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Good Practices in food handling in Food and Nutrition Services

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Abstract

This study aimed to assess the requirements of the best manufacturing practices in two food and nutrition services located in Vitoria-ES, Brazil. For the assessment of compliance with good manufacturing practices, a checklist proposed by RDC No. 216 of the National Health Surveillance Agency was used, divided into three parts: company identification, evaluation and classification of the establishment. Regarding compliance to the proposed items on the checklist, the adequacy percentage in the unit 1 was 71.81% and in the unit 2 it was 76.36%, being classified in group 2 and group 1, respectively. Among the inadequacies highlighted in both establishments, it can be pointed out: buildings (structure), furniture and fixtures; handlers; storage and transportation of food prepared and prepared food exposure to consumption. It is important to highlight that the presence of a qualified responsible technician is extremely important for the achievement and maintenance of best hygiene practices. The application of a simple tool as the checklist allows evaluating the hygienic-sanitary conditions of units that prepare and serve meals and, from observations, seeking strategies to correct the evident failures.

Key words: Best Manufacturing Practices. Food Service. Food Quality. Food Handling.

Introduction

Food consumption outside the home, either on social issues or for needs related to routine and current lifestyle has contributed to the growth of food service. With the increase in the number of meals offered outside the home, great concern about the quality of food offered to users grows. Million people are directly affected by food-borne diseases (FBD) in the world and the diseases caused by consumption of contaminated food are considered a serious health problem in the world today.[1]

According to the estimate for the year 2014 by the Brazilian Association of Collective Meals, the market of collective meals as a whole provided more than 12 million meals / day, moving a figure of over 18.8 billion reais per year and a daily volume of 5.7 thousand tons of food used.[2]

Among the modalities of food services, there are the food and nutrition services (FNS), considered the work unit or agency of a company that performs activities related to food and nutrition, regardless of the situation it occupies in the entity hierarchy.[3] These establishments are largely frequented by the population, in order to obtain safer food. The demand is related to the recognition by the users, who believe in quality related to nutritional and sensory aspects of food safety in relation to sanitary conditions, the services provided by the suppliers and the amount charged. One of the strategies to achieve a high quality standard is the implementation of Good Handling Practices of food, which aims to establish appropriate procedures to contribute to the sanitary conditions of food prepared in food service.[4,5]

In institutional foodservice, the food can be susceptible to various sources of contamination by micro-organisms related to the manipulation and improper procedures during processing and distribution. In order to ensure safer food, control tools such as best practices and hazard analysis and critical control points (HACCP) have been widely used.[6]

The guarantee of food safety has been discussed and thus studies on hygienic conditions and handling and food preparation practices are relevant. The checklist is a tool that allows to make a preliminary assessment of the sanitary conditions of an establishment producing meals. The initial assessment allows the identification of non-compliances and, from the collected data, to propose corrective measures to adjust the conditions of preparation of meals.

Given the importance of the issue to the health of communities, this study aimed to diagnose compliance with good manufacturing practices in institutional foodservice located in Vitória-ES.

Material and methods

In July 2013, a cross-sectional study in two institutional foodservice located in Vitória-ES was conducted. Initially, those responsible for establishments were contacted by letter of invitation for presenting the research objectives and permission for visitation and assessment was requested.

For the assessment of compliance with good manufacturing practices, a checklist proposed by the Resolution of the National Health Surveillance Agency - ANVISA RDC n° 216/2004 was used,[7] divided into three parts: company identification, evaluation and classification of the establishment. The checklist includes 11 blocks of assessed questions in each unit, totaling 90 items, according to Table 1.

Table 1. Blocks and items present in the checklist of best food handling practices. Vitória-ES, 2013.

BLOCKS	ITEMS
BUILDINGS AND FACILITIES	They are designed so as to allow an orderly flow and no crossings at all stages of food preparation and to facilitate the maintenance, cleaning and, when necessary, disinfection. Access to the facility is controlled and independent, not common to other uses.
	The dimensions of the building and facilities are compatible with all operations. There is separation of the different activities by physical means or by other effective means to avoid cross-contamination.
	The facilities such as floor, wall and ceiling have smooth, waterproof and washable coating. Floors, walls and ceilings are intact, preserved, and free from cracks, leaks, spills, leaks, mold, and peeling, among others and should not transmit contaminants to food.
	The doors and windows are fitted to the stops. The doors of the preparation and food storage area are equipped with automatic closure. The outer openings of the storage areas and food preparation are provided with millimeter screens to prevent access vectors and urban pests. The screens are removable to facilitate periodic cleaning.
	The facilities are supplied with tap water and have connections to the sewer system or septic tank. The drains are siphoned and grilles have device that allows its closure.
	The grease and sewer traps have dimensions compatible with the volume of waste and must be located outside the food preparation and storage area, and present appropriate operating and preservation state.

