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Guidelines for food safety health operations and production

Abstract

The aim of this study review article was to pay attention to the guidelines for food safety, health affairs operations and production in order to produce safe healthy food free of contaminants that cause bacterial and virus pathogenic poisoning and direct infection to humans. Producing a food product with special specifications for functional foods, staying away from foods that are likely to cause contamination and food poisoning, conducting chemical and microbial analyzes and food contaminants, as well as taking samples from every manufacturing step in the factory to identify critical control points to solve all problems related to the safety of the food product.

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Introduction

In general, the concept of health affairs is considered a way of life because it expresses the standard and degree of human living, and therefore it is linked to a clean home, a clean factory a clean industry, and a clean society. Since human health is a way of life it begins with individuals and is developed with science and health knowledge as a necessary and ideal matter in human relations in society and therefore Everyone who works in the field of food hygiene including heads supervisors and workers must know that healthy food is a way of life through understanding and knowledge and thus making a positive decision to achieve sound health. When talking about the importance of the field of healthy food, it is necessary to pay attention first to the specialist in health affairs. This food sanitarian is responsible for the application provision and guarantee of the continuity of healthy food. It is an applied microbiology specialist at a high level, and this means that it links basic biological information, especially those related to microorganisms With the science of food this requires the need for a food health specialist to know everything related to the food factory its manufacturing processes and critical control points within production lines and everything related to the field of various food services provided to the consumer.[1,2]

The main branches of the field of health food

First healthy food factory

Where the design and construction of the food factory greatly affects the health specifications of the food manufactured in it the factory must be designed and installed so as to achieve health protection for the industrial processes and products that are manufactured and located inside, and the following requirements must be met when establishing food factories.

I. Providing sufficient spaces for the installation of various machines and devices
II. Providing sufficient space for storing raw and processed foodstuffs
III. Providing separation between industrial processes that lead to food contamination during the preparation and manufacturing stages
IV. Providing adequate lighting from its various sources and types
V. Providing adequate ventilation from its various sources
VI. Providing protection against various insects.[3]

Second, healthy food manufacturing processes

All the processes and steps related to the handling and manufacturing of various foodstuffs, and thus comprise the following points:

I. Sanitary machinery and equipment manufacturing equipment
II. Healthy raw materials used in the manufacture of food
III. Healthy water
IV. Healthy air
V. Control of insects, rodents, birds and the environment surrounding food
VI. Healthy food products
VII. Hygienic food storage
VIII. Healthy food handling and transportation
IX. Healthy manufacturing workers.[4]

Third, healthy food service industry

I. The food service industry includes the following sections:
II. Fast food food service
III. Restaurants of all kinds
IV. Food service in hospitals
V. Hotel food service
VI. Serving food in airlines
VII. Food service in commercial marketing centers
VIII. Mass food service, including
IX. School feeding service
X. Feeding elderly care homes and pensioners

XI. Labor gatherings feeding service

XII. Armed Forces Feeding Service - Spacecraft Feeding Service.[4]

Steps involved in a healthy food service industry

I. Purchasing

II. Receiving

III. Storage

IV. Preparation

V. Manufacturing

Presenting to the consumer In order to achieve food hygiene in the previous three branches, it is a responsibility in which all sections of the food factory and food facility are left, and on the face of allocation, the following sections:

I. Senior management

II. Quality control

III. Research and development

IV. Engineering

V. Production

VI. Selling

VII. Distribution[5]

The importance of training

Workers in the various fields of food and its relationship to food health must be trained, and workers in the field of food manufacturing and in the field of handling and serving meals should be trained on the theoretical and applied foundations of food hygiene.The training programs aim to prepare and train all food workers in order to help achieve healthy food, while what is related to food hygiene in food establishments of all kinds is a food health specialist and must be available in it.[6,7]

Conditions that must be met by a food hygienist:

I. He should be familiar with the theoretical and practical foundations of the following sciences:- food science – Microbiology - public health science-chemistry- world of insects – biology -Engineering Science

II. He should be distinguished by the common sense that helps him to express the right opinion

III. To be distinguished by diplomacy, tact, speaking and good measure.[7]

It is required to determine the practical application of the following food health:

I. Design and construction of a fully equipped factory that suits the required food manufacturing and conforms to standard health specifications and always achieves complete cleanliness in the factory.

