

# The Relationship Between Cross Food Contamination and Foodborne Illness Due to Drug-Resistant Bacteria

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## Abstract

Cross food contamination means transportation of bacteria or other microorganisms from one substance to the food. Cross food contamination can happen during any stage of food production. Each year, many people worldwide experience a foodborne illness, while there are a few causes, the most common preventable one is cross food contamination. Cross food contamination as Bacterial cross food contamination is defined as the transportation of bacteria or other microorganisms from one substance to food. Other types of cross food contamination include the transportation of food allergens, chemicals, or toxins. Foodborne illness may cause by eating at restaurants, but there are many ways in which cross food contamination can occur, including, primary food production, from plants and animals on farms, during harvest or slaughtering of food animals, secondary food production including food processing and manufacturing, transportation of food, storage of food, distribution of food, grocery stores, farmer's markets, and more, food preparation and serving at home, restaurants, and other foodservice operations, Given that there are many points at which cross food contamination can occur, it's important to learn about the different types and how we can prevent cross food contamination.

**Keywords:** foodborne illness; cross food contamination; drug-resistant bacteria; food

## 1. Introduction

The term cross food contamination generally refers to food contamination from other sources. Where this cross-food contamination is considered as one of the most prevalent foodborne illnesses in humans, producing well-recognized detrimental effects on human health and profitability of poultry, fish, dairy, meat, and other human foods [1-4]. Besides health disorders of the humans, cross food contamination can also cause significant losses in food yield, alterations in its quality (impaired nutritive and technological properties of food), fertility disorders and even systemic diseases may also occur [5-9], microorganisms causing cross food contamination to carry a health risk for human populations via the food chain [10-13]. The disease affects many humans throughout the world because of rich nutritional contents and the production and processing procedures in commercial food production that render it

susceptible to contamination by pathogenic microbes that could cause diseases in humans [14-17]. Cross-food contamination is a complex multi-factorial disease, occurs depending on variables related to the animals, environment, and pathogens [18-22]. Among these pathogens, bacterial agents are the most common and widely distributed in the environment. The microbial causes of cross food contamination include a wide variety of micro-organisms (aerobic and anaerobic bacteria, mycoplasmas, yeasts, and fungi). Of these microorganisms the *Staphylococcus aureus*, *Escherichia coli* and other coliforms are the most common causes of contagious and environmental clinical cross food contamination [23-26]. Cross food contamination occurred most frequently by bacteria causing disease, where the sanitary conditions are important component of their prevention, this indiscriminate use of antimicrobials has led to the development of multidrug-resistant (MDR) Gram-

negative bacteria in raw food, in particular *E. coli* O157:H7, *Klebsiella pneumoniae* (*K. pneumoniae*), *Aeromonas hydrophilia* (*A. hydrophilia*), and *Proteus mirabilis* (*P. mirabilis*) [27-31]. From these multidrug-resistant (MDR) bacteria, the Coagulase-positive Staphylococci and *Escherichia Coli* are of real concern for public health; they can be a reservoir for antimicrobial resistance (AMR) genes and can play a role in the spread of genes to other pathogenic and commensal bacteria in the farm environment [32-35]. *Staphylococcus aureus* and other coagulase-positive staphylococci (CoPS) are zoonotic, opportunistic and facultative pathogenic bacteria that pathogens associated with a large spectrum of diseases in humans [36-38]. The intoxication caused by *S. aureus* ranks third out of common food poisoning causes, and it is associated with consumption of different categories of food including raw food and dairy products, subsequently the organism can cause a multitude of infections due to the expression of various toxins, virulence factors, and cell wall adhesion proteins [39-42]. *Escherichia coli* is one of the most important pathogens inducing clinical environmental cross food contamination, this organism is ubiquitous in the farm where healthy animals, even humans, are the carriers of this pathogen subsequently improper food procedures, season changing, behaviour or weakened host immunity can provide opportunities for intramammary infection of *E. coli* [43-46]. Cross food contamination caused by *Escherichia coli* can range from being a subclinical infection of the mammary gland to a severe systemic disease, whereas human-dependent factors such as sex and age affect the severity of *E. coli* cross food contamination [47-50]. Lipopolysaccharide (LPS), a component of the cell wall of gram-negative bacteria, is the primary virulence factor in coliform bacteria, being responsible for most pathophysiological reactions in *E. coli* cross food contamination [51-54]. The characterization of the antibiotic-resistance profile of these bacteria that causes cross food contamination is crucial for a correct antibiotic choice and an effective treatment. The antimicrobial resistance patterns and biofilm formation of coagulase-positive staphylococci and *Escherichia coli* isolated from cow meat samples. The antimicrobial resistance patterns and biofilm formation of coagulase-positive staphylococci and *Escherichia coli* isolated from cross food contamination [55-58].