BLOCKS	ITEMS
BUILDINGS AND FACILITIES	The internal and external areas of the establishment are free from objects in disuse or unusual to the environment, there is no presence of animals.
	The illumination of the preparation area provides the view so that the activities are carried out without compromising hygiene and sensory characteristics of food. Lamps located on the food preparation area are appropriate and are protected against explosion and accidental drops.
	The electrical installations are built-in or protected in outdoor undamaged pipes, to allow the cleaning of environments.
	Ventilation ensures the air renewal and maintenance of the fungus-free environment, fume, smoke, dust, particulate matter, vapor condensation and others that may compromise the sanitary quality of food. The airflow does not focus directly on foods.
	Equipment and filters for air conditioning are preserved. The cleaning of the HVAC system components, the filter changes and scheduled and periodic maintenance of these equipment are recorded and performed according to specific legislation.
	Sanitary facilities and changing rooms do not communicate directly with the preparation area and food storage or cafeterias being kept organized and in proper condition. Exterior doors are equipped with automatic closure.
	The sanitary facilities have toilets and are supplied with products for personal hygiene, such as toilet paper, antiseptic odorless liquid soap or odorless liquid soap and antiseptic product, and paper towels not recycled or other hygienic and safe system for drying hands. The waste collectors are equipped with lid and operated without hand contact.
	There are unique sinks for hand hygiene in the area of manipulation in strategic positions in relation to the food preparation flow and in sufficient numbers to suit all the preparation area. Washbasins have antiseptic odorless liquid soap or odorless liquid soap and antiseptic products, paper towels or other non-recycled toilet system and drying safe hands and collector of paper, activated without hand contact.

BLOCKS	ITEMS
BUILDINGS AND FACILITIES	Equipment, furniture and fixtures that come into contact with food are made of materials that do not transmit toxic substances, odor or taste, as set out in specific legislation. They are kept in adequate condition, are resistant to corrosion and repeated cleaning and disinfection.
	Equipment and fixtures scheduled and periodic maintenance, and instruments or measurement equipment calibration are performed, keeping track of these operations.
	The surfaces of equipment, furniture and fixtures used in the preparation, packaging, storage, transport, distribution and sale display of food are smooth, waterproof, washable and free of roughness, cracks and other imperfections that may compromise its cleaning and may be food contamination sources.
	The facilities, equipment, or furniture and utensils are kept in proper sanitary conditions.
	Cleaning operations are carried out by proven skilled employees and often to ensure the maintenance of these conditions as well as minimize the risk of food contamination.
BUILDINGS AND FACILITIES	The grease traps are cleaned periodically. Disposal of the waste meets the provisions of specific legislation.
	Cleaning operations and, if necessary, disinfection of facilities and equipment when they are not routinely performed, are registered.
	The food preparation area is sanitized immediately after the completion of the work or as often as needed. Precautions are taken to prevent contamination of food caused by cleaning products, by the particulate matter and the aerosols formation.
	Odorants and / or deodorant substances in any of their forms are not used in the areas of food preparation.
	The cleaning products used are regulated by the Ministry of Health. The dilution, contact time and method of use / application of sanitizing products meet the recommended instructions by the manufacturer. The cleaning products are identified and stored in a place reserved for this purpose.

BLOCKS	ITEMS
WATER SUPPLY	The necessary fixtures for cleaning operations are suitable and are available in sufficient number and in good hygiene and conservation. The fixtures used in cleaning facilities are distinct from those used for cleaning parts of equipment and fixtures that get in contact with food.
	Employees responsible for the sanitary facilities cleaning activity wear appropriate and different uniforms from those worn in food handling.
	The steam, when used in direct contact with food or surfaces that get in contact with food, is produced from fresh water and is not a source of contamination.
	The water tank is built and / or coated with materials that do not compromise water quality, according to specific legislation. It must be free of cracks, leaks, infiltration, peeling, among other defects, and in proper state of hygiene and maintenance and should be properly covered.
	The water tank is sanitized, at a maximum interval of six months, and operation records are registered.
WASTE MANAGEMENT	The establishment has identified and intact containers, easy to clean and transport in sufficient number and capacity to contain the waste. They are identified and properly lined with plastic bags.
	Collectors used for disposal of waste from the preparation and food storage areas should be provided with lids activated without hand contact.
	The residues are often collected and stored in location closed and isolated from the preparation area and food storage, in order to avoid contamination outbreaks and vector and urban pests' attraction.

BLOCKS	ITEMS
MANIPULATORS	The manipulators health control is recorded and performed in accordance with specific legislation.
	Manipulators showing lesions and / or symptoms of diseases that can compromise the hygienic and sanitary quality of food are removed from the food preparation activity while these health conditions persist.
	Manipulators have personal hygiene, presenting themselves in uniforms compatible with the activity, preserved and clean. Uniforms are exchanged at least daily and worn exclusively inside the premises of the establishment. Clothing and personal belongings are stored in specific and reserved place for that purpose.
	Manipulators carefully wash their hands to get to work before and after handling food, after any interruption of service, after touching contaminated materials, after using the toilet and whenever deemed necessary.
	Guidance posters to manipulators on proper washing and antisepsis of the hands and other hygiene habits are displayed in easily visible places, including the toilets and washbasins.
	Manipulators do not smoke, talk, sing, whistle, sneeze, spit, cough, eat, handle money or practice other acts that may contaminate food while performing their activities.
	Manipulators wear hair tied and protected by nets, caps or other suitable accessory for that purpose, not being allowed to wear beards. The nails are short and unpolished. During manipulation, all personal adornment objects and makeup should be removed.
	Food manipulators are supervised and regularly trained in personal hygiene, in hygienic handling of food and foodborne diseases. The training is evidenced through documentation.
	Visitors comply with hygiene and health requirements for manipulators.