II. Availability of sufficient machinery, equipment and devices that are suitable for the food industries

III. Providing the necessary equipment for washing and cleaning machinery and manufacturing equipment

IV. Purchasing raw foodstuffs and other elements of manufacturing and production from sound food sources

V. Conducting hygienic storage of foodstuffs and various production elements

The worker who works in the field of handling, manufacturing and serving the following food is required:

I. To be in good health

II. To have good personal health behavior

III. To have good work habits

IV. To be willing to receive educational training courses in the field of food hygiene.[8]

Precautions to be taken when preparing and preparing food

Personal health

Kitchen health To reduce this, the following must be followed Preventing bacteria from entering the food by knowing the sources of pollution in the kitchen Food must also be cooked and stored in a healthy way to reduce the spread of bacteria and food poisoning - Washing hands with hot water and soap to avoid contamination during the preparation and preparation of food that follows food poisoning as a result of the negligence of the cooks to wash their hands use paper towels and dispose of them in the garbage directly and dry hands with hot water, and cloth towels (towels) are excluded because they are unhygienic bacteria entering the bathroom hands should be washed immediately afterwards to prevent the spread of bacteria from the man's excrement to the hands nasal mucus that carries staphylococcus bacteria, which is transmitted to the hands when using tissues, so tissues must be used and disposed of eating raw meat chicken and vegetables the reason is the transmission of bacteria from raw meat to cooked dishes causing food poisoning, especially salmonella and clostridium bacteria cracking eggs Salmonella is often found on the egg shell Avoid eating leftovers or food scraps as they contain a large number of all types of bacteria.[9]

There are cases when food should not be eaten

I. Smoking in the kitchen Smoking is prohibited by law just as bacteria are transmitted from the mouth and lips to the hands as well as ashes from cigarettes that are loaded with bacteria may fall into food

II. Sneezing or coughing over food moisture and droplets coming out during coughing and sneezing carry large numbers of staphylococcus bacteria to food or the surface of the table on which food is prepared

III. Hair styling in the kitchen, where staphylococcus bacteria grow on the scalp and move to the hands, and brushing the hair will make dandruff fall into the food so the hair should be washed regularly and covered with a net or cover as long as the work is in the kitchen.[10]

IV. Dipping fingers inside food to lick it as licking or licking the spoon and returning it to the food without washing the bacteria will move from the mouth to the hands or the spoon to the food wearing ornaments and jewelry where above the skin and under the jewelry there are bacteria that cause food contamination.[11]

V. Wounds or ulcers are a source of infection with staphylococcus

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bacteria so they must be covered with a sheet and gauze

VI. Wearing clean apron, towels and head coverings as the exposed clothes will give the opportunity for bacteria to be present in the exposed parts of the bodywhile closed clothes will not allow bacteria to enter the body

VII. Using clean and healthy tools to prepare food, such as knive, forks and plates, and getting rid of cracked, wounded and damaged tools because they cause food poisoning

VIII. Covering the visible and exposed food in order not to attack the flies and mosquitoes that are attracted to the open food as well as the bacteria present in the dirt and dust that will fall on the food and contaminate it.

IX. Keep pets out of the kitchen, as these animals carry bacteria in their feet and fur and spread easily in food.

X. Keeping animal food away from human food as well as using special tools that separate animal food from human food.[12]

The washing process plays an important role in hygiene and prevention of food poisoning when preparing and preparing food

I. The washing-up process plays an important role in hygiene and prevention of contamination and food poisoning washing-up The aim of Remove visible food waste.

II. Destroying the bacteria found on tools utensils and equipment contaminated with flasks and dirt.

III. Using the washing process immediately after the use of tools, utensils and equipment in preparing food, in order to eliminate the fuels and pollutants.

IV. Failure to follow the proper sanitary conditions in hygiene by washing the tools and equipment used in preparing food leads to the outbreak and emergence of disease and cases of food poisoning.

V. The importance of the washing process is to use hot water and chemicals such as detergents and disinfectants in order to get rid of dirt and grease and to eliminate bacteria and germs.[13]

Materials used in the washing process

These materials perform the various functions necessary for the cleaning and disinfection process

Hot water is used in the disinfection process

I. Chemicals from the following

II. Detergents such as soap. One of these messages is in washing and espionage operations, which are used in washing, regeneration and foaming processes with water and hardness.

III. Disinfectants are chemical substances that have the ability to work on most bacteria and germs found on collective work surfaces and utensils.

IV. Hypochlorite's are chemicals that are often used as disinfectants for utensils and tools in the preparation and preparation of food, taking into account the use of appropriate concentrations so as not to leave an impact on the taste and smell.

V. Chemicals and dispersal of disinfectants and detergents in food processing and preparation processes at the same time.

VI. Deodorants are chemicals that remove unwanted odors such as fresh air sprays and these deodorants do not kill bacteria.[14]

How detergents work

First stage. We find that water does not spread on the surface of pots contaminated with greasy grease, and the water turns into small droplets.

