of hot and cold food temperature. The research recommends the development of food safety academic curricula with additional practical test. It also proposes the arrangement of food safety seminars by concerned ministries. Finally, it suggests the necessity of creating a food safety operational standards and instruction guide in economy hotels.

**Keywords:** Evaluation, Food Safety, Kitchen Staff, Economy Hotels, Cairo, Giza

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### **Introduction**

The activities of food handling and the quality of services are directly related to employees and owners of food and beverage service establishments. This is due to the fact that they are responsible for managing hygienic-sanitary quality and providing safe food to clients.<sup>1-2</sup> The increasing incidence of foodborne diseases has been assigned to many different factors, including population growth, changes in food preparation habits, a rise in the number of food-service establishments, increased consumption of food outside the home and a lack of food safety training and education among consumers and food handlers.<sup>3</sup> Worker mishandling of food is one of the major causes of food borne disease outbreaks.<sup>4</sup> Since outbreaks often lead to severe economic losses, food handler education and training is an important business strategy for managing food safety risks. Moreover, food handler education and training is seen as one strategy by which food safety can be increased, offering long-term benefits for the food service industry.<sup>5-6</sup> Education and training activities closely associated with work environment would be more appropriate than food hygiene courses that are divorced from the workplace.<sup>7</sup> The education and training of kitchen staff is a necessary precursor to the implementation of realistic food safety practices within the workplace. The effectiveness of education and training is very dependent on both management attitude and their willingness to provide the resources and systems for food handlers to implement good practices. There is a need to develop education and training methods that proved to change behavior, attitude, practice as well as imparting knowledge.<sup>8-9</sup>

### **Review of Literature**

#### **Knowledge, Attitudes and Practices (KAP) Model**

People are the principle sources of food contamination. Various studies demonstrate the contamination of food by employees in commercial establishments, with the leading causes being poor personal hygiene of employees, handlers contaminated by intestinal parasites, improper food preparation practices, preparation of food too long before consumption or insufficient cooking or reheating of food and cross contamination.<sup>10</sup> Thus, proper practices, attitudes and behaviors by food handlers in restaurants and kitchens are essential to providing safe food.<sup>11</sup> The relationship between knowledge, attitudes and practices is often explained through the KAP model.<sup>12</sup> The KAP model assumes that an individual's behavior or practice (P) is dependent on their knowledge (K) and suggested that the mere provision of information will lead directly to a change in attitude (A) and consequently a change in behavior. It has been suggested that this model is flawed in its assumption that knowledge is the main precursor to behavioral change.<sup>13-14</sup> Knowledge accumulates through learning processes and these may be formal or informal instruction, personal experience and experiential sharing.<sup>15</sup> Knowledge however is not insignificant and it is found to be vital in the cognitive processing of information in the attitude-behavior relationship.<sup>16</sup> Attitude involves evaluative concepts associated with the way people think, feel and behave.<sup>17</sup> It comprises a

cognitive, emotional and a behavioral component implying what you know, how you feel and what you do.<sup>18</sup> It has also been postulated that attitudes may influence one's intention to perform a given behavior or practice. They are thus correlated with behavior, for instance if a person has a positive attitude towards appropriate hand washing, they are more likely to wash their hands.<sup>19</sup> Behaviorists further add that a number of factors can influence one or more of the KAP variables such as self-esteem, self-efficacy and misconception.<sup>20</sup>

### **Food Safety Knowledge, Attitudes and Practices**

It is important to have an understanding of the interaction on prevailing food safety beliefs, knowledge and practices of food handlers in order to minimize and prevent foodborne outbreaks and illnesses.<sup>21-22</sup> Food safety knowledge means that food handlers and their supervisors know what must be done to keep food safe. Attitudes are positive or negative evaluation of people and activities in food safety and sanitation environment. Practices or behaviors are the observable actions of an individual in response to a food safety system.<sup>23-24</sup> There are four types of relationships between knowledge, attitude, and behavior. The first type of relationship exists where knowledge can directly influence attitude but not directly influence behavior. The second type of relationship exists where knowledge and attitude influence each other at the same time. The third type of relationship exists where knowledge and attitude independently influence behavior. The fourth type of relationship exists where knowledge shared direct and indirect influences on behavior. Attitude was the mediating variable between knowledge and behavior.<sup>25</sup> Most studies in food safety have shown mixed results when examining whether increased knowledge leads to better food safety attitudes, practices, and behaviors. Some authors found that enhancing knowledge can change behaviors, attitudes and practices.<sup>26-27</sup> Improving knowledge through training alone may not result in behavioral changes.<sup>28</sup> There are significant discrepancies between reported food safety knowledge and food safety practices.<sup>29-30</sup> The main factors which affected employees' food safety behavior include time pressure, equipment and resource availability, management and co-workers' attitude to food safety, and food safety education and training.<sup>31</sup> Food safety improvement requires more than food safety training and that training should be multidimensional.<sup>32</sup> Furthermore, some studies have reported that although training may bring about an increased knowledge of food safety, this does not always result in a positive change in food handling behavior. It has been suggested that this disparity between knowledge and practice occurs because of much of the existing training.<sup>33-34</sup> Knowledge, attitude is also an important factor that ensures a reduction trend of foodborne diseases.<sup>35</sup> The responsibility of having positive attitude towards food safety does not only lie on the shoulder of the management team. Employees, students and even any food handlers should take their own initiatives to enhance their knowledge in the matter and profiling themselves to be more positive.<sup>36</sup>

### **The Impact of Education and Training in Food Safety**

Food safety beliefs, attitudes, knowledge, and practices can be changed through educational intervention and effective training.<sup>37</sup> Education and training of food industry personnel in hygiene and food safety matters has been recommended as a means of improving food handling practices, and thus, the safety of food.<sup>38-39</sup> This is attributed to the fact that human handling errors have been responsible for most outbreaks of food poisoning in developing and developed countries. For example, the hepatitis A virus can be introduced by unwashed hands of food handlers who are themselves infected. Therefore, good personal hygiene as well as sanitary handling practices in the food processing area are essential components of any prevention programs for food safety.<sup>40-41</sup>