BLOCKS	ITEMS
RAW MATERIALS, INGREDIENTS AND PACKAGING	The specific food service, the criteria for evaluation and selection of raw material suppliers, ingredients and packaging, and transportation of these materials were carried out in adequate hygiene and conservation conditions.
	The receiving of raw materials, ingredients and packaging is carried out in a protected and clean area. Actions are taken to prevent that those supplies contaminate prepared food.
	Raw materials, ingredients and packaging are subject to inspection and approved at reception. The primary packaging of raw materials and ingredients are intact. The temperature of the raw materials and ingredients that require special storage conditions are checked at reception and storage steps.
	Lots of raw materials, ingredients or disapproved packaging or beyond expiration date are immediately returned to the supplier and, when not possible, they are properly identified, stored separately and sent to final disposal.
RAW MATERIALS, INGREDIENTS AND PACKAGING	Raw materials, ingredients and packaging are stored in a clean and tidy place, to ensure protection against contaminants. They are properly packaged and identified, and their use must comply with the expiration date. For foods exempted from the obligation to indicate the period of expiration, its entry order is observed.
	Raw materials, ingredients and packaging are stored on pallets, and / or shelves, respecting the minimum spacing needed to ensure proper ventilation, cleaning and, when appropriate, local disinfection. Pallets and / or shelves are made of smooth material, resistant, waterproof and washable.
FOOD PREPARATION	Raw materials, ingredients and packaging used for food preparation are in proper sanitary conditions and in accordance with specific legislation.
	The quantity of employees, equipment, furniture and / or appliances available is compatible with volume, diversity and complexity of food preparations.
	During food preparation, actions are taken in order to minimize the risk of cross contamination. Direct or indirect contact between raw foods, ready meal and ready for consumption is avoided.
	Employees who manipulate raw foods carry out the washing and antisepsis of the hands before handling cooked food.
	Raw materials and ingredients characterized as perishable products are exposed to room temperature only for the minimum time required for the preparation, in order not to compromise the hygienic and sanitary quality of food prepared.

BLOCKS	ITEMS
FOOD PREPARATION	When raw materials and ingredients are not entirely used, they are properly packaged and labeled with at least the following information: product name, fractioning date and expiration date after opening or removal of the original packaging.
	Where applicable, before starting food preparation, proper cleaning of the primary packaging of raw materials and ingredients is done, minimizing the risk of contamination.
	The heat treatment ensures that all parts of the food reach at least 70 ° C (seventy degrees Celsius). Lower temperatures are used in the heat treatment as long as the time and temperature combinations are sufficient to ensure the hygienic and sanitary quality of food.
	The effectiveness of the heat treatment is assessed by checking the temperature and time used and, when applicable, the changes in texture and color in the central part of the food.
	For foods that are subjected to frying, beyond the established controls for heat treatment, measures are implemented to ensure that oil and fat used are not a source of food prepared chemical contamination.
	The used oils and fats are heated to temperatures no higher than 180 ° C (one hundred and eighty degrees Celsius), being replaced immediately whenever there are distinct change in physic-chemical and sensory features such as aroma and flavor, and intense foaming and smoke.
	For frozen food, prior to heat treatment defrosting should be carried out in order to ensure adequate heat penetration. When the food manufacturer recommends that it is subjected to heat treatment still frozen, the guidelines on the label are followed.
	Defrosting is carried out in order to prevent that the surface areas of the food remain in favorable conditions for microbial growth. Defrosting is performed under refrigerated conditions at temperatures below 5 ° (five degrees Celsius) or in a microwave oven when food is immediately subjected to cooking.
	The foods subjected to defrosting are kept under refrigeration if not used immediately, and must not be refrozen.
	After being submitted to cooking, food prepared is maintained in time and temperature conditions which do not favor microbial proliferation. For hot storage, foods are subjected to temperature higher than 60 ° (sixty degrees Celsius) for a maximum of 6 (six) hours. For storage under refrigeration or freezing, foods are previously submitted to the cooling process.

BLOCKS	ITEMS
FOOD PREPARATION	The cooling process of a prepared food is performed so as to minimize the risk of cross-contamination and its presence at temperatures favoring microbial growth. The temperature of the cooked food is reduced from 60 ° (sixty degrees Celsius) to 10 ° C (ten degrees Celsius) for two hours. Then, it is stored under refrigeration at temperatures below 5 ° (five degrees Celsius) or freezing at temperature at or below -18 ° C (negative eighteen degrees Celsius).
	The maximum period for consumption of the food prepared and stored under refrigeration at 4 ° C (four degrees Celsius), or lower, is 5 (five) days. When temperatures used are higher than 4 ° C (four degrees Celsius) and below 5 ° C (five degrees Celsius), the maximum consumption period is reduced in order to ensure the hygienic and sanitary conditions of food prepared.
	If the food prepared is stored under refrigeration or freezing, at least the following information is placed in its packaging: name, date of preparation and expiration date. Storage temperature is regularly monitored and recorded.
	When applicable, the foods that are eaten raw are subjected to cleaning process, in order to reduce surface contamination. Products used in food hygiene procedures are regulated in the competent agency of the Ministry of Health and are applied in order to avoid the presence of residues in food prepared.
	The establishment implements and maintains documented control and quality assurance of foods prepared.
STORAGE AND TRANSPORTATION OF FOOD PREPARED	Prepared food maintained in the storage area or awaiting transportation are identified and protected against contaminants. The identification contains at least the name of the product, the date of preparation and expiration date.
	The storage and transportation of food preparation, distribution until the delivery to consumption, takes place in time and temperature conditions that do not compromise their sanitary conditions. The temperature of food prepared is monitored during these stages.
	Food prepared means of transportation are sanitized, and measures are taken to ensure the absence of vectors and urban pests. The vehicles are equipped with cover for cargo protection, they do not carry other cargos that compromise the sanitary quality of food prepared.