Stage 2. Where we find that the water spreads on surfaces contaminated with grease after adding detergents and therefore the detergent molecules work to link the water molecules and the fat molecules together.[15]

Stage 3. When adding the detergent to the water, we find that the detergent molecules wrap around and surround the water droplets, as we find that the detergent is composed of two parts, one of them is water loving which is the ability of the molecule to bind with water.

Stage 4. We find that the detergent binds to the toxins after converting them into small globules of fat surrounded by detergent molecules and they are suspended in the water. These toxins are removed when the washing water stream passes into the waste water.[16]

The different stages of the washing process

Attention should be paid to the systems of the washing process and to be carried out far from the places where food is prepared in order not to contaminate the utensils and dishes with food residues. Washing is also done by hands or with an automatic laundry.[17]

Generally the washing process is carried out in stages

Preparation stage

Where utensils and dishes are cleaned of stuck food residues and rinsed with warm water

Main wash stage

Detergents are added to the water in order to help remove food residues and grease, provided that the temperature is between 50-60 °C which helps to get rid of food traces stuck in the utensils as well as on the hands and flasks used in the washing process taking into account that the temperature exceeds 63 °C because this This leads to the fixation of protein residues on utensils and knives. When removing food residues with cloth by wiping with cleaner and hot water then the cloth used for wiping is disposed of. If used more than once it must be washed well and dried after use daily because this piece does not become free of microbes.[17]

Rinsing stage

In the first and second stages washing with water and detergent. As for the rinsing stage, the water used is at a temperature of 80 0 C where utensils and tools are immersed for 2 minutes.

The purpose of this stage

I. Get rid of any traces of detergents on the pots and dishes by rinsing, because the effects of these detergents affect the comfort of the food placed on the plates and the occurrence of damage if food is eaten.

II. The process of rinsing at 80 ° C kills the remaining bacteria.

III. Hot water in rinsing leads to raising the temperature of tools and utensils, and thus leads to quick drying when exposed to atmospheric air and becomes dry.

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Drying stage

I. Racks and shelves for filtering rinse water, utensils and tools are allocated for the purpose of drying them completely and the temperature must be maintained at 80 0 C, as this helps to speed up drying when placed in shelves and racks.

II. When using tea towels wash the towels every time and periodically, because when drying with towels, moisture leads to contamination of the towels and is an environment suitable for the growth and reproduction of bacteria.

III. The utensils and tools after drying should be stored under covers so as not to cause external contamination.[18]

Conditions to be taken into account when designing kitchens and food preparation places

The most important factors to consider when designing kitchens are:

I. Easy to clean walls and floors

II. Ease of cleaning equipment and utensils

III. Ease of cleaning large equipment such as ovens and refrigerators that accumulate dust.[19]

There are some examples below

I. Storing vegetables, especially those loaded with mud and dust, such as potatoes, away from the kitchen until this dust is removed so as not to contaminate the kitchen with it.

II. Preparation and processing of meat is separate from the rest of the kitchen

III. Washing hands and devices is done away from food preparation and storage places

IV. The lighting shows the presence of any stains and dirt in the walls and floors and natural sunlight is considered the best type of lighting

V. Good ventilation is one of the conditions of a healthy kitchen, because the air constantly gets rid of the smells of food and cooking, as well as preventing the presence of moisture for the growth of microorganisms.[20]

VI. Food processing tools the tools and equipment used in food processing must be of a solid stainless easy to clean material that does not have special cracks on the surfaces.

VII. Dispose of garbage and food waste as it is a suitable environment for bacteria growth

VIII. Hand washing basins should be made of stainless steel. These basins should be equipped with hot and cold water, soap and towels. Several basins are used, a basin for washing hands a basin for washing food and a basin for washing machinery and equipment.

IX. Floors walls and ceilings are made of a white material that does not absorb moisture and has no cracks and protrusions that prevent cleaning.[21]

What is cross- contamination

It is an unintended accidental contamination of clean, healthy food by disease-causing bacteria through contaminated hands - manufacturing surfaces - machinery and equipment - workers' clothes - raw food

Causes of the phenomenon of accidental pollution

First, the contamination with tools and equipment. Using kitchen equipment or cutting motors for two different types of food without completely washing between them. For example using mincers when mincing raw meat and while the cook is busy preparing those meats, where he leaves the mincer without cleaning and then another cook comes and uses it to chop another type of meat Bacteria are transferred from the first type to the second type. Using knives and bowls without washing them completely between uses, and repeating them for cutting several times makes them vulnerable to contamination.[22] To reduce this contamination, all kitchen equipment is washed and disinfected immediately such as mincers to prevent bacterial contamination, as well as washing knives with disinfectants and hot water immediately after use cutting raw meat and before using it in cooked meat.

