

Detection of Hazards in food and methods of prevention

Fahim A. Shaltout

Food Control, Faculty of Veterinary Medicine, Benha University, Egypt.

*Correspondence Author: Fahim A. Food Control, Faculty of Veterinary Medicine, Benha University, Egypt.

Received Date: September 06, 2024 | Accepted Date: September 20, 2024 | Published Date: October 04, 2024

Citation: Fahim A. Shaltout, (2024), Detection of Hazards in food and methods of prevention, *Clinical Trials and Case Studies*, 3(5); DOI:10.31579/2835-835X/081

Copyright: © 2024, Fahim A. Shaltout. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Abstract:

A food contaminant refers to any substance that is present in the human food and can potentially cause harm to the consumers. The contaminated food may be biological, chemical, or physical in nature. They can be naturally occurring in the food material or introduced during the food production, handling, or storage. Every human food business is mandated to establish controls and monitoring procedures against the human food contaminants. A food object is referred to as contaminated if it comes in contact with an unwanted substance and could result in severe illness or injury if it is consumed. The Contamination can occur through various means, including biological, chemical, or physical sources, and it is a significant concern for the food safety and quality assurance in the industry.

Keywords: food contaminants; hazards; biological; chemical; physical

Introduction

The contaminated food is a severe public health issue in the world, leading to the human foodborne illness that affect humans annually. The Contamination describes a situation of the presence of unwanted elements that is not appropriate for use. The contaminated food usually happens when foreign particles such as the microorganisms, the chemicals, and the insects are present. Several incidents related to the contaminated food, the human food mislabeling, and the human food safety have been recorded, which has attracted more attentions [1-7]. The development of reliable and efficient techniques of detection was challenging due to the complexity of the human food matrices and trace levels of contaminants in the human food. The biosensor is an alternative with the excellent selectivity, the specificity, the sensitivity, the usability, the flexibility, the low cost, and the quick processing time. The toxicological elements, and the biosensor technology risk analysis [8-14]. The Different applications of the biosensor technology for the identification of the chemical food contaminants, including the pesticides, the heavy metals, the migratory substances from the packaging materials, the pollutants, and the unapproved and the dangerous food additives in the human food [15-21]. types of the contaminated food The three types of the contaminated foods are the following: The Biological food contamination, The Chemical food contamination.

The Physical food contamination

These types are the major categories of the contaminated food and do not include others, such as allergenic food contamination and radiological food contamination. It depends up on the type of raw materials and products being produced, the most common human food hazards in a business may vary [22-28].

The Biological food contamination One of the most common types of food contamination, biological food contamination, refers to the presence of harmful microorganisms such as bacteria, molds, yeasts, viruses, and parasites. These harmful agents are collectively known as the human food

pathogens. It Depend up on the biological hazards in the human food, their effects can range from mild problems such as the nausea to the lifethreatening foodborne illnesses. Some of the most common biological food contaminants in the human food industry include the Norovirus, the Salmonella, the Nontyphoidal Salmonella, the Escherichia coli (E.coli) , the Shigella, the Hepatitis A [29-36]. These pathogens are the top six microorganisms that cause foodborne illnesses in the US. Other pathogens such as the Clostridium botulinum, the Staphylococcus aureus, and the Listeria are also top contenders in this category. the biological food contaminants or otherwise termed the microbiological contaminants. Every year, the effect of these pathogens' accounts for at least 20% of the foodborne illnesses in the US. The Effects and examples of the biological food contamination [37-42]. The Biological contaminations can produce distinct changes in food items after a while. In favorable conditions, such as in the temperature danger zone, The biological food contaminants can produce the following changes to the human food, Produce acid and lower the pH of the product, Produce a bad smell, Change the color of the human food, Soften the texture of the food. These changes indicate the human food spoilage and that the human food products are not safe for consumption anymore. The effects of biological food contamination can be severe; they can always be prevented and controlled. The Proper human food safety practices and constant monitoring are key to controlling biological contaminants. With an effective human food safety management system, the sources of these food contaminants can be controlled and rooted out. Some biological food contaminants are naturally part of fresh produce, especially those that are grown from the soil and are exposed to environmental contaminations, such as root crops. Perishable foods, such as the unpasteurized milk, the milk products, the raw sprouts, the leafy greens, the raw fish, and raw meat, are very nutritious, and they make a good growing medium for infectious

organisms. The effects of biological food contamination can cause health risks when not handled properly. In addition, drinking water contaminants can be a very dangerous source of these biological contaminants [31,32,33,34,35 and 36]. The food Contaminants can enter the food production system during the human food preparation process through contaminated water when raw materials are washed. This fact tells you that any human food ingredient must be properly prepared and cooked to prevent illnesses causing microorganisms from causing any damage or harm to consumers. The Washing of Hands with blue latex gloves disinfecting tomatoes to decontaminate the fruit from the coronavirus. By Washing the fruit with water and lye to remove viruses [37-42].