BLOCKS	ITEMS
FOOD PREPARED EXPOSURE TO CONSUMPTION	The food prepared areas of display and consummation or cafeterias are kept organized and under appropriate sanitary conditions. Equipment, furniture and fixtures available in those areas are compatible with the activities in sufficient numbers and in appropriate conservation status.
	The manipulators adopt procedures which minimize the risk of food prepared contamination by hand antisepsis and the use of utensils or disposable gloves.
	The equipment required for display or distribution of prepared food under temperature control, are properly sized, and are in adequate hygienic, maintenance and operation conditions. The temperature of the equipment is regularly monitored.
	The food prepared display equipment in the consumption area provides protective barriers that prevent its contamination due to proximity or consumer action and other sources.
	The utensils used in food consumption, such as plates, cups, cutlery are disposable or, when made of non-disposable material, properly cleaned and stored in a protected location.
	The ornaments and plants located in the consumption area or cafeteria does not constitute a source of contamination to prepared foods.
	The area of food service where cash, cards and other means of payment are accepted is reserved. The staff responsible for this activity do not manipulate food prepared, packed or unpacked.
DOCUMENTATION AND REGISTRATION	Best Practices and Standard Operating Procedures (SOP) Manual is provided in food services. These documents are available to employees involved and available to the health authority when required.
	SOPs contain sequential statements of operations and frequency of execution, specifying the name, position and or function of those responsible for the activities. They are approved, dated and signed by the establishment responsible person.
	Records are maintained for a minimum of thirty (30) days from the date of food preparation.
	Food service has SOP related to the following items: a) facilities, equipment and furniture sanitation; b) vector and urban pests integrated control; c) tank cleaning; d) manipulators health and hygiene.

BLOCKS	ITEMS
DOCUMENTATION AND REGISTRATION	SOPs relating to facilities, equipment and furniture cleaning operations contain the following information: the nature of the surface to be sanitized, cleaning method, selected active ingredient and its concentration, contact time of the chemical and / or physical agents used in operation hygiene, temperature and other information that may be necessary. When applicable, the SOP include the equipment dismantling operation.
	SOPs related to integrated vector and urban pests control include the preventive and corrective measures to prevent the attraction, shelter, access and / or the proliferation of vectors and urban pests. In the case of chemical control, the establishment presents document of service executed by specialized company, containing the information established in specific health legislation.
	In the case of SOP regarding the tank cleaning, even when performed by a third party, the service execution certificate is shown.
	SOPs related to manipulators health and hygiene include the steps, the frequency and the active ingredients used in washing and antisepsis of their hands, as well as the measures taken in cases in which the manipulators present lesions in hands, disease symptoms or suspected health problem that might jeopardize the sanitary quality of food. Examinations to which food manipulators are subjected, as well as the timing of their implementation are specified. The manipulators training program on hygiene is described, determining the workload, the program content and the frequency of its realization, keeping record of nominal employee participation.
RESPONSIBILTY	
	The person responsible for food handling activities is the owner or designated employee, properly trained, notwithstanding cases in which there is legal provision for technical liability.
	The person responsible for food handling activities is arguably subjected to training course covering at least the following subjects: a) food contaminants; b) food-borne illnesses; c) food hygienic manipulation; d) Best Practices.

The classification of each restaurant followed the scoring criteria set out in section D of Resolution RDC n° 275/2002 (BRASIL, 2002),[8] namely: Group 1 (76-100% coverage of items); Group 2 (51-75% coverage of items); and Group 3 (0-50% coverage of items). Each of the 11 checklist blocks were also rated, according to this criterion. The institutional foodservice were called "Unit 1" and "Unit 2".

The collected data were stored in Microsoft Excel spreadsheets and analyzed descriptively, with the assistance of the Stata statistical software, version 9.1 (Stata Corp., College Station, United States).

Results and discussion

Regarding the compliance with the proposed items on the checklist, the adequacy percentage in Unit 1 was equal to 71.81% and in Unit 2 it was 76.36; being classified in Group 2 and Group 1, respectively.

The unit 1 distributes 2,000 meals per day, being the distribution system service of all preparations portioned. Unit 2 distributes an average of 5,000 meals per day, with the largest number of meals served at lunch. The distribution system of the meals in the unit was self-service, with the main course / option, juice and dessert portioned.

In Figure 1 and 2, the percentage of suitability and unsuitability to food handling best practices are prepared, per blocks in the evaluated institutional foodservice.