### 1.1 Main Types of food cross contamination,

There are three main types of cross food contamination, food to food, equipment to food, and people to food cross food contamination [1], [2], [59], [60], [61].

### 1.2 Food to food cross food contamination

Add contaminated foods to non-contaminated foods leading to food-to-food cross food contamination [62], [63], [3], [4], [5]. This allows harmful drug-resistant bacteria to spread and populate. Raw, undercooked, or improperly washed food can harbour large amounts of drug-resistant bacteria, such as *Salmonella*, *Clostridium perfringens*, *Campylobacter*, *Staphylococcus aureus*, *E. coli*, and *Listeria monocytogenes*, all of which could harm our health if we consumed it [6], [64], [7], [65], [66]. Foods that pose the highest risk of bacterial contamination include leafy greens, bean sprouts, leftover rice, unpasteurized milk, soft cheeses, and deli meats, as well as raw eggs, chicken, meat, and seafood [67], [8], [68], [69], [9]. For example, adding unwashed, contaminated lettuce to a fresh salad can contaminate the other ingredients [70-73]. This was the case in the *E. Coli* outbreak that affected customers. What's more, leftovers kept in the fridge too long time can cause bacterial overgrowth. Therefore, eat leftovers within a few days and cook them to proper temperatures [74-77]. If we plan to mix leftovers with other foods, the new meal should not be stored again as leftovers [78-82].

### 1.3 From the equipment to the food type of cross food contamination

From the equipment to the food type of cross food contamination is one of the most common yet unrecognized types of cross food contamination [83-86]. Bacteria can survive for long periods on surfaces like countertops, utensils, cutting boards, storage containers, and food manufacturing equipment [87-90]. When equipment is not washed properly or unknowingly contaminated with drug-resistant bacteria, Cross food contamination can transport large volumes of harmful drug-resistant bacteria to food [91-94]. From the equipment to the food type of cross food contamination can happen at any point during food production, both at home and in food manufacturing places [95-98]. Sliced meat caused death of customers due to *listeria*-contaminated meat slicers [99-103]. A common example of this occurring at home is using the same cutting board and knife to cut raw meat and vegetables, which are harmful if the vegetables are then consumed raw [104-107]. Older participants were less likely to clean their cutting boards after working with raw meat, while children weren't aware of the risks of cross food contamination [108-112]. Thus, more food safety awareness seems to be used across all ages [113-117]. Improper food preservation methods cause cross food contamination. In home-canned potatoes used in a potato salad made potluck attendees sick with food poisoning botulism due to inefficient canning operation [118], [55-58].

#### 1.4 From human to food cross food contamination

Humans can easily transport drug-resistant bacteria from their bodies or clothes to food during handling of food preparations [51-54] and [47]. A person may cough into their hand or touch raw chicken meat and continue to prepare food without washing their hands in between. Hand washing before cooking or preparing food, while washed hands after sneezing or coughing lower hand contamination [48-50], [43-45]. Using a cell phone that's loaded with drug-resistant bacteria while cooking or wiping hands with a dirty apron or towel. These practices may contaminate hands and spread drug resistant bacteria to food or equipment [46], [39-42]. Food safety awareness both at the home and at work can significantly lower the risk of cross food contamination and unsafe food practices. By far, the most effective way to reduce the risk of cross food contamination is to wash hands [36-38], [32-34]. There are three main types of cross food contamination, food to food, equipment to food, and people to food. In each type, drug-resistant bacteria are transported from a contaminated source to uncontaminated food [35], [27-30].