The Chemical food contamination the Chemical food contamination refers to the presence of the unwanted chemicals in the human foods that can compromise their safety. The most common chemical contaminant examples in the human food establishments include the Cleaning solutions, the Fertilizer residues, the Pesticides, the Industrial oils, the Additives, the Production by products. The mentioned chemical food contaminants can enter a food business at any point and contaminate the foods. The Chemical food contaminants carry a great threat to the health of the consumers [43-48]. Their effects can vary depending on the sources and the concentrations. The Chemical food contaminations can be divided into different categories based on their origin, the Industrial, the Agricultural, the Toxic heavy metal, the Natural While the chemical food contaminations occur less often than the biological food contamination, their potential to cause the damage is significant. The Effects and the examples of the chemical food contamination, Some the chemical food contamination, such as the cleaning agents, can cause the burning, the swelling, the gastric problems, and sometimes even the longterm effects [49-54]. The Chemical substances may be introduced to the human food being made through improper use and the food handling. Some examples of the chemical food contamination in a food establishment, the Cleaning products, when not properly removed, can stay on the kitchen surfaces and then become transferred to the human food. The kitchen tools coated with the nonfood grade materials have been reported to have the contaminated foods with the toxic metals. The Agricultural products such as the fertilizer residues and the pesticides can stay on the raw produce [55-60]. The Substances such as the additives can be considered contaminants when added in excess or found in the products that shouldn't be in. The preparation of the food also plays a great role when it comes to the chemical food contamination. The improper washing of the fresh produce can leave traces of the fertilizers or the pesticides that can find their way into the other human food products. The effects of these unwashed food contaminants can worsen when exposed to the heat and served to the customers. The food byproducts such as the acrylamide can be used as an indication of the temperature abuse. This substance is a harmful chemical that is considered a carcinogen. The Controlling the chemical food contamination. The Sanitizer Concentration Log and The Cleaning and the Sanitation Checklist help to minimize and control cases of the chemical food contamination in the commercial human food facilities [61-65].

The Physical food contamination the Physical food contamination is the presence of the unwanted foreign materials in the food. These foreign materials can cause the injuries, the bleeding, the choking, and the broken teeth when ingested. The food physical hazards can block the air passage and prevent the normal breathing [66-71]. The Physical food contaminants can be categorized as the natural or the unnatural depending on the nature of the food contaminant. The physical food contamination include the presence of the Natural physical food contaminants, the Bone fragments, the Feathers or hair , the Pit, stem, and the skin of the raw fruits , the Pest droppings , the Unnatural physical food contaminants , the Glass, the Plastic, the Soil or sand, the Metal shards , the Personal effects (e.g., jewelry). the Natural physical food contaminants are naturally part

of the food materials, such as the fruit stems, whereas the unnatural ones include the stones, the glass, and the metal fragments. The Physical food contaminants, depending on their size, can be detected through the visual detection [72-77]. The Effects and examples of the physical food contamination When undetected, the physical food contaminations can cause serious injuries to the consumers. Some may cause the injury, whereas others can create the cuts to the throat or the mouth. The Physical contaminants can come from the food handlers and become transferred, such as the fingernails or the hair in the human food. In addition to causing the injuries, these food contaminants can become precursors to other types of the food contamination, such as the biological food contamination [78-83]. The Fingernails can introduce the harmful organisms to the food. Such is also the case when it comes to the physical food contamination from the pests. The Foodborne pathogens and illnesses can result if these contaminants are introduced into the human food. This effect highlights the importance of the pest management outside of the production area. Cases of the physical food contamination can result in a widespread food recall in the human food manufacturers. The presence of the physical food contaminants has topped the charts of the food recalls. These food contaminants were recorded composed of the hard and the soft plastics, the metal, the rubber, and the glass, which may originate from the packaging materials and the unmaintained equipment. The concept of the human fast food and the ecology. A man in a cap and a beard, holding a hamburger, and with disgust pulls out a thread [84-88].

The effective way to control the different types of the contaminated food While these food contaminants can easily go into the food being prepared, the food handlers can prevent them with an effective human food safety management system. The Proper preventive and control measures can be put in place to ensure that these food contaminations are well monitored. We can implement a digital The Food Safety Management System (FSMS). At Food Docs, we offer an intuitive solution to control the risk of the human food poisoning. Using our smart Food Monitoring System, you can be sure that the human food safety practices are done effectively and on time [89-94]. The Common sources of the contaminated foods can be addressed even before they can create any damage. With our monitoring tasks set at autofill, our kitchen staff can save time and promote the accuracy of recordings. Our Food Safety System features detailed instructions on how to perform the food safety tasks. We can ensure that every employee will perform the tasks exactly as instructed, ensuring the human food safety daily. We can upload our versions of the instructional materials to make training more personal for our business [95-100].

The Monitoring tasks with detailed instructions. The main cause of the contaminated food. The main cause of contaminated food is the biological agents including the pathogenic bacteria, the viruses, the molds, the yeasts, and the parasites. Of the 250 identified foodborne illnesses by the Centers for Disease Control and Prevention (CDC), the majority are attributed to different types of the bacteria, the viruses, and the parasites. The human Foodborne illnesses resulting from the biological food contaminants cause symptoms such as the vomiting, the diarrhea, and the abdominal pain. When left untreated, they can become lifethreatening [101-106].