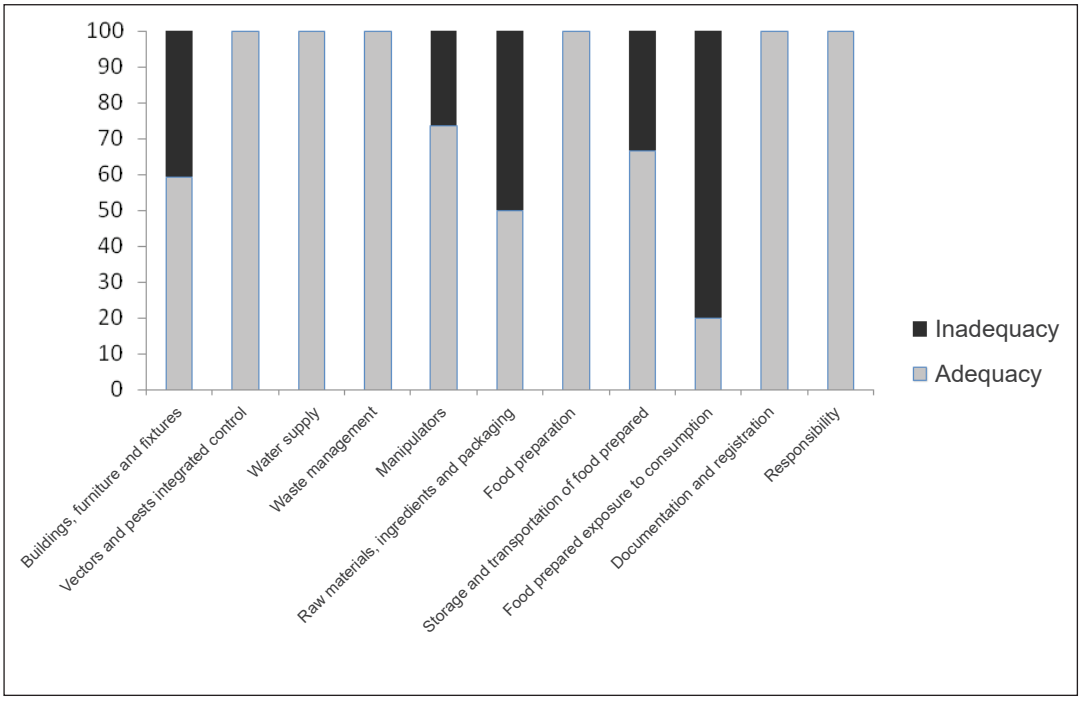

Figure 1. Adequacy percentage and inadequacy to best food handling practices in Unit 1. Vitória-ES, 2013.

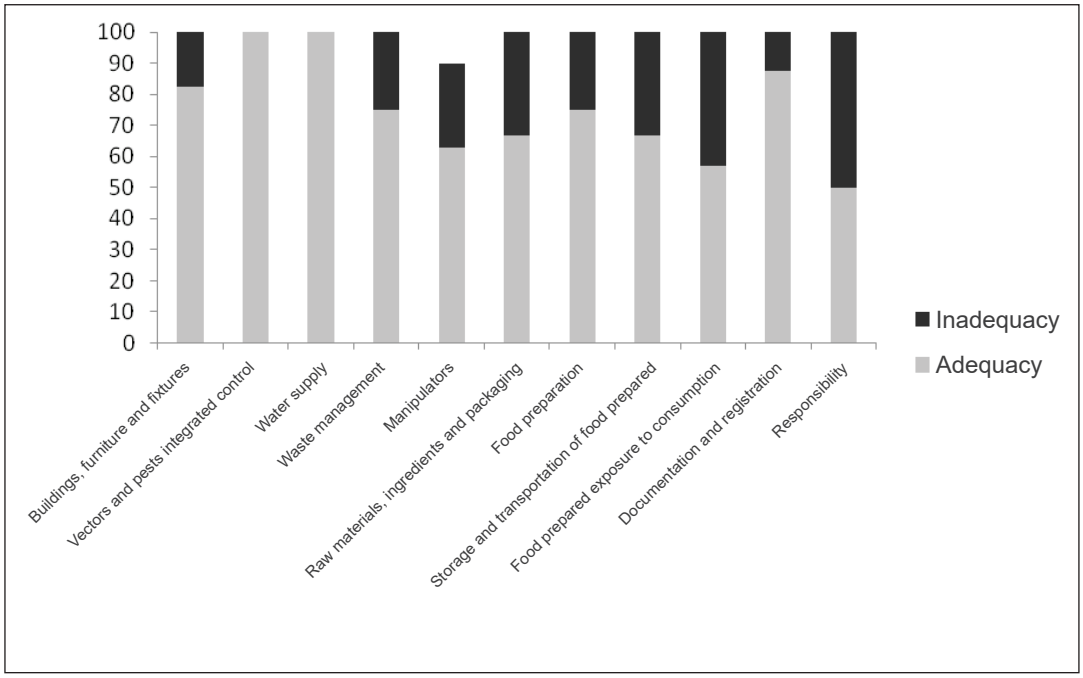

Figure 2. Adequacy percentage and inadequacy to best food handling practices in Unit 2. Vitória-ES, 2013.

Buildings, furniture and fixtures

In Unit 1, the design of the building and facilities were not compatible with all operations, contributing to the risk of cross-contamination, since the place was small and the procedures were carried out close one to another. In in Unit 2 this problem has not occurred, due to the greater suitability of the design. The main inadequacies found in this block are related to physical facilities and ventilation. Among the inadequacies registered in this block, in both units assessed, are: existence of doors without automatic closing, low quality lighting, lack of maintenance of the equipment used in the preparation as well as floors and walls in disrepair.

Non-compliances as objects in disuse (damaged equipment, containers and utensils in disrepair), absence of antiseptic odorless liquid soap or odorless liquid soap and antiseptic products in sinks and white paper towels were also recorded. Objects in disuse may increase the chance of contamination due to possible abrasion of the material and thus enabling the accumulation of food waste. Similar situations were observed by São José and Pinheiro-Sant'Ana [9] in school institutional foodservice.

In a study conducted in the municipality of Duque de Caxias, it was observed that all the institutional foodservice showed non-compliance related to physical structure, leading to cross of dirty and clean areas which may lead to food contamination[9]

According to RDC nº 216/2004,[7] physical facilities such as floor, wall and ceiling must have flat, waterproof and washable coating; doors and windows should be kept adjusted to the stops and there must be exclusive sinks for hand hygiene in the area of handling, in strategic positions. In Unit 1 failures were observed regarding floor condition and walls, both in the preparation of food sector and in the toilets, which had several broken and puffed points.

Fonseca et al.[11] reported the importance of adequacy of buildings, facilities, equipment, furniture and fixtures to support and guarantee the implementation of best practice and quality of food prepared in food service. When edifications and facilities are designed properly, they enable the ordination of the production flow and avoid crossings at all stages of food preparation, contributing to the maintenance, cleaning and disinfection.