The Centers for Disease Control (CDC) has identified five risk factors related to the human factor and preparation methods that contribute to the high prevalence of foodborne illness. These are improper holding temperatures, inadequate cooking, contaminated equipment, food from an unsafe source and poor personal hygiene.<sup>42</sup> The WHO has developed the five keys to safer foods, a tool to enhance food safety behaviors that if followed, or adopted, can reduce foodborne illness occurrence. The five keys are specific behaviors each linked to these five risk factors that will likely reduce foodborne illness. The five Keys to safer foods are: keep clean, separate raw and cooked, cook thoroughly, and keep food at safe temperature, use safe water and raw materials.<sup>43</sup> There is, however, lack of documented evidence of improvements in food hygiene standards which can be directly related to education or training of staff.<sup>44</sup> Training is the single most important element when setting up a food safety system which provides not only the technical skills required to implement food safety, but also helps to change the attitudes of people.<sup>45</sup> However, in several food companies which had a food safety system in place, the key informants had obtained low knowledge scores and there are several reasons have been put forward for a training being less effective than initially planned; resistance to training among trainees, failure to appreciate the kind of training required, training the wrong people, lack of follow-up from training, inconsistent and poor quality training programs and lack of resources.<sup>46</sup> Education and training on food safety should be given to all staff in food processing businesses so as to bring behavioral changes besides adoption of positive attitudes.<sup>47-48</sup> Food handler training can improve the knowledge and practices of food handlers, particularly if combined with certification; and selected community based education programs can increase public knowledge of food safety for all staff.<sup>49</sup> Lack of knowledge and understanding of the principles of food safety coupled with behaviors difficulties, are significant barriers to promoting food safety and that supportive activities can make a significant impact on practices of staff.<sup>50</sup> Moreover, some studies showed that elements of

knowledge and motivational systems are important for improving food handling knowledge and practices and that effective training is enhanced by supervisory re-enforcement of the behavioral rules with the personnel.<sup>51</sup> Recently, most studies affirmed that knowledge alone is not sufficient to promote positive attitudes and safe behaviors among food handlers.<sup>52</sup> Therefore, alternative educational strategies, such as those based on motivational health education and promotion models are required.<sup>53-54</sup>

### **Methodology**

Research limitation is focusing on three components 1) Kitchen staff 2) Economy hotels 3) Cairo and Giza governorates. Food safety evaluation is implemented particularly for kitchen staff because they handle food through 4 critical stages: receiving food from stores, preparing food for cooking, cooking food and storing cooked food for service. Economy hotels have been chosen as they accommodate middle class guests that represent an important segment of incoming tourists.

Cairo and Giza have been selected as they are considered very popular leisure and business destination in Egypt. The total number of economy hotels in Cairo and Giza is 58 hotels: 18 four star hotels and 40 three star hotels.<sup>55</sup> Food safety evaluation is done in 12 economy hotels in Cairo and Giza: 7 hotels in Cairo and 5 hotels in Giza. They represent approximately 20% of the total economy hotels in Cairo and Giza. Sample selection regards variation in star classification as it includes 6 three star hotels and 6 four star hotels. It also considers variation in geographical distribution: 2 hotels in Pyramids, 2 hotels in Mohandessin, 1 hotel in Dokki, 4 hotels in downtown, 1 hotel in Zamalek, 1 hotel in Maadi and 1 hotel in Heliopolis.

The following three methodical instruments are employed to evaluate the food safety knowledge, attitudes and practices (KAP) of kitchen staff:

- Interview with Executive Chefs: The purpose of this interview is to measure the qualification of chefs and evaluate the application of food safety or HACCP system in the visited hotels. It also estimates the effectiveness of food safety training courses in increasing food safety KAP. Appendix A. lists the 9 questions directed to the executive chefs of the visited hotels.
- Food Safety Checklist: It contains 10 food safety criteria that measure the basic food safety AP of kitchen staff. The checklist is built upon 3 food safety checklists used in well-known hospitality organizations. Information obtained through observation and questioning. Researchers spent approximately one hour at the kitchen of each hotel to observe the food safety practices of kitchen staff during operation. For further explanation, go to Appendix B.
- Food Safety Test: The food safety test contains 20 questions with three different questioning techniques: Multiple choices, true or false answer and complete the blank spaces. The test is prepared through using 2 references: one academic text book and one training guide. Appendix C provides detailed information about the test. Total number of respondents reaches 36 chefs (3 chefs per hotel).

The grade level is utilized in the research to be the measurement system for providing the final evaluation of both food safety checklist and test. The grade level for the checklist is calculated by the % of frequently positive answers. The grade level for the test is calculated by the % of total correct answers and points obtained as follows:

- Excellent: 90-100%
- Good: 75-89%
- Fair: 50-74%
- Poor: 25-49%
- Very Poor: Less than 25%

This criterion of grading is borrowed from the evaluation system used in Human Resources Development and Training Unit of the Egyptian Tourism Federation so as to be an accredited reference for evaluation.

### **Analysis**

#### **Analysis of the Interview with Executive Chefs**

It consists of 9 questions directed to the executive chef of each visited hotel to have a total number of 12 respondents. It provides data about staff education, common food safety mistakes, and existence of a formal food safety policy or HACCP system as well as the effectiveness of conducted food safety training courses.

First: Kitchen Staff Education

According to responses, it is clear that only 33.3% of executive chefs are holders of education certificates specialized in hotels and tourism services and all of them have not developed their education to a higher academic level. Table 1 demonstrates in details the education certificate of interviewed executive chefs and highlighting the specialized certificates with shading.

**Table (1): Education Certificates of Executive Chefs**

Type of Education Certificate	Specialization	Number of Holders
Secondary Technical Education Diploma – Agriculture Section	Unspecialized	2
Secondary Technical Education Diploma – Industrial/Architecture Section	Unspecialized	4
Secondary Technical Education Diploma – Hotels and Tourism Services Section – Kitchen Dept.	Specialized	3
Above Medium Technical Education Diploma of Tourism and Hotels (2 year-technological institute) – Kitchen Dept.	Specialized	1
Preparatory school Education	Unspecialized	2
<b>Total</b>		<b>12</b>
<b>Total number of executive chefs holding specialized education certificates = 4</b>		
<b>% of Executive chefs holding specialized education certificates = 33.3%</b>		

The total numbers of cooks working in the 12 visited hotels reach 96 chefs. They represent the total number of kitchen staff already employed at the 12 hotels. Executive chefs' replies clarified the fact that 62 chefs, representing 64.5% of the total number of employed chefs, are holders of specialized certificates. For more details, see table 2 that classifies chefs' education into specialization and highlighting the specialized certificates with shading.