One factor why the biological food contaminants are considered the main cause of the contaminated food is their ability to transfer from one place to another. The Bacteria and other types of the pathogens can easily be spread through the cross food contamination. Due to the pathogens are too tiny to be seen, the food handlers who do not practice the safe food handling can spread them from one point to another. By simply holding the raw foods and then a piece of the equipment or a clean utensil, the naturally present pathogens can spread [107-112]. We can learn more about how quickly the bacterial food contamination can occur from one

of our articles. The five most common ways for the human food to become contaminated in a human food establishment are the Cross food contamination, the Low quality food materials, the Improper food storage conditions, the Unclean food preparation conditions and the Poor personal hygiene [113-119].

Conclusion:

This is why one of the best ways to prevent the microbial food contamination is to regularly and correctly wash the hands. The worst carrier of contamination in human food service is a food handler who does not regularly wash his or her hands. The Microorganisms can be controlled through the proper human food handling practices. Their number can be easily controlled with the operations such as cooking properly, the cleaning and the sanitizing, and the storing human foods in the right conditions.

ORCID

<https://orcid.org/0000-0002-8969-2677>

Conflicts of Interest

The authors declare no conflicts of interest.

References:

- Shaltout, F.A., Riad, E.M., and AbouElhassan, Asmaa, A (2017): prevalence Of Mycobacterium Tuberculosis In Imported cattle Offals And Its lymph Nodes. *Veterinary Medical Journal -Giza (VMJG)*, 63(2): 115 – 122.
- Shaltout, F.A., Riad, E.M., and Asmaa Abou-Elhassan (2017): Prevalence Of Mycobacterium Spp. In Cattle Meat And Offal's Slaughtered In And Out Abattoir. *Egyptian Veterinary medical Association*, 77(2): 407 – 420.
- Abd Elaziz, O., Fatin S. Hassanin, Fahim A. Shaltout and Othman A. Mohamed (2021): Prevalence of Some Foodborne Parasitic Affection in Slaughtered Animals in Local Egyptian Abattoir. *Journal of Nutrition Food Science and Technology* 2(3): 1-5.
- Abd Elaziz, O., Fatin, S Hassanin, Fahim, A Shaltout, Othman, A Mohamed (2021): Prevalence of some zoonotic parasitic affections in sheep carcasses in a local abattoir in Cairo, Egypt. *Advances in Nutrition & Food Science* 6(2): 6(2): 25-31.
- Al Shorman, A.A.M., Shaltout, F.A. and Hilat, N (1999): Detection of certain hormone residues in meat marketed in Jordan. Jordan University of Science and Technology, 1st International Conference on Sheep and goat Diseases and Productivity, 23-25 October, 1999.
- Ebeed Saleh, Fahim Shaltout, Essam Abd Elaal (2021): Effect of some organic acids on microbial quality of dressed cattle carcasses in Damietta abattoirs, Egypt. *Damanhour Journal of Veterinary Sciences* 5(2): 17-20.
- Edris A, Hassanin, F. S; Shaltout, F.A., Azza H Elbaba and Nairoz M Adel (2017): Microbiological Evaluation of Some Heat Treated Fish Products in Egyptian Markets. *EC Nutrition* 12.3 (2017): 124-132.
- Edris, A., Hassan, M.A., Shaltout, F.A. and Elhosseiny, S (2013): Chemical evaluation of cattle and camel meat. *BENHA VETERINARY MEDICAL JOURNAL*, 24(2): 191-197.