In Unit 1, inadequacies as sanitizing storage in inappropriate place, with no materials in sufficient numbers to carry out the cleaning and use of improper uniforms for performing the activity were observed. It was found that there were no sanitizers, and sanitation was being carried out improperly. Consequently, the surfaces had improper conditions for food preparation. Rossi,[12] in a study conducted in Belo Horizonte, considered unsatisfactory the outcome of most of the evaluated commercial restaurants, accounting for less than 50% of adequacy for this block.

In Unit 2 it has been observed that there are no records of cleaning and there were sanitizing failures in the sanitizing dilution procedure used. According to RDC nº 216/2014,[7] the cleaning products used must be regulated by the Ministry of Health. The dilution, contact time and method of use / application of sanitizing products must comply with the instructions recommended by the manufacturer. In addition, the staff responsible for the sanitation activity of the sanitary facilities should wear appropriate uniforms and different from those worn in food handling.

Integrated pest control

In both units, the assessed items were in compliance, unlike the one evidenced by Gomes et al.[13] The authors found that 92.3% of the evaluated units lacked vectors and urban pest integrated control. Thus, the results found in the units 1 and 2 of this study shows that they have adopted measures aiming to prevent the attraction, shelter, access and or proliferation of vectors and urban pests, ensuring the safety of users. The IPC is essential in preventing food poisoning, and one should also consider the feeling of disgust that the presence of animals causes to the users. It can even affect the reputation of the establishment and its officers. Usually, the presence of pests is related to the lack of preventive and corrective measures of the environment, lack of training, and a poor structural planning [14].

Water supply

There was 100% adequacy to items evaluated, namely the use of potable water for food handling, the use of ice made from drinking water and integrate water tank and in excellent condition in the units. The units had Standard Operating Procedures for controlling water potable properties. It is important to remember that water is used in food preparation, as an ingredient, as well as assisting in the sanitation of surfaces and food, so its good quality is essential. The water quality control for any use in food production is needed to avoid potential health risks to consumers of marketed products.[15]

Waste management

There were no non-compliances in Unit 1, however, in Unit 2 it was observed that the containers for the waste storage were not properly identified and lined with plastic bags. Rossi[12] observed that in restaurants rated management conditions were poor and inadequate, with only 33.3% of the items in this block being met.

Garbage is a source of pollution to be controlled due to the fact that food waste favor the appearance of vectors and pests. According to RDC nº 216/2004,[7] waste must often be collected and stored in a closed and isolated location of the food preparation area to avoid sources of contamination and attraction of vectors and urban pests.

Manipulators

For the manipulators evaluation, it is noted that the Units 1 and 2 showed similar percentages of non-compliance (27%). The same was evidenced by São José et al.16 in institutional foodservice in the city of Contagem, Minas Gerais. In both units periodic examinations were not performed, and the head of one of the establishments reported that only tests for admission and dismissal are performed. In Unit 1, the manipulators wore personal clothes during working hours due to delays in the purchase of uniforms. Ensuring appropriate clothing for wearing in the establishment is important to avoid contaminants that may be present in the personal clothing.[18] In Unit 2, there was no appropriate place for safekeeping of personal objects and thus the manipulators kept belongings like cell phones and keys in the pocket or hanging on clothes. We observed, still at this unit, improper habits like talking and coughing during food handling.

Non-compliances found were similar to those observed in the study by Oliveira et al.,[18] in which the manipulators speak and sing during the handling of food, and ate inside the production site. All the facts mentioned above are in disagreement with the proposed in RDC nº 216/2004.[7] According to Marchi et al.,[17] it is important to consider the food manipulator to be an asymptomatic carrier, that is, represent a source of transmission and possibly spread pathogens into the food through contaminated hands.

The food manipulation is a factor which, if not controlled, can be responsible for triggering contamination and affect food safety.[14] In addition, early identification of the occurrence of contaminants manipulators can contribute to the prevention of food contamination.[16]

In Unit 2, there was no food manipulators training record. According to RDC nº 216/2004,[7] the manipulators need to have personal hygiene, wear uniform compatible with the activity, preserved and clean. In addition, food manipulators must be inspected periodically and trained in personal hygiene, food hygienic handling and foodborne illnesses.

Raw materials, ingredients and packaging

Regarding the raw materials, ingredients and packaging, it is noted that unit 1 presented more non-compliance items (50%). Overall, both institutions present no organization of raw materials, to ensure protection against contaminants, expiration date indication and entry and deliver order. In Unit 2, the fresh food were stored in wooden boxes, without sanitation and they were not disposed distant from the walls.

Reolon and Silva[20] reported, in a study involving six restaurants in Medianeira-Paraná, that in most establishments the storage of the raw material was improperly performed, storaging food in inappropriate places, along with cleaning supplies, on the floor, in dark places and without ventilation. In Unit 1, the reception was held in open area, free from any kind of control during the reception (weight, packaging conditions, and temperature).

The current legislation recommends that both the reception and storage venues are cleaned and protected, ensuring protection against contaminants; also that raw material is stored on pallets, smooth and sturdy shelves, with spacing to ensure proper ventilation and cleaning, when necessary.[6]

According to Cardoso et al.,[21] in the food chain, procurement of good quality raw materials, with the provenance guaranteed by inspection bodies, is considered a requirement for the final product quality assurance and safety. It is also related to the health of commensals since undetermined origin food do not undergo sanitary inspection or registration in government offices, a procedure that aims to control the goods and to ensure that the food is suitable for consumption.