**Table (2): Classification of chefs' education into specialization**

Type of Education Certificate	Specialization	Number of Holders
Preparatory School Education	Unspecialized	4
Thanawya Amma	Unspecialized	7
Secondary Technical Education Diploma – Industrial/Architecture/Commerce Section	Unspecialized	14
Secondary Technical Education Diploma – Hotels and Tourism Services Section – Kitchen Dept.	Specialized	18
Advanced Secondary Technical Education Diploma – Hotels and Tourism Services Section – Kitchen Dept. (5 Years)	Specialized	5
Above Medium Technical Education Diploma of Tourism and Hotels (2 year-technological institute) – Kitchen Dept.	Specialized	18
Bachelor of Commerce	Unspecialized	3
B.A of Arts – Arabic Language/Geography/Eastern Languages Dept.		3
B.A of Laws	Unspecialized	2
Bachelor of Agriculture – Milk Products Section	Unspecialized	1
Bachelor of Tourism and Hotel Management (Colleges and High Institutes)	Specialized	21
<b>Total</b>		<b>96</b>
<b>Total number of chefs holding specialized education certificates = 62</b>		
<b>% of total executive chefs holding specialized education certificates = 64.5%</b>		

Second: The existence of formal food safety/HACCP system

Only one hotel has a formal food safety policy and a written food safety operation standards as this hotel belongs to a Spanish chain of hotels. Most of the executive chefs see that this system is useless as food safety practices come through experience and food safety information are kept in their minds which is better than paperwork. According to their point of views, it is enough to have the training manuals which are the main food safety guidelines.

### Third: Common Food Safety Mistakes

According to interviewees' answers, the following are the most common food safety mistakes:

- Errors in thawing process: sometimes staff leaves frozen products to be thawed at room temperature for a long time so that food could be spoiled.
- Uncovered dishes: kitchen staff often forgets to cover some cooked food items which surely let them exposed to dust and insects.
- Spoiled sauces: sometimes staff forgets to store cold sauces in fridges immediately after preparation so that it is rotten after one hour.
- Buffet errors: sometimes staff does not maintain the hot temperature of cooked food such as meat, fish and eggs in buffet. Consequently, food is exposed to many hazards.

To deal with such errors, executive chefs confirmed that they just inform their staff about their mistakes and instruct them the correct food safety processes.

### Fourth: Food Safety Training Courses:

In accordance with executive chefs' replies, the following findings have been declared:

- All of executive chefs and kitchen staff have attended the food safety training courses conducted by the Egyptian Tourism Federation (ETF), Crystal and SGS associations.
- All of the training courses are certified i.e. trainees are tested at the end to certify their attendance and understanding of the course.
- ETF training courses last for 9 days. Crystal training courses last for 3 days. SGS training courses last for 5 days.
- Newly recruited staff is the first candidates nominated to join such training courses.
- Training courses are effective due to the following reasons:
  - They provide basic information about food safety and protection
  - They increase staff awareness about hazards of bacteria and factors leading to growth
  - They instruct trainees about the correct food safety processes
  - They train staff about HACCP system and application

However, there are no refreshment courses to remind chefs with the knowledge gained during training. This is why most of chefs almost forget the key food safety information a long time after training.

### Fifth: Main difficulties hindering food safety guarantee

All of executive chefs confirmed that the shortage in financial resources hinders the hotel to make new maintenance for fridges and dry stores which affects negatively the correct food safety application. Moreover, the current tourism crises, which certainly decrease hotels' sales and revenues, pushed hotels to deduct the costs paid on kitchen resources like buying new protective clothing, new thermometers and separate equipments for using safely the uncooked raw materials.

### Analysis of Food Safety Checklist:

It includes key food safety issues which are 1) maintaining the appropriate temperature of cooked and uncooked food 2) covering and storing unwrapped cooked food 3) testing food condition in terms of temperature, shape, smell and flavor before and during cooking 4) wearing protective clothing while handling cooked and uncooked food 5) implementing the washing and sanitizing steps for hands, equipment and tools. This checklist represents the essential requirements in kitchen to prevent food contamination and poisoning. Table 3 demonstrates the analysis of food safety checklist.

**Table (3): Analysis of Food Safety Checklist**

Ser.	Food Safety Criterion	Frequency of Positive answers
1	Checking the temperature of incoming food items	7
2	Freshly cooked food that will be used later is rapidly cooled in a fridge at 5°C or colder	12
3	Freshly cooked food are stored at 63°C or hotter if it is to be served	12
4	Covering and storing cooked food immediately before serving	10
5	Using digital probe thermometers to test core food temperature, and cleaning and disinfecting probes thoroughly between each use	0
6	Washing hands before and after touching raw and cooked food	9
7	Using separate equipment for raw and cooked foods	2
8	Using gloves when touching or distributing unwrapped foods and washing hands before and after using gloves	0
9	Using protective clothing and a cap (hair restraint) when touching or distributing unwrapped foods	2
10	Wearing a clean uniform, when working in food production	3
11	Cleaning and sanitizing work surfaces after each task	4
12	Keeping work area and equipment cleans all working time	5
13	Checking safety conditions of foods (expiry date, temperature, shape, smell and flavor) before cooking food	6
14	Testing food away from pans and dishes and not using finger while testing food	4
15	Using clean spoon when testing food and cleaning it after each use	4
Total mark of frequent positive answers= 80		
Expected Full mark for total positive answers= 12x15= 180		
% of positive answers= 80/180%= 44.4%		
<b>Final Grade= Poor</b>		

Furthermore, the following food safety defects, that reflect bad behavior of kitchen staff, have been noticed in most of visited hotels, starting from the repeatedly observed ones:

- The kitchen floor and surfaces of 10 visited hotels is not clean. It contains some food remains like bread crumbs, vegetable pieces and unused cold cuts.
- The uniform of kitchen staff is very old with some tears and stains. This defect has been observed in 8 visited hotels.
- Fridges are not clean and disordered in 7 visited hotels.
- Dry stores of 4 visited hotels are unacceptable since dust is seen on shelves.
- Some insects have been noticed in 3 visited hotels
- Some bad habits in 2 visited hotels have been seen like rubbing head and eyes while preparing food for service.

#### **Analysis of Food Safety Test for Kitchen Staff**

It quantifies the fundamental food safety knowledge of kitchen staff illustrated in the following: 1) factors leading to bacteria growth in food 2) reasons behind food contamination 3) methods of preventing food contamination 4) types of highly perishable food 5) storage conditions of different food segments 6) healthy procedures of maintaining hot, cool and freezing food 7) Hygienic food handling habits.

First: Analysis of “Multiple Choices” and “True or False” Questions. Table 4 demonstrates in details the analysis of the 10 “Multiple Choices” and the 5 “True or False” questions.