- Edris, A.M., Hassan, M.A., Shaltout, F.A. and Elhosseiny, S (2012): Detection of E.coli and Salmonella organisms in cattle and camel meat. *BENHA VETERINARY MEDICAL JOURNAL*, 24(2): 198-204.
- Edris A.M.; Hemmat M. I., Shaltout F.A.; Elshater M.A., Eman F.M.I. (2012): STUDY ON INCIPIENT SPOILAGE OF CHILLED CHICKEN CUTS-UP. *BENHA VETERINARY MEDICAL JOURNAL*, VOL. 23, NO. 1, JUNE 2012: 81-86.
- Edris A.M.; Hemmat M.I.; Shaltout F.A.; Elshater M.A., Eman, F.M.I. (2012): CHEMICAL ANALYSIS OF CHICKEN MEAT WITH RELATION TO ITS QUALITY. *BENHA VETERINARY MEDICAL JOURNAL*, 23(1): 87-92.
- Edris, A.M.; Shaltout, F.A. and Abd Allah, A.M. (2005): Incidence of Bacillus cereus in some meat products and the effect of cooking on its survival. *Zag. Vet. J.* 33 (2): 118-124.
- Edris, A.M.; Shaltout, F.A. and Arab, W.S. (2005): Bacterial Evaluation of Quail Meat. *Benha Vet. Med. J.* 16 (1): 1-14.
- Edris, A.M.; Shaltout, F.A.; Salem, G.H. and El-Toukhy, E.I. (2011): Incidence and isolation of Salmonellae from some meat products. Benha University, Faculty of Veterinary Medicine, Fourth Scientific Conference 25-27th May 2011 Veterinary Medicine and Food Safety) 172-179 *benha*, Egypt.
- Edris AA, Hassanin, F. S; Shaltout, F.A., Azza H Elbaba and Nairoz M Adel (2017): Microbiological Evaluation of Some Heat Treated Fish Products in Egyptian Markets. *EC Nutrition* 12.3 (2017): 134-142.
- Edris, A.M.; Shaltout, F.A.; Salem, G.H. and El-Toukhy, E.I. (2011): Plasmid profile analysis of Salmonellae isolated from some meat products. *Benha University, Faculty of Veterinary Medicine*, Fourth Scientific Conference 25-27th May 2011 Veterinary Medicine and Food Safety) 194-201 *benha*, Egypt.
- Ragab A, Abobakr M. Edris, Fahim A.E. Shaltout, Amani M. Salem (2022): Effect of titanium dioxide nanoparticles and thyme essential oil on the quality of the chicken fillet. *BENHA VETERINARY MEDICAL JOURNAL* 41(2): 38-40.
- Hassan, M.A, Shaltout, F. A, Arfa M.M, Mansour A.H and Saudi, K. R (2013): biochemical studies on rabbit meat related to some diseases. *benha veterinary medical journal* 25(1): 88-93.
- Hassan, M.A and Shaltout, F.A. (1997): Occurrence of Some Food Poisoning Microorganisms In Rabbit Carcasses *Alex. J. Vet. Science*, 13(1): 55-61.
- Hassan M, Shaltout FA* and Saqr N (2020): Histamine in Some Fish Products. *Archives of Animal Husbandry & Dairy Science* 2(1): 1-3.
- Hassan, M.A and Shaltout, F.A. (2004): Comparative Study on Storage Stability of Beef, Chicken meat, and Fish at Chilling Temperature. *Alex. J. Vet. Science*, 20(21): 21-30.
- Hassan, M.A; Shaltout, F.A.; Arafa, M.M.; Mansour, A.H. and Saudi, K.R. (2013): Biochemical studies on rabbit meat related to some diseases. *Benha Vet. Med. J.* 25 (1): 88-93.
- Hassan, M.A; Shaltout, F.A.; Maarouf, A.A. and El-Shafey, W.S. (2014): Psychrotrophic bacteria in frozen fish with special reference to pseudomonas species. *Benha Vet. Med. J.* 27 (1): 78-83.
- Hassan, M.A; Shaltout, F.A.; Arafa, M.M.; Mansour, A.H. and Saudi, K.R. (2013): Bacteriological studies on rabbit meat related to some diseases. *Benha Vet. Med. J.* 25 (1): 94-99.
- Hassanin, F. S; Hassan, M.A., Shaltout, F.A., Nahla A. Shawqy and 2Ghada A. Abd-Elhameed (2017): Chemical criteria of chicken meat. *BENHA VETERINARY MEDICAL JOURNAL*, 33(2): 457-464.