In Campos et al.[22] study in self-service restaurants in the city of Alfenas-MG, high rates of non-compliance related to food, as the local storage and inadequate temperature, were also found. Reolon and Silva[22] reported, in a study with six restaurants in Medianeira-PR, that in most establishments the storage of the raw material was improperly performed, with storage in inappropriate places, along with cleaning supplies, on the floor, in dark places and without ventilation.

Food preparation

Unlike Unit 1, Unit 2 presented non-compliance items (25%) when several flaws, such as inadequate temperature during the use of heat treatment, lack of the binomial time-temperature control during distribution of food, and lack of temperature control during the use of oils and fats were observed.

The same non-compliances were observed by São José and Pinheiro-Sant'Ana[9] in schools feeding units. The mere presence of visible thermometer on counters can be an important ally in the item "control the distribution temperature", because it also allows the observation by customers, inducing those responsible for preparing meals to direct more attention to this factor.[24]

Storage and transportation of food prepared

None of the evaluated units control time and temperature of the food during the waiting time for distribution. Unit 2 provided meal transportation, but did not control the temperature neither before shipping nor when the food reached other unit.

Monteiro et al.,[25] when evaluating food storage and distribution temperature in commercial restaurants located in a public educational institution in Belo Horizonte-MG, found that for cold preparations there were inadequacies in 100.0% (n = 11) of the evaluated restaurants, and for warm preparations, it was observed that only one restaurant presented adequate temperature values.

The binomial "time and temperature" is a paramount meals production quality control instrument, since warm and refrigerated preparations exposed to inappropriate temperatures for extended periods may favor the multiplication of micro-organisms.[25]

Food prepared exposure to consumption

In both units assessed, the distribution counters had no protection as well as the utensils used for consumption of food, and food were on the support stands. The equipment needed for distribution and display of prepared foods presented no temperature regularly monitored.

The main purpose of thermal counters for the distribution of food is to provide preparations in comfortable temperature, in addition to maintaining a safe condition from a microbiological point of view. For greater security the exposure time, it is necessary that the distribution equipment is under controlled temperature, in appropriate conservation and operating state.[26] The absence of this food temperature control compromises the quality of the offered preparations, making a predisposing factor for the diseases caused by pathogens foodborne.[27]

Documentation and registration

Unit 1 presented inadequacy regarding the *Best Practices and Standard Operating Procedures Manual*, and these documents were accessible and available for consultation to employees involved.

Unit 2 presented inadequacy regarding the training records of the best practices food manipulators training programs. The resolution recommends that the food services should establish best practices to ensure the hygienic and sanitary conditions of food prepared.[7] Vila et al.[28] assessed school feeding units and found that 100% were inadequate regarding the item "documentation and registration".

Responsibility

Unit 1 presented four nutritionists to monitor the entire production process of the meals and there were records that indicated the involvement of technicians responsible in conducting training of food manipulators. In Unit 2, the training received by the responsible for food handling activities was not properly registered.

According to RDC nº 216/2004, those responsible for food handling activities should attend training courses in which they are addressed at least the following subjects: food contaminants, food-borne illnesses, hygienic food handling and best practices.[7] The high adjustment recorded in units may be related to the presence of the nutritionist on site.

Vila et al.[28] corroborate this finding and mention that schools have a responsible nutritionist technician who periodically enabled the manipulators on issues related to food hygiene. As for popular restaurants in the state of Rio de Janeiro, Melo et al.,[29] despite the existence of manipulators trainings, observed that they were often insufficient to improve knowledge.

Conclusion

The units were classified in Unit 1 and Unit 2, indicating high percentage of adequacy to the assessed items. However, several inadequacies were found in the evaluated establishments, such as poor condition of the buildings, facilities, handling and organization of activities. Units 1 and 2 have similar inadequacies, requiring improvements in the structural conditions and hygiene, regarding the conditions of raw materials and in relation to the exposure conditions of the food prepared, the latter presented the worst percentage of adequacy in both units.

The presence of the responsible qualified technician is extremely important for the development and maintenance of best hygiene practices, but the dependence on the financial resources often prevents the adequate work, debilitating the procedures due to lack of equipment, sanitizers and quantitative employees, which are fundamentally important for the food preparation procedures.

This study allowed demonstrating that the application of a simple tool like the checklist, allows evaluating of sanitary conditions in units preparing meals, and, from observations, seeking strategies that to correct failures.

References

1. Organização Mundial de Saúde. Foodborne disease: a focus for health education. Geneva: World Health Organization; 2000.
2. Associação Brasileira de Refeições Coletivas. Mercado Real. São Paulo. [acesso em : 07 mar 2015]. Disponível em: [http://www.aberc.com.br/mercadoreal.asp?IDMenu=21].
3. Teixeira SMFG, Oliveira, ZMC, Rego JC, Biscontini TMB. Administração aplicada a unidades de alimentação e nutrição. São Paulo: Atheneu; 1990.
4. Ramos MLM, Scatena MF, Ramos MIL. Qualidade higiênico-sanitária de uma unidade de alimentação e nutrição institucional de Campo Grande,MS. Hig. Aliment., 2008; 22(164):25-31.
5. Cunha FMF, Magalhães MBH, Bonnas DS. Desafios da gestão da segurança dos alimentos em unidades de alimentação e nutrição no Brasil: uma revisão. Revista de Comportamento, Cultura e Sociedade, 2012; 1(2):4-14.
6. Bas M, Ersun AS, Kivanc G. The evaluation of food hygiene knowledge, attitudes, and practices of food handlers in food businesses in Turkey. Food Control. 2006; 17(4):317–22.
7. Brasil, Resolução RDC n° 216, de 15 de setembro de 2004. Dispõe sobre o regulamento técnico de boas práticas para serviço de alimentação. Diário oficial [da] República Federal do Brasil: Brasília, DF, 16 set. 2004.
8. Brasil. Resolução RDC nº 275, de 21 de outubro de 2002. Dispõe sobre o Regulamento Técnico de Procedimentos Operacionais Padronizados aplicados aos Estabelecimentos Produtores/ Industrializadores de Alimentos e a Lista de Verificação das Boas Práticas de Fabricação em Estabelecimentos Produtores/Industrializadores de Alimentos. D.O.U. - Diário Oficial da União; Poder Executivo, de 23 de outubro de 2003.
9. São José JFB, Pinheiro-Sant´Ana HM. Avaliação das boas práticas de manipulação em unidade de alimentação escolar. Nutrire: Rev Soc Bras Alim Nutr. 2008; 33(3):123-38.
10. Silva DO, Oliveira EA, Braga GA, Costa GF, Feijó TS, Cardozo SV. Reconhecimento dos riscos ambientais presentes em unidades de alimentação e nutrição no município de Duque de Caxias, RJ. Saúde & Amb.,2008; 3(2):1-6.