Secondly, contamination during food handling. Contamination occurs during food circulation through the hands circulating in food that did not wash between the preparation operations of the different types of food or contamination through the nose, mouth, hair and contaminated cooking equipment or the cook who handles food and has a cold who continues to work without rest, which leads to the transmission of bacteria from the cook during Sneezing and not washing and disinfecting the hands, which leads to the transmission of bacteria to the food that is prepared and prepared.[23]

Thirdly, contamination during the preservation of food prepared in the wrong way. Placing food in the refrigerator in the wrong and incorrect way, such as placing raw meat on the upper shelf of the refrigerator over cooked food, such as grilled chicken prepared for consumption and not covered in the lower shelf of the refrigerator and consequently, the occurrence of separated liquids and blood over the cooked food, so bacteria are transmitted. To prevent this contamination use a refrigerator for raw meat and the other for cooked meat.[24]

Fourthly, animals and insects. Like flies, mice and birds, they are often carriers of pathogenic bacteria and then move to food and tools and contaminate them

Fifth, dust or dirt Dust. Dust contains spores of pathogenic bacteria so raw vegetables should always be clean.[25]

Foods likely to cause food poisoning

I. Fish Fishing from polluted water places causes pollution, just as eating fish causes pollution due to the presence of cyclic hydrocarbons which causes carcinogenic diseases.

II. Dairy products Pasteurized milk is free from pathogenic microbes but if it is left after pasteurization for a period in the normal atmosphere it becomes contaminated and becomes an ideal food for the growth of bacteria.

III. Cream is an ideal food for bacteria growth if it becomes contaminated after pasteurization

IV. Condensed milk is safe when opening the box for the first time but if used again, it will be contaminated

V. Chilled meat causes food contamination after cooking, in order to keep it warm for several hours before using it.[26]

VI. Meat and cooked food do not cause food poisoning but if kept warm for several hours or slowly cooled, it causes contamination

VII. Minced meat is subject to contamination with bacteria on the surface, which is distributed through the mass of meat in addition to contamination in the mincer

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VIII. Processed meat, it is necessary to take care that the temperature inside as well as outside is not contaminated

IX. The broth does not cause poisoning in the case of boiling and heating, but when kept warm, it causes food poisoning.

X. 10- Gelatin powder, as it always contains food poisoning bacteria, and when it is dissolved in water for use in meat pies and coatings it becomes an ideal food for the growth of bacteria so it must be preserved at a temperature of 63 °C.[27]

There are other instructions and precautions to prevent pathogenic bacteria from reaching food

I. Not following the instructions during the manufacturing process

II. Follow health rules and principles in manufacturing processes

III. Improper manufacturing methods such as canning operations that do not conform to health foundations

IV. Sewage as a source of contamination of fish, vegetables and fruits

V. Obtaining food from contaminated and infected sources

VI. Contamination by pets and animals

VII. Using tools and devices contaminated wit.[28]

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Conflicts of interest

The author declares there is no conflict of interest.