**Table (4): Analysis of “Multiple Choices” and “True or False” Questions**

Quiz No.	Measured Knowledge	Frequency of replied correct answers
1	Time taken for bacteria to multiply	17
2	Temperature dangerous zone (TDZ)	18
3	Types of pests and rodents	22
4	Examples of chemical contamination	18
5	Examples of physical contamination	19
6	Types of highly perishable food	16
7	Types of food spoiled by yeast growth	23
8	The temperature of keeping food hot	19
9	The correct place of storing uncooked food in fridges	13
10	The temperature of freezing	25
11	Maintenance temperature of hot cooked food	20
12	Ways of bacteria growth	29
13	The correct temperature of chilled food	20
14	Humans are most common causes of contamination	28
15	The healthy condition of thawing	20
Total mark of frequent replied correct answers= 210		
Expected full mark of total correct answers= 36x15= 540		
% of frequent replied correct answers= 210/540= 38.8%		
<b>Final Grade= Poor</b>		

Second: Analysis of “Complete the Blank Spaces” Questions:

Table 5 conveys the analysis of the 5 “Complete the Blank Spaces” questions. Quizzes are measured by summing the total number of points obtained in each quiz. Each point is calculated by completing the spaces as follows:

- 1 point: For completing the whole blank spaces correctly
- ½ point: For completing 50% of the blank spaces correctly
- ¼ point: For completing 25% of the blank spaces correctly
- Zero point: For completing no spaces or completing the whole blank spaces incorrectly

**Table (5): Analysis of “Complete the Blank Spaces” Questions**

Quiz No.	Measured Knowledge	Sum of obtained Points
16	Factors leading to bacteria growth in food	16.5
17	Causes of food contamination	13
18	Actions to prevent food poisoning	18.5
19	Suitable storage conditions for food	18
20	Types of highly contaminated food	24
<i>Total sum of obtained points</i>		<i>90</i>
Total sum of obtained points= 90		
Expected full mark of obtained points= 36x5= 180		
% of total obtained points= 90/180%= 50%		
<b>Final Grade = Fair</b>		

Third: The Final Evaluation of the food safety test

Table 6 clarifies the analysis of the whole food safety test that contains 20 questions to provide the final evaluation.

**Table (6) Analysis of the whole food safety test**

Item	Figure
Total mark of replied correct answers and obtained points	210 + 90 = 300
Expected full mark of correct answers and obtained points	540 + 180 = 720
% of total mark of correct answers and obtained points	300/720 = 41.6%
<b>Final Grade = Poor</b>	

**Findings**

According to previous analysis, it has been conveyed that food safety KAP of kitchen staff are poor due to the following:

- Most of executive chefs, who supposed to be the leaders of kitchen department, are holders of unspecialized education certificates. Moreover, all of them did not develop their educational level. This implies that their KAP stem from experience only with no scientific or academic background. Although the majority of subordinate kitchen chefs are graduated from tourism and hotels educational associations, their KAP are not rich enough since their leaders are not holders of specialized certificates.
- Most of visited hotels do not have food safety policy or even a written food safety operation standard since executive chefs ignore the significance of such system. Consequently, food safety practices executed haphazardly with no system.
- Chefs of visited hotels have poor food safety attitudes and practices. This is exemplified in the following critical food safety mistakes:
  - No regular checking of incoming food items
  - No use of thermometer to check and control food temperature
  - No use of separate equipment for handling uncooked food items
  - Less use of protective clothing
  - No regular cleaning and sanitization of surfaces
  - Rubbing and scratching heads and nose while preparing food
  - Incorrect thawing process that causes spoilage of raw food
  - No covering of cooked food that make it exposed to insects and dust
- Kitchen staff of visited hotels have poor knowledge as they are unaware of the basic food safety information such as the following:
  - The correct place of storing uncooked food in fridges
  - Time taken for bacteria to multiply
  - Factors leading to bacteria growth in food
  - Causes of food contamination
- As a result of the current tourism crisis and low profitability, hotels' managers are unable to assign a budget for purchasing protective clothing and separate tools and utensils for handling uncooked food to ensure food safety application. Moreover, shortage in finance impedes the implementation of pest control and maintenance programs.
- Food safety training courses are effective but they lack a regular refreshment programs to remind kitchen staff with the most significant food safety KAP and update them with recent food safety technology.

**Recommendations**

To develop food safety KAP of kitchen staff, the research has recommended a plan that corresponds to education system, training programs, economy hotels' management and authorized ministries:

*First:* Recommendations Related to Education: Food safety academic courses within tourism and hotel schools, colleges and institutes should be added with practical parts as theoretical parts are not enough. Moreover, there should be an obligatory practical test, besides the theoretical one, as a pre-requisite condition for students' success. This is to make sure that students acquire acceptable food safety KAP.

*Second:* Recommendations Related to Food Safety Training Activities:



Food safety training programs, which already provided by different training associations, should be supported with refreshment courses as well as monitoring and follow up agenda. This is to guarantee the continuation of the correct food safety application in hotel establishments as well as to ensure that kitchen staff maintains the appropriate food safety KAP.

*Third:* Recommendations Related to Authorized Associations: The Ministry of Tourism has to issue a decree for specifying the food safety qualification of the executive chefs in hotel establishments. For example, the executive chef must be a holder of a recognized food safety certificate or an accredited academic qualification in culinary or food production. This law will assure the food safety competence of executive chefs. Furthermore, cooperation should be made between the Ministry of Tourism and Ministry of Health to provide free food safety manuals and booklets that cover the basic food safety issues and distributed to hotel establishments for the purpose of developing food safety KAP of the staff. This is besides the arrangement of short courses or seminars conducted to food handlers in economy hotels with low participation fees so as to assist in acquiring the essential food safety KAP.

*Fourth:* Recommendations Related to Economy Hotels' management

Economy Hotels' management has to prepare a food safety instruction guide covering full information about personal hygiene, food contamination and food safety handling processes. In addition, the daily briefing with kitchen staff must include the food safety topics with special stress on the common mistakes of food handlers to be avoided and evaded in the future during operation.

Additionally, food safety operational standards should be created by food and beverage managers containing the food safety rules and regulations. It is recommended that these standards should be benchmarked to a number of chain hotels' standards and, simultaneously, matching economy hotels' food safety conditions and circumstances.