11. Fonseca MP, Manfridrini LA, São José JFB, Tomazini APB, Martini HSD, Ribeiro RCL, et al. Avaliação das condições físico-funcionais de restaurantes comerciais para Implementação das boas práticas. Alim. Nutr., 2010, 21(2):251-257.

12. Rossi CF. Condições higiênico-sanitárias de restaurantes comerciais do tipo self service de Belo Horizonte-MG. [Dissertação]. Belo Horizonte: Universidade Federal de Minas Gerais; 2006.

13. Gomes, NAAA; Campos, MRH; Monego, ET. Aspectos higiênico-sanitários no processo produtivo dos alimentos em escolas públicas do Estado de Goiás, Brasil. Rev. Nutr. 2012; 25 (1):473-485.

14. Silva Junior EA. Manual de controle higiênico-sanitário em serviços de alimentação. 7 ed. São Paulo: Varela; 2014.

15. Andrade NJ. Higiene na indústria de alimentos. São Paulo: Varela; 2008.

16. São José JFB, Coelho AIM, Ferreira KR. Avaliação das boas práticas em unidade de alimentação e nutrição no município de Contagem-MG. Alim. Nutr., 2011; 22(3):479-487.

17. Marchi DM, Baggio N, Teo CRPA, Busato MA. Ocorrência De Surtos de doenças transmitidas por alimentos no Município de Chapecó, Estado de Santa Catarina, Brasil, no período de 1995 a 2007. Epidemiol. Serv. Saúde, 2011; 20(3):401-407.

18. Bramorski A, Konkevitz D, Souza FO, Crescencio TM, Santos RC Programa de combate à fome do município de Joinville-SC: diagnóstico higiênico-sanitário de cozinhas comunitárias. Hig. Aliment., 2004;18(124):50-53.

19. Oliveira MN, Brasil ALD, Taddei JAAC. Avaliação das condições higiênico-sanitárias das cozinhas de creches públicas e filantrópicas. Ciência & Saúde Coletiva, 2008,13(3):1051-1060.

20. Reolon CA, Silva SM. Condições higiênico-sanitárias de restaurantes do município de Medianeira, PR. Hig. Aliment, 2009, 23 (174/175):52-56.

21. Cardoso RCV, Góes JAW, Almeida RCC, Guimarães AG, Barreto DL, Silva SA, et al. Programa nacional de alimentação escolar: há segurança na produção de alimentos em escolas de Salvador (Bahia). Rev Nutr. 2010; 23(5):801-11.

22. Campos MCB, Nicodemo TC, Weber ML. Boas práticas em restaurantes do tipo self – service: situação no município de Alfenas – MG. Hig Alim, 2013; 27(222/223):51-55.

23. Reolon CA, Silva SM. Condições higiênico-sanitárias de restaurantes do município de Medianeira, PR. Hig Alim, 2009; 23(174/175):52-56.

24. Momesso A.P. Levantamento das temperaturas de distribuição de alimentos, durante o período de serviço de bufê, em restaurantes self-service do município de São Paulo e pesquisa de agentes patogênicos e indicadores de higiene. [Dissertação] : São Paulo :Faculdade de Saúde Pública, Universidade de São Paulo; 2002.

25. Monteiro MAM, Ribeiro RC, Fernandes BDA, Sousa JFR, Santos LM. Controle das temperaturas de armazenamento e de distribuição de alimentos em restaurantes comerciais de uma instituição pública de ensino. Demetra; 2014; 9(1); 99-106.

26. Rodrigues FA, Nascimento DA, Cavichioli D, Souza AM. Identificação de pontos críticos de controle de preparações protéicas, em uma unidade de alimentação e nutrição. Hig Alim. 2010; 25 (1):192/193.

27. São José JFB. Contaminação microbiológica em serviços de alimentação. Nutrire: Rev Soc Bras Alim Nutr., 2012; 37(1):78-92.

28. Vila CVD, Silveira JT, Almeida LC. Condições higiênico-sanitárias de cozinhas de escolas públicas de Itaqui, Rio Grande do Sul, Brasil. Vig Sanit Debate 2014; 2(2): 67-74.

29. Melo AG, Gama MP, Marin VA, Colares LGT. Conhecimento dos manipuladores de alimentos sobre boas práticas nos restaurantes públicos populares do Estado do Rio de Janeiro. Braz J Food Technol. 2010:13(1):60-8.

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