26. Hassanin, F. S.; Hassan, M.A.; Shaltout, F.A. and Elrais-Amina, M.(2014): clostridium perfringens in vacuum packaged meat products. *benha veterinary medical journal*, 26(1):49-53.
27. Hassanien, F.S. ; Shaltout, F.A.; Fahmey, M.Z. and Elsukkary, H.F.(2020): Bacteriological quality guides in local and imported beef and their relation to public health. *Benha Veterinary Medical Journal* 39: 125-129.
28. Hassanin, F. S; Shaltout, F.A. and , Mostafa E.M(2013): Parasitic affections in edible offal. *Benha Vet. Med.J*.25 (2):34-39.
29. Hassanin, F. S; Shaltout, F.A., Lamada, H.M., Abd Allah, E.M.(2011): the effect of preservative (nisin) on the survival of listeria monocytogenes. *Benha veterinary medical journal* (2011)-special issue [I]: 141-145.
30. Khattab, E., Fahim Shaltout and Islam Sabik (2021): Hepatitis A virus related to foods. *BENHA VETERINARY MEDICAL JOURNAL* 40(1): 174-179.
31. Saad M. Saad, Fahim A. Shaltout , Amal A. A. Farag & Hashim F. Mohammed (2022): Organophosphorus Residues in Fish in Rural Areas. *Journal of Progress in Engineering and Physical Science* 1(1): 27-31.
32. Saif, M. , Saad S.M. , Hassanin, F. S; Shaltout FA, Marionette Zaghloul (2019): Molecular detection of enterotoxigenic Staphylococcus aureus in ready-to-eat beef products. *Benha Veterinary Medical Journal* 37 (2019) 7-11.
33. Saif, M. , Saad S.M. , Hassanin, F. S; Shaltout, F.A., Marionette Zaghloul (2019); Prevalence of methicillin-resistant Staphylococcus aureus in some ready-to-eat meat products. *Benha Veterinary Medical Journal* 37 (2019) 12-15.
34. Farag, A. A., Saad M. Saad¹, Fahim A. Shaltout¹, Hashim F. Mohammed (2023 a): Studies on Pesticides Residues in Fish in Menofia Governorate. *Benha Journal of Applied Sciences*. 8(5): 323-330.
35. Farag, A. A., Saad M. Saad¹, Fahim A. Shaltout¹, Hashim F. Mohammed (2023 b): Organochlorine Residues in Fish in Rural Areas. *Benha Journal of Applied Sciences*, 8 (5): 331-336.
36. Shaltout, F.A., Mona N. Hussein, Nada Kh. Elsayed (2023): Histological Detection of Unauthorized Herbal and Animal Contents in Some Meat Products. *Journal of Advanced Veterinary Research* 13(2): 157-160.
37. Shaltout, F. A. , Heikal, G. I. , Ghanem, A. M.(2022): Mycological quality of some chicken meat cuts in Gharbiya governorate with special reference to Aspergillus flavus virulent factors. *benha veteriv medical journal veterinary* 42(1): 12-16.
38. Shaltout, F.A., Ramadan M. Salem, Eman M. Eldiasty, Fatma A. Diab (2022): Seasonal Impact on the Prevalence of Yeast Contamination of Chicken Meat Products and Edible Giblets. *Journal of Advanced Veterinary Research* 12(5): 641-644.
39. Shaltout, F.A., Abdelazez Ahmed Helmy Barr and Mohamed Elsayed Abdelaziz (2022): Pathogenic Microorganisms in Meat Products. *Biomedical Journal of Scientific & Technical Research* 41(4): 32836-32843.
40. Shaltout, F.A., Thabet, M.G. and Koura, H.A. (2017). Impact of Some Essential Oils on the Quality Aspect and Shelf Life of Meat. *J Nutr Food Sci.*, 7: 647.
41. Shaltout, F.A.,, Islam Z. Mohammed², El -Sayed A. Afify(2020): Bacteriological profile of some raw chicken meat cuts in Ismailia city, Egypt. *Benha Veterinary Medical Journal* 39 (2020) 11-15.