#### 1.5 Effects of cross food contamination on the consumer

The effects of cross food contamination can be mild to severe. Minor side effects include upset human stomach, loss of appetite, headache, nausea, and diarrhoea. Usually, these effects present within one day, although they can appear weeks after exposure, making it difficult to determine the specific cause. In cases involving vomiting or diarrhoea, it's important to rehydrate properly for example with a sports beverage to restore hydration, blood sugar level, and electrolyte levels. Severe side effects include diarrhoea for more than three days, bloody stools, fever, dehydration, organ failure, and even death. Seek immediate medical attention if our side effects worsen or last longer than one to two days, as well as if we're considered to be at risk population [31], [23-26]. Effects of cross food contamination range from human stomach upset to more severe aftereffects, including dehydration, organ function failure, and even death may occur [18-22].

#### 1.6 Peoples at risk of cross food contamination

Everyone in human is at risk of becoming sick from cross food contamination. Certain groups are at a much higher risk, including, pregnant females, children under the age of five years, adults over the age of 65 years, those with weakened immune systems, as people with HIV/AIDS, uncontrolled diabetes, or cancer, considering these groups make up a large number of the population, it's important to practice safe food

handling when at home or working in a foodservice establishment [14-17] and [10]. Anyone is at risk of becoming sick from cross food contamination. However, certain groups, including pregnant females, children, older adults, and those with weakened immune systems, are at the highest risk [17], [10-13].

#### 1.7 Avoidance rules of cross food contamination

There are many ways to avoid cross food contamination such as food purchasing and storage, avoid purchasing food after its expiration date, unless we intend to eat it right away [14-17]. Store raw meat in a sealed suitable container or suitable plastic bag on the bottom shelf of the refrigerator to prevent juices from leaking onto other foods [10-13]. Use separate grocery suitable bags for raw meat and eggs. Use refrigerated leftover food within 2-3 days and cook it to proper temperatures [20-22], [15], [16]. Food preparation, by washing hands with soap and water after touching raw meat, petting an animal, uses the washroom, coughing or sneezing. Washing utensils, counter tops, cutting boards, and other surfaces, especially when handling raw meat. Use separate cutting boards for meat, fish, chicken, and vegetables. Use clean sponges and dishcloths. Thorough cooking of the foods to their proper temperatures. Food recalls by visiting the website of food and disease control boards [24-26], [18], [19]. Bacterial cross food contamination can have dangerous and even fatal consequences, but it's easy to prevent. Practice good hygiene, wash and sanitize the equipment, and properly store and serve food to prevent cross food contamination. In addition, it's a good idea to stay up to date with food recalls, which are available online. By practicing safe food handling, we can protect ourselves and others from getting sick [28-31] and [23].

## 2. Conclusion

There is positive relationship between Cross food Contamination and foodborne illness by application of Proper food safety and food hygiene practices we can reduce risk of cross food contamination. By thoroughly hand washing and surfaces, proper storage of food, and stay up to date apply food recalls.

## 3. References

1. Shaltout FA, Riad EM, AbouElhassan Asmaa: prevalence Of Mycobacterium Tuberculosis in Imported cattle Offals and Its lymph Nodes. Veterinary Medical Journal -Giza (VMJG). 2017; 63: 115-122.
2. Shaltout FA, Riad EM, Asmaa Abou-Elhassan: Prevalence of Mycobacterium Spp . In Cattle Meat and Offal's Slaughtered in And Out Abattoir. Egyptian Veterinary medical Association. 2017; 77: 407-420.