## References

- <sup>1</sup> Food and Drug Administration (FDA) (2004) FDA report on the occurrence of foodborne illness risk factors in selected institutional foodservice, restaurant, and retail food store facility types. Food and Drug Administration
- <sup>2</sup> Enke, A.; Briley, M.; Curtis, S.; Greninger, S. and Staskel, D. (2007) Quality management procedures influence the food safety practices at childcare centers. *Early Childhood Education Journal*, 35 (1), 75–81.
- <sup>3</sup> Motarjemi, Y. and Kaferstein, F. (1999) Food safety, hazard analysis and critical control point and increase in foodborne diseases: a paradox? *Food Control*, 10 (5), 325–333.
- <sup>4</sup> World Health Organization (WHO), (2000) Foodborne disease: a focus for health education. World Health Organization conference: Geneva
- <sup>5</sup> Worsfold D., (2001) Food safety behavior in butchers' shops, *Nutrition & Food Science*, 31(1), 13-18.
- <sup>6</sup> Sun Y. and Ockerman, H., (2005) A review of the needs and current applications of HACCP system in foodservice areas. *Food Control*, 16(4), 325-332.
- <sup>7</sup> Seaman P. and Eves A., (2006) Management of food safety: the role of food hygiene training in the UK service sector. *International Journal of Hospitality Management*, 25 (2), 278-296.
- <sup>8</sup> Egan M.; Raats M.; Grubb S.; Eves, A.; Lumbers, M.; Dean, M. and Adams M.R. (2007) A review of food safety and food hygiene training studies in the commercial sector. *Food Control*, 18, 1180-1190
- <sup>9</sup> Seaman P. (2010) Food Hygiene Training: Introducing the Food Hygiene Training Model. *Food Control*, 21,381-387
- <sup>10</sup> Kuo, H.; Schmid, D.; Jelovcan, S.; Pichler, A.; Magnet, E.; Reichart, S. and Allerberger, F. (2009) A foodborne outbreak due to norovirus in Austria, 2007. *Journal of Food Protection*, 72 (1), 193–196.
- <sup>11</sup> Jones T. and Angulo F., (2006) Eating in restaurants: A risk factor for foodborne disease? *Clinical Infectious Diseases*, 43 (10), 1324–1328.
- <sup>12</sup> Simelane, N. (2005) HIV/AIDS Knowledge, Attitudes and Risky Sexual Behaviors of College Students at Nazarene Teacher Training College in Swaziland: A Descriptive Study. Unpublished Thesis, University of the Western Cape.
- <sup>13</sup> Rennie, D. (1995) Health Education Models and Food Hygiene Education, *Journal of Royal Social Health*, 115 (1), 75-79.
- <sup>14</sup> Ehiri, J; Morris, G. and McEwen, J. (1997) Evaluation of a Food Hygiene Training Course in Scotland, *Food Control*, 8 (2), 137-147.

- <sup>15</sup> Glanz, K.; Lewis, F. and Rimer, B. (2002) *Health Behavior and Health Education: Theory Research and Practice*. San Francisco: Wiley and Sons.
- <sup>16</sup> Shisana, O. and Simbayi, L. (2002) *Nelson Mandela/HSRC Study of HIV/AIDS: South African National HIV Prevalence, Behavioral Risks and Mass Media*. Cape Town: HSRC.
- <sup>17</sup> Keller, J. (1998) *Attitude is everything*. New York: INT.
- <sup>18</sup> Kalua, F. (2002) *The Relationship Between Knowledge, Attitudes and Practices of Caregivers and Food Hygiene at Day Care Centers*, Unpublished Dissertation. Technikon Pretoria.
- <sup>19</sup> Rutter, D. and Quine, L. (2002) *Changing Health Behavior: Intervention and Research with Social Cognition Models*, Open University Press. Buckingham
- <sup>20</sup> Ajzen, I. (2002) Perceived Behavioral Control, Self-Efficacy, Locus of Control, & the Theory of Planned Behavior, *Journal of Applied Social Psychology*, 32: 665- 680.
- <sup>21</sup> Cushman, J.; Shanklin, C. and Niehoff, B. (2001) Hygiene practices of part-time student employees in a university foodservice operation, *The Journal of the National Association of College & University Food Services*.  
Available at: [http://www.nacufs.org/resources/publications/journal\\_2001.pdf](http://www.nacufs.org/resources/publications/journal_2001.pdf)
- <sup>22</sup> Bas, M.; Ersun, A. and Kivanc, G. (2004) The evaluation of food hygiene knowledge, attitudes and practices of food handlers in food businesses in Turkey. *Journal of Food Control* 17: 317-322.
- <sup>23</sup> Lynch, R.; Elledge, B.; Griffith, C. and Boatright, D. (2003) A comparison of food safety knowledge among restaurant managers, by source of training and experience in Oklahoma City, Oklahoma. *Journal of Environmental Health*, 66 (2), 9-14.
- <sup>24</sup> Clayton, D. and Griffith, C. (2004) Observation of food safety practices in catering using notational analysis, *British Food Journal*, 106 (3), 211 - 227
- <sup>25</sup> Schwartz, N. (1975) Nutrition Knowledge, Attitude, and Practices of High School Graduates, *Journal of American Dietary Association*, 66 (1), 28-31.
- <sup>26</sup> Jenkins-McLean, T.; Skilton, C. and Sellers C. (2004) Engaging food service workers in behavioral change partnerships, *Journal of Environmental Health*, 66 (9), 15-19.
- <sup>27</sup> Lin, S. and Sneed, J. (2005) University Foodservice Employees Food Safety Knowledge, Attitudes, Practices, and Training. *Journal of Foodservice Management and Education*,  
[Online], Available: [http://www.fsme.org/pdf/JFSR&E\\_manuscript\\_2004002.pdf](http://www.fsme.org/pdf/JFSR&E_manuscript_2004002.pdf)
- <sup>28</sup> McKenzie-Mohr, D. and Smith, W. (1999) *Fostering Sustainable Behavior: An Introduction to Community-Based Social Marketing*. Gabriola Island, BC, Canada: New Society Publishers.
- <sup>29</sup> Meer, R. and Misner, S. (2000) Food Safety Knowledge and Behavior of Expanded Food and Nutrition Education Program Participants in Arizona, *Journal of Food Protection*, 63 (12), 1725-1731.
- <sup>30</sup> Haapala, I. and Probart, C. (2004) Food safety knowledge, perceptions, and behaviors among middle school students, *Journal of Nutrition Education and Behavior*, 36 (2), 71-76.
- <sup>31</sup> Green, L. and Selman, C. (2005) Factors impacting food workers' and managers' safe food preparation practices: A qualitative study, *Food Protection Trends*, 25(12), 981-990.
- <sup>32</sup> Green, L.; Selman, C.; Banerjee, A.; Marcus, R.; Medus, C.; Angulo, F.; Radke, V.; Buchanan, S. and EHS-working group. (2005) Food service workers' self-reported food preparation practices: an EHS-Net study.
- <sup>33</sup> Howes, M.; McEwen, S.; Griffiths, M. and Harris, L. (1996) Food Handler Certification by Home Study: Measuring Changes in Knowledge and Behavior, *Dairy Food Environment Sanitation*, 16(7), 737-744
- <sup>34</sup> Hwako, W.(2011) Food sanitation knowledge, Attitude, and Behavior for the university Restaurants Employees, *Food and Nutrition Science*, 2 (7), 744-750
- <sup>35</sup> Nee, S. and Sani, N. (2011) Assessment of Knowledge, Attitudes and Practices (KAP) Among Food Handlers at Residential Colleges and Canteen Regarding Food Safety, *Sains Malaysiana Journal*, 40(4), 403-410