42. Shaltout, F.A., Islam, Z. Mohammed², El -Sayed A. Afify(2020): Detection of E. coli O157 and Salmonella species in some raw chicken meat cuts in Ismailia province, Egypt. *Benha Veterinary Medical Journal* 39 (2020) 101-104.
43. Shaltout, F.A., E.M. El-diasty and M. A. Asmaa- Hassan (2020): HYGIENIC QUALITY OF READY TO EAT COOKED MEAT IN RESTAURANTS AT Cairo. *Journal of Global Biosciences* 8(12): 6627-6641..
44. Shaltout, F.A., Marrionet Z. Nasief , L. M. Lotfy , Bossi T. Gamil(2019): Microbiological status of chicken cuts and its products. *Benha Veterinary Medical Journal* 37 (2019) 57-63.
45. Shaltout, F.A. (2019): Poultry Meat. *Scholarly Journal of Food and Nutrition* 22 1-2..
46. Shaltout, F.A. (2019): Food Hygiene and Control. *Food Science and Nutrition Technology* 4(5): 1-2.
47. Hassanin, F. S; Shaltout, F.A., Seham N. Homouda and Safaa M. Arakeeb(2019): Natural preservatives in raw chicken meat. *Benha Veterinary Medical Journal* 37 (2019) 41-45.
48. Hazaa, W. , Shaltout, F.A., Mohamed El-Shate(2019): Prevalence of some chemical hazards in some meat products. *Benha Veterinary Medical Journal* 37 (2) 32-36.
49. Hazaa, W, Shaltout, F.A., Mohamed El-Shater(2019): Identification of Some Biological Hazards in Some Meat Products. *Benha Veterinary Medical Journal* 37 (2) 27-31.
50. Gaafar, R. , Hassanin, F. S; Shaltout, F.A., Marionette Zaghloul (2019): Molecular detection of enterotoxigenic Staphylococcus aureus in some ready to eat meat-based sandwiches. *Benha Veterinary Medical Journal* 37 (2) 22-26.
51. Gaafar, R. , Hassanin, F. S; Shaltout, F.A., Marionette Zaghloul(2019): Hygienic profile of some ready to eat meat product sandwiches sold in Benha city, Qalubiya Governorate, Egypt. *Benha Veterinary Medical Journal* 37 (2) 16-21.
52. Saad S.M. , Shaltout, F.A., Nahla A Abou Elroos, Saber B El-nahas(2019) : Antimicrobial Effect of Some Essential Oils on Some Pathogenic Bacteria in Minced Meat. *J Food Sci Nutr Res*. 2019; 2 (1): 012-020.
53. Saad S.M. , Shaltout, F.A., Nahla A Abou Elroos² and Saber B El-nahas(2019): Incidence of Staphylococci and E. coli in Meat and Some Meat Products. *EC Nutrition* 14.6 (2019).
54. Saad S.M. , Hassanin, F. S. ; Shaltout, F.A., Marionette Z Nassif, Marwa Z Seif.(2019): Prevalence of Methicillin-Resistant Staphylococcus Aureus in Some Ready-to-Eat Meat Products. *American Journal of Biomedical Science & Research* 4(6):460-464.
55. Shaltout, Fahim (2019): Pollution of Chicken Meat and Its Products by Heavy Metals. Research and Reviews on Healthcare: *Open Access Journal*, 4, 3(381-3382).
56. Shaltout, F. A.; E.M EL-diasty; M. S. M Mohamed (2018): Effects of chitosan on quality attributes fresh meat slices stored at 4 C. *BENHA VETERINARY MEDICAL JOURNAL*, VOL. 35, NO. 2: 157-168.
57. Shaltout and Abdel-Aziz, 2004: Salmonella enterica serovar Enteritidis in poultry meat and their epidemiology. *Vet. Med. J. Giza*, 52 (2004), pp. 429-436.
58. Shaltout, F.A., Hala F El-Shorah, Dina I El Zahaby, Lamiaa M Lotfy (2018): Bacteriological Profile of Chicken Meat Products. *SciFed Food & Dairy Technology Journal*, 2:3.