References

1. *International Food Safety Standard, Standard for auditing, retailer and wholesaler branded food products. Ed. HDE Trade Services, Berlin, Germany*. 2007:117
2. WHO. *Five keys to growing safer fruit and vegetables*. 2012.
3. Scientific Opinion on the risk posed by pathogens in food of non-animal origin. *Part 1: outbreak data analysis and risk ranking of food/pathogen combinations*. 2013;11(1):3025.
4. Scientific Opinion on the risk posed by pathogens in food of non-animal origin. *Part 2 Salmonella and Norovirus in leafy greens eaten raw assalads.* 2014;12(3):3600.
5. Engler A, Nahuelhual L, Cofre G, et al. How far from harmoniza-tion are sanitary, phytosanitary and quality-related standards? An exporter's per-ception approach. *Food Policy*. 2012;37(2):162–170.
6. *FAO and CAC*. 2013.
7. Fisher IS, Brien SO. Salmonella newport infection in England associated with the consumption of ready to eat salad. *Europe's journal on infectious disease surveillance, epidemiology, prevention and control.* 2001;5(26).
8. Henson S, Masakure O, Boselie D. Private food safety and quality standards for fresh produce exporters: The case of Hortico Agrisystems, Zimba-bwe. *Food Policy*. 2005;30(4) :371–384.
9. Holvoet K, De Keuckelaere A, Sampers I, et al. Quantitative study of cross-contamination with E. coli, E. coli O157:H7, MS2 phage and murine norovirus in a simulated fresh-cut lettuce wash process. *Food Control*. 2014;37:218–227.
10. Winkler A, Freund M. The potential for third party standards at manu--facturing and retail to reduce the risk of listeriosis arising from consumption of Listeria monocytogenes from ready-to-eat foods. *Food Control*. 2011;22:1503–1505.
11. Humphrey J. *Private standards in Kenyan horticulture: did the donors respond effectively to the challenge? paper prepared for ILRI/AGRA workshop. Towards Priority Actions for Market Development for African Farmers.Nairobi.* 2009. p. 13–15.
12. Broberg M. *European Food Safety Regulation and the Developing Countries*. Regulatory problems and possibilities. DIIS Working Paper. 2009. p. 09.
13. Jay MT, Cooley M, Carychao D, et al. Escherichia coli O157:H7 in feral swine near spinach fields and cattle, central California coast. *Emerging Infectious Dis-eases Journal.* 2007;13(12):1908–1911.
14. Jordaan D, Kirsten J. *Deliverable 1.5 Veg-i-trade project: Establishment of the impact of existing and improved relationships between various supply chain actors on chain efficiency*. 2014.
15. Kirezieva K, Jacxsens L, Uyttendaele M, et al. Assessment of food safety management systems in the global fresh produce chain. *Food Research International*. 2013;52:230–242.
16. Kirezieva K, Nanyunja J, Jacxsens L, et al. Context factors affecting design and operation of food safety management systems in the fresh produce chain. *Trends in Food Science& Technology*. 2013;32:108–127.
17. Kirezieva K, Jacxsens L, Hagelaar G, et al. Exploring the influence of context on food safety management:*Case studies of leafy greens production in Europe, submitted for publication to Food Policy*. 2015;51:158–170.
18. Liu C, Hofstra N, Franz E. Impacts of climate change on the microbial safety of pre-harvest leafy green vegetables as indicated by Escherichia coli O157 and Salmonella spp. *International Journal of Food Microbiology*. 2013;163:119–128.
19. Luning P, Marcelis W. A conceptual model of food quality manage-ment functions based on a techno-managerial approach.*Trends in Food Science and Technology*. 2007;18(3):159–166.
20. Luning PA, Marcelis WJ, Rovira J, et al. Systematic assessment of core assurance activities in a company specific food safety management system. *Trends in Food Science and Technology*. 2009;20:300–312.
21. Luning PA, Bango L, Kussaga J, et al. Comprehen-sive analysis and differentiated assessment of food safety control systems:a diag-nostic instrument. *Trends in Food Science and Technology.* 2008;19(10):522–534.
22. MacDonald E, Heier BT, Stalheim T, et al. Yersinia enterocolitica O:9 infections associated with bagged salad mix in Norway, February to April. *Eurosurveil-lance*. 2011;16(19).
23. Minten B, Randrianarison L, Swinnen JF. Global retail chains and poor farmers: Evidence from Madagascar. *World Development*. 2009;37(11):1728–1741.
24. Nanyunja J, Jacxsens L, Van Boxstael. *Constraints at micro-, meso- and macro-level of the Ugandan hot pepper supply chain and their impact on assurance of food safety; submitted for publica-tion in Journal of World Development*. 2014.
25. Van Haute S, Sampers I, Holvoet K, et al. Physicochemical quality and chemical safety of chlorine as a reconditioning agent and wash water disinfectant for fresh-cut lettuce washing. *Applied and Environmental Microbiology*. 2013;79(9):2850 –2861.
26. Van Haute S, Sampers I, Uyttendaele M. Organic acid based sanitizers and free chlorine to improve the microbial quality and shelf-life of sugar snaps. *International Journal of Food Microbiology.* 2013;167:161–169.
27. Van Haute S, Sampers I, Jacxsens L, et al. Selection criteria for water disinfection techniques in agricultural practices. *Critical Reviews in Food Science and Nutrition*. 2015;55(11):1529–1551.
28. Vogel D. *The Private Regulation of Global Corporate Conduct*. 2007.

29. Vandekinderen I, Devlieghere F, De Meulenaer B, et al. Optimization and evaluation of a decontamination step with peroxyacetic acid for fresh-cut produce. *Food Microbiology.* 2009;26(8):882–888.

30. Kirezieva K, Jacxsens L, van Boekel, et al. Towards strategies to adapt to pressures on safety of fresh produce due to climate change. *Food Research International*. 2015;68:94–107.

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