- <sup>36</sup> AbdPatah, M.; Issa, Z. and Nor, K. (2009) Food Safety Attitude of Culinary Arts Based Students in Public and Private Higher Learning Institutions (IPT), *International Education Studies*, 2 (4), 168-178
- <sup>37</sup> Yarrow, L.; Remig, V. and Higgins, M. (2009), Food safety education intervention positively influences college students' food safety attitudes, beliefs, knowledge, and self-reported practices. *J. of Environ. Health*, 71: 30-35.
- <sup>38</sup> World Health Organization (WHO), (1996) *Food Safety Issues: Essential Safety Requirements for Street Vended Food* (Revised edition), World Health Organization. Geneva.
- <sup>39</sup> Food and Agricultural Organization (FAO), (1997) *Essential Safety Requirements for Street-Vended Foods*, (revised edition), FAO Food and Nutrition Paper
- <sup>40</sup> Clayton, D.; Griffith, C.; Price, P. and Peters, A., (2002) Food Handlers' Beliefs and Self-reported Practices. *International Journal of Environmental Health Research*, 12(1):25-39.
- <sup>41</sup> Todd, E.; Greig, J.; Bartleson, C. and Michaels, B. (2007) Outbreaks where Food Workers have been Implicated in the Spread of Foodborne Disease. Part 3. Factors Contributing to Outbreaks and Description of Outbreak Categories. *J. Food Prot.* 7: 2199–2217.
- <sup>42</sup> Incidence of Foodborne Illness, (2010) Centers for Disease Control, Foodborne illness Web Page [Online], Available at: <http://www.cdc.gov/Features/dsFoodborneIllness>.
- <sup>43</sup> World Health Organization (WHO). (2007). *Five Keys to Safer Food Manual*. World Health Organization, Geneva, Switzerland.
- <sup>44</sup> Rennie, M, (1994) Evaluation of Food Hygiene Education. *British Food Journal*, 96 (11):20-25
- <sup>45</sup> Wallace, C, (2001) Effective HACCP training, in Mayes, T. and Mortimore, S. (Eds), *Making the most of HACCP*, Woodhead Publishing, Cambridge, pp. 213-231
- <sup>46</sup> Ramnauth, M.; Driver, F. and Vial, P. (2008) Food safety management in the fish industry in Mauritius: knowledge, attitude and perception, *British Food Journal*, 110(10), 989-1005.
- <sup>47</sup> Powell, S.; Attwell, R. and Massey, S. (1997). The impact of training on knowledge and standards of food hygiene-a pilot study. *International Journal of Environmental Health Research* 7: 329-334.
- <sup>48</sup> Coleman, P. and Roberts, A., (2005) Food hygiene training in the UK: A time for change. *Journal of Food Service Technology* 5: 17-22.
- <sup>49</sup> Campbell, M.; Gardner, C.; Dwyer, J.; Isaacs, S.; Krueger, P. and Ying, J. (1998) Effectiveness of Public Health Interventions in Food Safety: A Systematic Review. *Canadian Journal of Public Health*, 89(3), 197-202.
- <sup>50</sup> Rudder, A. (2006) Food Safety Risk Assessment of Ethnic Minority Food Retail Businesses, *Food Control*, 17(3), 189-196.
- <sup>51</sup> Nieto-Montenegro, S.; Brown, J. and La Borde, L. (2008) Using the Health Action Model to Plan Food Safety Educational Materials for Hispanic Workers in the Mushroom Industry. *Food Control*, 17(10), 757-767.
- <sup>52</sup> Ehiri, J. and Morris, G. (1996) Hygiene training and education of food handlers: Does it work? *Ecology Food Nutrition* 35: 243-251.
- <sup>53</sup> Angelillo, I.; Viggiani, M.; Greco, R. and Rito, D. (2001) HACCP and food hygiene in hospital: Knowledge, attitudes and practices of food services staff in Calabria, Italy. *Infection Control Hospital Epidemiology* 22: 1-7.
- <sup>54</sup> Askarian, M., Kabir, G.; Aminbaig, M.; Memish, Z. and Jafari, P. (2004) Knowledge, attitudes, and practices of food service staff regarding food hygiene in Shiraz, Iran. *Infection Control Hospital Epidemiology* 25: 16-20.
- <sup>55</sup> Hotel Guide (2012), Egyptian Hotel Association (EHA)

**Appendix A**Interview with Executive ChefsFirst: Kitchen Staff Education:

1. What is your education?
2. Did you further develop your education to a higher academic level?
3. How many chefs do you have in kitchen department? What is their education?

Second: The Existence of Formal Food Safety System

4. Do you have a written food safety policy, plan, product protection program, risk management plan, HACCP, Sanitation Standard Operating Procedures (SSOPs) or any other food safety systems? If no, pls. state the reason.

Third: Common Food Safety Mistakes

5. What are the common mistakes done by kitchen staff in your hotel? How can you handle such mistakes?

Fourth: Food Safety Training Courses

6. Do you personally attend training courses in food safety or HACCP?
7. Does kitchen staff attend any training in food hygiene and safety? If yes, answer the following:
  - How many persons attend the course
  - Evaluate the effectiveness of such training
  - What are the disadvantages of such training
8. What do you do with the new staff to inform them about food safety?