59. Shaltout, F.A., Mohamed, A.H. El-Shater, Wafaa Mohamed Abd El-Aziz (2015): Bacteriological assessment of Street Vended Meat Products sandwiches in kalyobia Governorate. *BENHA VETERINARY MEDICAL JOURNAL*, 28(2):58-66.
60. Shaltout, F.A., Mohamed A El shatter and Heba M Fahim (2019): Studies on Antibiotic Residues in Beef and Effect of Cooking and Freezing on Antibiotic Residues Beef Samples. *Scholarly Journal of Food and Nutrition* 2(1) 1-4
61. Shaltout FA, Zakaria IM and Nabil ME. (2018): Incidence of Some Anaerobic Bacteria Isolated from Chicken Meat Products with Special Reference to *Clostridium perfringens*. *Nutrition and Food Toxicology* 2.5 (2018): 429-438.
62. Shaltout FA, Ahmed A A Maarouf and Mahmoud ES Elkhoully. (2017): Bacteriological Evaluation of Frozen Sausage. *Nutrition and Food Toxicology* 1.5; 174-185.
63. Shaltout FA, El-Toukhy EI and Abd El-Hai MM. (2019): Molecular Diagnosis of *Salmonellae* in Frozen Meat and Some Meat Products. *Nutrition and Food Technology Open Access* 5(1): 1-6.
64. Shaltout, F.A., A.M.Ali and S.M.Rashad (2016): Bacterial Contamination of Fast Foods. *Benha Journal of Applied Sciences (BJAS)* 1 (2)45-51.
65. Shaltout, F.A., Zakaria. I. M., Jehan Eltanani , Asmaa . Elmelegy(2015): Microbiological status of meat and chicken received to University student hostel. *BENHA VETERINARY MEDICAL JOURNAL*, 29(2):187-192, DECEMBER, 2015.
66. Saad,S.M.;Edris, A.M.; Shaltout,F.A. and Edris, Shima(2012): Isolation and identification of salmonellae and *E.coli* from meat and poultry cuts by using A.multiplex PCR. *Benha Vet. Med.J.special issue* 16-26.
67. Saad, S.M. and Shaltout, F.A. (1998): Mycological Evaluation of camel carcasses at Kalyobia Abattoirs. *Vet.Med.J. Giza*,46(3):223-229.
68. Saad S.M., Shaltout, F.A., Nahla A Abou Elroos, Saber B El-nahas. 2019: Antimicrobial Effect of Some Essential Oils on Some Pathogenic Bacteria in Minced Meat. *J Food Sci Nutr Res.* 2019; 2 (1): 012-020.
69. Saad S.M., Hassanin, F. S; Shaltout, F.A., Marionette Z Nassif, Marwa Z Seif. (2019): Prevalence of Methicillin-Resistant *Staphylococcus Aureus* in Some Ready-to-Eat Meat Products. *American Journal of Biomedical Science & Research* 4(6):460-464.
70. Saad S.M., Shaltout, F.A., Nahla A Abou Elroos and Saber B El-nahas. (2019): Incidence of *Staphylococci* and *E. coli* in Meat and Some Meat Products. *EC Nutrition* 14.6 (2019).
71. Shaltout FA, Riad EM, TES Ahmed and AbouElhassan A.(2017): Studying the Effect of Gamma Irradiation on Bovine Offal's Infected with *Mycobacterium tuberculosis* Bovine Type. *Journal of Food Biotechnology Research* 1 (6): 1-5.
72. Shaltout FA, Zakaria IM and Nabil ME. (2018): Incidence of Some Anaerobic Bacteria Isolated from Chicken Meat Products with Special Reference to *Clostridium perfringens*. *Nutrition and Food Toxicology* 2.5 (2018): 429-438.
73. Shaltout FA, Mohamed, A.Hassan and Hassanin, F. S(2004): THERMAL INACTIVATION OF ENTEROHAEMORRHAGIC *ESCHERICHIA COLI* O157:H7 AND ITS SENSITIVITY TO NISIN AND LACTIC ACID CULTURES. *1st Ann. Confr. , FVM., Moshtohor*, Sept, 2004.
74. Shaltout FA, El-diasty, E.M. ;Elmeslami, M. and Elshaer, M.(2014): Study on fungal contamination of some chicken meat products with special reference to 2 the use of PCR for its identification . Conference, *Veterinary Medical Journal – Giza vol. December 2014/12/17 vol.60: 1-10.*
75. shaltout, F.A. (2002): Microbiological Aspects of Semi-cooked chicken Meat Products. *Benha Veterinary Medical Journal*13,2: 15-26.
76. Shaltout FA, Thabet, M.G2 and Hanan, A. Koura3. (2017): Impact of some essential oils on the quality aspect and shelf life of meat. *BENHA VETERINARY MEDICAL JOURNAL*, 33, (2): 351-364.
77. Shaltout FA, Mohammed Farouk; Hosam A.A. Ibrahim and Mostafa E.M. Afifi4.2017: Incidence of Coliform and *Staphylococcus aureus* in ready to eat fast foods. *BENHA VETERINARY MEDICAL JOURNAL*, 32(1): 13 - 17, MARCH, 2017.
78. Shaltout, F.A., Zakaria, I.M., Nabil, M.E. (2017): Detection and typing of *Clostridium perfringens* in some retail chicken meat products. *BENHA VETERINARY MEDICAL JOURNAL*, 33(2):283-291.
79. Shaltout, F.A. (1992): Studies on Mycotoxins in Meat and Meat by Products. M.V.Sc Thesis Faculty of Veterinary Medicine, Moshtohor,Zagazig University Benha branch.
80. Shaltout, F.A. (1996): Mycological And Mycotoxicological profile Of Some Meat products. Ph.D.Thesis, Faculty of Veterinary Medicine, Moshtohor, Zagazig University Benha branch.
81. Shaltout, F.A. (1998): Proteolytic Psychrotrophes in Some Meat products. *Alex. Vet. Med. J.*14 (2):97-107.
82. Shaltout, F.A. (1999): Anaerobic Bacteria in Vacuum Packed Meat Products. *Benha Vet. Med.J.*10 (1):1-10.
83. Shaltout,F.A. (2000):Protozoal Foodborne Pathogens in some Meat Products. *Assiut Vet. Med. J.* 42 (84):54-59.
84. Shaltout,F.A.(2001): Quality evaluation of sheep carcasses slaughtered at Kalyobia abattoirs. *Assiut Veterinary Medical Journal*, 46(91):150-159.
85. Shaltout, F.A. (2002): Microbiological Aspects of Semi-cooked Chicken Meat Products. *Benha Vet.Med.J.* 13(2):15-26.
86. Shaltout, F.A. (2003): *Yersinia Enterocolitica* in some meat products and fish marketed at Benha city. The Third international conference Mansoura 29-30 April.
87. Shaltout, F.A. (2009): Microbiological quality of chicken carcasses at modern Poultry plant. The 3rd Scientific Conference, Faculty of Vet. Med., Benha University, 1-3 january.
88. Shaltout,F.A. and Abdel Aziz ,A.M.(2004): *Salmonella enterica* Serovar Enteritidis in Poultry Meat and their Epidemiology .*Vet.Med.J.,Giza*,52(3):429-436.
89. Shaltout,F.A. and Abdel Aziz ,A.M.(2004): *ESCHERICHIA COLI* STRAINS IN SLAUGHTERED ANIMALS AND THEIR PUBLIC HEALTH IMPORTENCE. *J.Egypt. Vet. Med. Association* 64(2):7-21.
90. Shaltout,F.A., Amin, R., Marionet , Z., Nassif and Shima, Abdel-wahab(2014): Detection of aflatoxins in some meat products. *Benha veterinary medical journal* , 27(2):368-374.
91. Shaltout,F.A. and Afify , Jehan Riad,EM and Abo Elhasan , Asmaa,A.(2012): Improvement of microbiological status of

- oriental sausage. *Journal of Egyptian Veterinary Medical Association* 72(2):157-167.
92. Shaltout, F.A. and Daoud, J. R. (1996): Chemical analytical studies on rabbit meat and liver. *Benha Vet. Med. J.* 8 (2):17-27.
 93. Shaltout, F.A. and Edris, A.M. (1999): Contamination of shawarma with pathogenic yeasts. *Assiut Veterinary Medical Journal*, 40(64):34-39.
 94. Shaltout, F. A. ; Eldiasty, E. and Mohamed, M.S. (2014): Incidence of lipolytic and proteolytic fungi in some chicken meat products and their public health significance. Animal Health Research Institute : First International Conference on Food Safety and Technology 19-23 June 2014 *Cairo Egypt pages* 79-89.
 95. Shaltout, F.A.; Eldiasty, E. ; Salem, R. and Hassan, Asmaa (2016): Mycological quality of chicken carcasses and extending shelf – life by using preservatives at refrigerated storage. *Veterinary Medical Journal -Giza (VMJG)* 62(3)1-7.
 96. Shaltout, F.A.; Salem, R. Eldiasty, E. ; and Diab, Fatema. (2016): Mycological evaluation of some ready to eat meat products with special reference to molecular characterization. *Veterinary Medical Journal -Giza* 62(3)9-14.
 97. Shaltout, F. A. ; Elshater, M. and Wafaa, Abdelaziz (2015): Bacteriological assessment of street vended meat products sandwiches in Kalyobia Governorate. *Benha Vet. Med. J.* 28 (2):58-66.
 98. Shaltout, F. A. ; Gerges, M.T. and Shewail, A.A. (2018): Impact of Organic Acids and Their Salts on Microbial Quality and Shelf Life of Beef. *Assiut veterinary medical journal* 64(159): 164-177
 99. Shaltout, F.A.; Ghoneim, A.M.; Essmail, M.E. and Yousseif, A. (2001): Studies on aflatoxin B1 residues in rabbits and their pathological effects. *J. Egypt. Vet. Med. Association* 61(2):85-103.
 100. Shaltout, F.A. and Hanan, M.T. El-Lawendy (2003): Heavy Metal Residues In Shawarma. *Beni-Suef Vet. Med. J.* 13(1):213-224.
 101. Shaltout, F.A. and Hashim, M.F. (2002): Histamine in salted, Smoked and Canned Fish products. *Benha Vet. Med. J.* 13 (1):1-11.
 102. Shaltout, F.A. ; Hashim, M.F. and Elnahas, S. (2015): Levels of some heavy metals in fish (tilapia nilotica and Claris lazera) at Menufia Governorate. *Benha Vet. Med. J.* 29 (1):56-64.
 103. Shaltout, F.A. and Ibrahim, H.M. (1997): Quality evaluation of luncheon and Alexandrian sausage. *Benha Vet. Med. J.* 10 (1):1-10.
 104. Shaltout, F.A. ; Nassif, M and Shakran, A (2014): Quality of battered and breaded chicken meat products. *Global Journal of Agriculture and Food Safety Science* – 1(2) ISSN 2356-7775.
 105. Shaltout, F.A., Amani M. Salem, A. H. Mahmoud, K. A (2013): Bacterial aspect of cooked meat and offal at street vendors level. *Benha veterinary medical journal*, 24(1): 320-328.
 106. Shaltout, F.A. and Salem, R.M. (2000): Moulds, aflatoxin B1 and Ochratoxin A in Frozen Livers and meat products. *Vet. Med. J. Giza* 48(3):341-346.
 107. Yasser H. Al-Tarazi, A. Al-Zamil, Shaltout FA. and H. Abdel-Samei (2002). Microbiological status of raw cow milk marketed in northern Jordan. *AVMJ Volume* 49 Issue 96 Pages 180-194
 108. Shaltout FA, Zakaria IM and Nabil ME. (2018): Incidence of Some Anaerobic Bacteria Isolated from Chicken Meat Products with Special Reference to Clostridium perfringens. *Nutrition and Food Toxicology* 2(5):429-438.
 109. Shaltout, F. A.; El-diasty, E.M. and Mohamed, M. S. (2014): Incidence of lipolytic and proteolytic fungi in some chicken meat products and their public health significance. 1st Scientific conference of food safety and Technology .2014, pp. 79-89.
 110. Shaltout, F. A.; El-diasty, E.M.; Salem, R. M. and Asmaa, M. A. Hassan (2016). 2016: Mycological quality of chicken carcasses and extending shelf -life by using preservatives at refrigerated storage. *Veterinary Medical Journal – Giza*, 62(3) :1-10.
 111. Shaltout FA, R.M. Salem, E.M. El-Diasty and W.I.M. Hassan. 2019: Effect of Lemon Fruits and Turmeric Extracts on Fungal Pathogens in Refrigerated Chicken Fillet Meat. *Global Veterinaria* 21 (3): 156-160,
 112. Shaltout FA, El-diasty, E.M.; Elmeslamy, M. and Elshaer, M. (2014): Study on fungal contamination of some chicken meat products with special reference to the use of PCR for its identification. Conference, *Veterinary Medical Journal – Giza* vol. December 2014/12/17 vol.60 1-10.
 113. Shaltout, F. A.; Salem, R. M; El-diasty, Eman and Fatema, A.H. Diab. (2016): Mycological evaluation of some ready to eat meat products with special reference to molecular characterization. *Veterinary Medical Journal – Giza*. 62(3): 9-14.
 114. Shaltout FA, Ahmed, A.A. Maarouf, Eman, M.K. Ahmed (2018): Heavy Metal Residues in chicken cuts up and processed chicken meat products. *BENHA VETERINARY MEDICAL JOURNAL*, 34(1): 473-483.
 115. Shaltout, F.A.; Hanan M. Lamada, Ehsan A.M. Edris. (2020): Bacteriological examination of some ready to eat meat and chicken meals. *Biomed J Sci & Tech Res.*, 27(1): 20461- 20465.
 116. Sobhy, Asmaa and Shaltout, Fahim (2020): Prevalence of some food poisoning bacteria in semi cooked chicken meat products at Qaliubiya governorate by recent Vitek 2 compact and PCR techniques. *Benha Veterinary Medical Journal* 38 (2020) 88-9.
 117. Sobhy, Asmaa and Shaltout, Fahim (2020): Detection of food poisoning bacteria in some semi-cooked chicken meat products marketed at Qaliubiya governorate. *Benha Veterinary Medical Journal* 38 (2020) 93-96.
 118. Shaltout, F.A. (2024): Abattoir And Bovine Tuberculosis as A Reemerging Foodborne Disease. *Clinical Medical Reviews and Report* 6(1):1-7.
 119. Shaltout, F.A. (2023): Viruses in Beef, Mutton, Chevon, Venison, Fish and Poultry Meat Products. *Food Science & Nutrition Technology* 8(4):1-10.

Ready to submit your research? Choose ClinicSearch and benefit from:

- fast, convenient online submission
- rigorous peer review by experienced research in your field
- rapid publication on acceptance
- authors retain copyrights
- unique DOI for all articles
- immediate, unrestricted online access

At ClinicSearch, research is always in progress.

Learn more <https://clinicsearchonline.org/journals/clinical-trials-and-case-studies>



© The Author(s) 2024. **Open Access** This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>. The Creative Commons Public Domain Dedication waiver (<http://creativecommons.org/publicdomain/zero/1.0/>) applies to the data made available in this article, unless otherwise stated in a credit line to the data.