Fifth: Main difficulties hindering food safety guarantee

9. What are the main difficulties hindering food safety guarantee in your hotel?

## Evaluating the Food Safety Knowledge, Attitudes and Practices (KAP) of Kitchen Staff in

### Appendix B

#### Food Safety Checklist for Kitchen staff

##### قائمة مراجعة للعاملين بقسم المطبخ

Ser.	Food Safety Criterion مقياس سلامة الغذاء	Yes نعم	No لا	Comments تعليقات
1	Checking the temperature of incoming food items يتم مراجعة درجة حرارة الغذاء المستلم من المخازن			
2	Freshly cooked food that will be used later is rapidly cooled in a fridge at 5°C or colder الغذاء الطازج الذي يستخدم لاحقاً يتم تبريده بسرعة في ثلاجة درجة حرارتها 5 درجة مئوية أو أقل			
3	Freshly cooked food are stored at 63°C or hotter if it is to be served الغذاء المطهى الطازج يتم حفظه في درجة حرارة 63 درجة مئوية أو أكثر قبل خدمته			
4	Covering and storing cooked food immediately before serving يتم تغطية وتخزين الطعام المطهى قبل خدمته			
5	Using digital probe thermometers to test core food temperature, and cleaning and disinfecting probes thoroughly between each use يتم قياس درجة حرارة الغذاء من خلال الترومومتر كما يتم تنظيفه وتطهيره بعد كل عملية من استخدامه			
6	Washing hands before and after touching raw and cooked food يتم غسل الأيدي قبل وبعد لمس الطعام المطهى والطعام الغير مطهى			
7	Using separate equipment for raw and cooked foods يتم استخدام أدوات مخصصة للطعام الغير مطهى وأدوات أخرى مخصصة للطعام المطهى			
8	Using gloves when touching or distributing unwrapped foods and washing hands before and after using gloves يتم استخدام القفازات عند لمس أو توزيع الطعام الغير مغطى ويتم غسل الأيدي قبل وبعد لبس القفازات			
9	Using protective clothing and a cap (hair restraint) when touching or distributing unwrapped foods يتم لبس ملابس واقية وكاب (غطاء الرأس) عند لمس وتوزيع الطعام الغير مغطى			
10	Wearing a clean uniform, when working in food production يتم ارتداء ملابس نظيفة عند العمل بمنطقة إنتاج الطعام			
11	Cleaning and sanitizing work surfaces after each task يتم تنظيف وتطهير الأسطح بعد نهاية كل عمل			
12	Keeping work area and equipment clean all working time يتم الحفاظ دائماً على نظافة مكان العمل والأدوات			
13	Checking safety conditions of foods (expiry date, temperature, shape, smell and flavor) before cooking food يتم مراجعة سلامة الغذاء (تاريخ الصلاحية، درجة الحرارة، الشكل، الرائحة والنكهة) قبل طهي الطعام			
14	Testing food away from pans and dishes and not using finger while testing food يتم تذوق الطعام أثناء الطهي لإختبار الطعم بعيداً عن أواني الطهي والأطباق مع تجنب لمس الأصابع عند التذوق			
15	Using clean spoon when testing food and cleaning it after each use يتم استخدام ملعقة نظيفة عند تذوق الطعام لإختبار الطعم وتنظيفها بعد الاستخدام			

#### Sources:

1. Food safety checklist, Cairo Marriott Hotel
2. Kitchen staff checklist, Chilis Nile City Restaurant
3. Restaurant Mystery Audit Checklist, Hospitality Industry Integrated Services (HIIS)

**Appendix C**  
**Food Safety Test for kitchen Staff**  
إختبار سلامة الغذاء للعاملين بالمطبخ

1- Which of the following best indicates the time taken for bacteria to multiply into millions of organisms?

1- ما هو الإختيار المناسب من الآتى الذى يعبر عن الوقت الصحيح لإنقسام البكتريا إلى ملايين الخلايا؟

A-	A few minutes	دقائق قليلة
B-	A few hours	ساعات قليلة
C-	A few weeks	أسابيع قليلة
D-	A few days	أيام قليلة

2- Which of the following reflects the temperature at which bacteria are most likely to multiply?

2- ما هو الإختيار الصحيح الذى يعكس درجة الحرارة المناسبة لإنقسام وتكاثر البكتيريا؟

A-	Under 5°C	تحت 5 درجة مئوية
B-	Between 5°C and 63°C	ما بين 5 – 63 درجة مئوية
C-	Above 63°C	أكثر من 63 درجة مئوية
D-	Between zero and 70°C	ما بين 0 – 70 درجة مئوية

3- Which of the following best describes a food pest?

3- ما هي الإجابة الصحيحة التى تصف الآفات التى تضر بالغذاء؟

A-	Rodents	القوارض
B-	Birds	الطيور
C-	Insects and mites	الحشرات والفتران الصغيرة
D-	All of the above	جميع ما سبق

4- Which of the following is an example of a chemical contaminant?

4- إختار من الإجابات التالية المثال الصحيح للتلوث الكيماى

A-	Pathogens	التغير الباثوجينى فى تركيب الخلايا
B-	Pesticides	المبيدات الحشرية
C-	Insect eggs	بيض الحشرات
D-	All of the above	جميع ما سبق

5- Which of the following is an example of physical contaminant?

5- إختار من الإجابات التالية المثال الصحيح للتلوث الطبيعى (الفيزيائى)

A-	Pathogens	التغير الباثوجينى فى تركيب الخلايا
B-	Pesticides	المبيدات الحشرية
C-	Insect eggs	بيض الحشرات
D-	All of the above	جميع ما سبق

6- Which of the following is considered to be a high-risk food?

6- إختار من أنواع الأغذية الآتية ما هو أكثرهم وأسرعهم تلفاً وفساداً

A-	Bread	الخبز
B-	Eggs	البيض
C-	Uncooked rice	الأرز الغير مطهى
D-	Vegetables	الخضروات

7- Which of the following is most likely to be prepared by yeast growth?

7- إختار من أنواع الغذاء الآتية الصنف الذى يتم إعداد من خلال التخمر؟

A-	Jam	المربى
B-	Beer	البيرة
C-	Vinegar	الخل
D-	Bread	الخبز

8- Which of the following best reflects the temperature at which food in hot holding cabinet should be kept?

8- إختار من الإجابات الآتية درجة الحرارة المناسبة لحفظ الغذاء الساخن المطهى

A-	below 63°C	تحت 63 درجة مئوية
B-	above 63°C	فوق 63 درجة مئوية
C-	below 75°C	تحت 75 درجة مئوية
D-	above 75°C	فوق 75 درجة مئوية

9- Which of the following is true about stacking a refrigerator?

9- ما هي الإجابة الصحيحة التي تعبر عن عملية تخزين الثلاجة

A-	Raw foods should always be stored on a higher shelf than cooked foods	الغذاء الغير المطهى يتم تخزينه فى الأرفف التى تعلو الغذاء المطهى
B-	Raw foods should be stored at any place in a refrigerator	الغذاء الغير مطهى يتم تخزينه فى أى مكان بالثلاجة
C-	Raw foods should be stored at the top of the refrigerator	الغذاء الغير مطهى يتم تخزينه فى الرف العلوى بالثلاجة
D-	Raw foods should be stored on a lower shelf than cooked foods	الغذاء الغير مطهى يتم تخزينه فى الأرفف السفلية تحت الغذاء المطهى

10- Which of the following is an appropriate temperature for a freezer?

10- ما هي درجة الحرارة المناسبة للفریزر؟

A-	-18°C	- 18 درجة مئوية
B-	-15°C	- 15 درجة مئوية
C-	-7°C	- 7 درجة مئوية
D-	-2°C	- 2 درجة مئوية

Choose (√) for the correct answer and (X) for the wrong one

ضع علامة (√) أمام العبارة الصحيحة وعلامة (X) أمام العبارة الخاطئة

11- To kill germs, the core temperature of the cooked food must reach 70°C and be kept there for at least 2 minutes before serving ( )

11- لقتل الميكروبات، يجب أن يحفظ الطعام المطهى فى درجة حرارة تصل إلى 70 درجة مئوية ولمدة دقيقتين على الأقل قبل خدمته ( )

12- Bacteria multiply in the food by laying eggs in the food ( )

12- يتم تكاثر البكتيريا عندما تضع بيضها فى الغذاء ( )

13- Chilled foods must be stored at a temperature below 8°C and it is safer to store them at a temperature below 5°C ( )

13- يجب حفظ الطعام البارد فى درجة حرارة أقل من 8 درجة مئوية ولمزيد من الأمان يفضل حفظه فى درجة حرارة أقل من 5 درجة مئوية ( )

14- Humans, represented in cooks, are probably the most common sources of bacterial contamination of food ( )

14- يمثل العنصر البشري وهم الطهاة أكثر مصادر تلوث الغذاء ( )

15- It is safe to re-frozen food after thawing ( )

15- تعتبر عملية إعادة تجميد اللحوم بعد تسييحها عملية آمنة ( )

Answer the following questions: أجب عن الأسئلة الآتية

16- List 4 important factors that make bacteria multiply.

16- أذكر أربعة عوامل هامة تساعد على نمو وتكاثر البكتيريا

-----1-----2-----

-----3-----4-----

17- Mention 3 important causes of food contamination.

17- أذكر ثلاثة أسباب للتلوث الغذائي

-----1  
-----2  
-----3

18- State two important actions should be done to prevent food poisoning.

18- أذكر عمليتين هامتين يجب إتباعهما لمنع التسمم الغذائي

-----1  
-----2

19- Describe the suitable storage conditions for the following items: milk, flour, frozen meat.

19- أذكر الشروط الصحية المناسبة لتخزين الآتي: الألبان – الدقيق – اللحم المجمدة

الألبان: -----  
الدقيق: -----  
اللحم المجمدة: -----

20- List 4 famous highly perishable food items.

20- أذكر أربعة أنواع من الغذاء سريع التلف

-----1  
-----2  
-----3  
-----4

References:

1. Blanch S., (2009), Food Hygiene, British Library Cataloguing in Publication Data
2. NA., (2008), Safe Food - The complete guide for people who work with food, The Stationary Office Limited.

Answer Sheet

1	B
2	B
3	D
4	B
5	C
6	B
7	D
8	B
9	D
10	A
11	✓
12	X
13	✓
14	✓
15	X
16	<ul style="list-style-type: none"> <li>• Time</li> <li>• Warmth</li> <li>• Food</li> <li>• Moisture (water activity)</li> <li>• Acidity</li> </ul>
17	<ul style="list-style-type: none"> <li>• Hands</li> <li>• Raw foods</li> <li>• Pests and rodents</li> <li>• Unclean clothing</li> <li>• Unclean utensils</li> </ul>



18	<ul style="list-style-type: none"> <li>• Cooking</li> <li>• Storing correctly</li> <li>• Washing, rinsing and sterilizing utensils</li> </ul>
19	<ul style="list-style-type: none"> <li>• Milk: Chilling in fridge below 5°C (between 1°C and 4°C)</li> <li>• Flour: Store dry in ventilated and clean dry stores at room temperature</li> <li>• Frozen meat: Store at freezers at -18°C</li> </ul>
20	<ul style="list-style-type: none"> <li>• Raw fish, sea food, meat and poultry</li> <li>• Eggs</li> <li>• Salad</li> <li>• Dairy foods</li> </ul>

#### تقييم معلومات وأفعال وتطبيقات سلامة الغذاء للعاملين بقسم المطبخ في الفنادق الإقتصادية بالقاهرة والجيزة

يهدف البحث إلى تقييم معلومات وأفعال وتطبيقات سلامة الغذاء (Food Safety KAP) للعاملين بقسم المطبخ في الفنادق الإقتصادية بمحافظتى القاهرة والجيزة. وذلك من خلال التعرف على نقاط الضعف وإقتراح خطة للدعم والتطوير. تم تقييم عدد 12 فندقاً إقتصادياً كعينة للبحث والتي تمثل 20% تقريباً من إجمالي عدد الفنادق الإقتصادية في القاهرة والجيزة. تم استخدام 3 أدوات تحليلية وهي: مقابلة شخصية مع الشيف العمومي لكل فندق، قائمة مراجعة سلامة الغذاء بالمطبخ وإختبار لعدد 3 طهاه بكل فندق. تراعى العينة التنوع فى التوزيع الجغرافى والتصنيف الفندقى. وقد أثبتت النتائج أن التقييم العام ضعيف. حيث تتركز نقاط الضعف فى التخزين الخاطئ للغذاء وإتباع طرق غير صحيحة فى عملية التسييح والتداول الخاطئ للغذاء الغير مطهى وعدم الإحتفاظ بدرجات حرارة الغذاء الساخن والبارد. يوصى البحث بتطوير مناهج سلامة الغذاء الأكاديمية بإضافة إمتحان عملى. كما يقترح تنظيم ندوات إرشادية عن سلامة الغذاء من خلال الوزارات المعنية. وفى النهاية، يقترح عمل دليل توجيهى ومقاييس تشغيلية لسلامة الغذاء بالفنادق الإقتصادية.

**الكلمات الدالة:** تقييم ، سلامة الغذاء، قسم المطبخ ، الفنادق الإقتصادية ، القاهرة ، الجيزة