3. Edris A, Hassan MA, Shaltout FA, Elhosseiny S: Chemical evaluation of cattle and camel meat. *BENHA VETERINARY MEDICAL JOURNAL*. 2013; 24: 191-197.
4. Edris AM, Hassan MA, Shaltout FA, Elhosseiny S: Detection of E.coli and Salmonella organisms in cattle and camel meat. *BENHA VETERINARY MEDICAL JOURNAL*. 2012; 24: 198-204.
5. Edris AM, Hemmat MI, Shaltout FA, Elshater MA, Eman FMI: STUDY ON INCIPIENT SPOILAGE OF CHILLED CHICKEN CUTS-UP. *BENHA VETERINARY MEDICAL JOURNAL*. 2012; 23: 81-86.
6. Edris AM, Hemmat MI, Shaltout FA, Elshater MA, Eman FMI: CHEMICAL ANALYSIS OF CHICKEN MEAT WITH RELATION TO ITS QUALITY. *BENHA VETERINARY MEDICAL JOURNAL*. 2012; 23: 87-92.
7. Edris AM, Shaltout FA, Arab WS: Bacterial Evaluation of Quail Meat. *Benha Vet. Med.J*. 2005; 16: 1-14.
8. Ragab A, Abobakr M Edris, Shaltout FA, Amani M Salem: Effect of titanium dioxide nanoparticles and thyme essential oil on the quality of the chicken fillet. *BENHA VETERINARY MEDICAL JOURNAL*. 2022; 41: 38-40.
9. Hassan M, Shaltout FA, Saqur N: Histamine in Some Fish Products. *Archives of Animal Husbandry & Dairy Science*. 2020; 2: 1-3.
10. Shaltout FA, Ahmed AA Maarouf, Eman MK Ahmed: Heavy Metal Residues in chicken cuts up and processed chicken meat products. *BENHA VETERINARY MEDICAL JOURNAL*. 2018; 34: 473-483.
11. Shaltout FA, Hanan M Lamada, Ehsan AM Edris: Bacteriological examination of some ready to eat meat and chicken meals. *Biomed J Sci & Tech Res*. 2020; 27: 20461-20465.
12. Sobhy Asmaa, Shaltout FA: 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*. 2020; 38: 88-92.
13. Sobhy Asmaa, Shaltout FA: Detection of food poisoning bacteria in some semi-cooked chicken meat products marketed at Qaliubiya governorate. *Benha Veterinary Medical Journal*. 2020; 38: 93-96.
14. Shaltout FA, El-diasty EM, Salem RM, Asmaa MA Hassan: Mycological quality of chicken carcasses and extending shelf -life by using preservatives at refrigerated storage. *Veterinary Medical Journal – Giza*. 2016; 62: 1-10.
15. Shaltout FA, RM Salem, EM El-Diasty, WIM Hassan: Effect of Lemon Fruits and Turmeric Extracts on Fungal Pathogens in Refrigerated Chicken Fillet Meat. *Global Veterinaria*. 2019; 21: 156-160.
16. Shaltout FA, El-diasty EM, Elmesalamy M, Elshaer M: 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; 60: 1-10*.
17. Shaltout FA Salem RM, El-diasty Eman, Fatema AH Diab: Mycological evaluation of some ready to eat meat products with special reference to molecular characterization. *Veterinary Medical Journal – Giza*. 2016; 62: 9-14.
18. Shaltout FA, Amani M, Salem AH, Mahmoud KA: Bacterial aspect of cooked meat and offal at street vendor's level .*Benha veterinary medical journal*. 2013; 24: 320-328.
19. Shaltout FA, Salem RM: Moulds, aflatoxin B1 and Ochratoxin A in Frozen Livers and meat products. *Vet . Med. J.Giza*. 2000; 48: 341-346.
20. Yasser H Al-Tarazi, AAI-Zamil, Shaltout FA, H Abdel-Samei: Microbiological status of raw cow milk marketed in northern Jordan. *AVMJ*. 2002; 49: 180-194.
21. Shaltout FA, Zakaria IM, Nabil ME: Incidence of Some Anaerobic Bacteria Isolated from Chicken Meat Products with Special Reference to Clostridium perfringens. *Nutrition and Food Toxicology*. 2018; 2: 429-438.
22. Shaltout FA, El-diasty EM, Mohamed MS: Incidence of lipolytic and proteolytic fungi in some chicken meat products and their public health significance. *1st Scientific conference on food safety and Technology*. 2014: 79-89.
23. Shaltout FA, Hashim MF: Histamine in salted, Smoked and Canned Fish products. *Benha Vet. Med.J*. 2002; 13: 1-11.
24. Shaltout FA, Hashim MF, Elnahas S: Levels of some heavy metals in fish (tilapia nilotica and Claris lazera) at Menufia Governorate. *Benha Vet. Med.J*. 2015; 29: 56-64 .
25. Shaltout FA, Ibrahim HM: Quality evaluation of luncheon and Alexandrian sausage. *Benha Vet. Med.J*. 1997; 10: 1-10.
26. Shaltout FA, Nassif M, Shakran A: Quality of battered and breaded chicken meat products. *Global Journal of Agriculture and Food Safety Science*. 2014; 1: 283-299.

27. Shaltout FA, Salem R, Eldiasty E, Diab Fatema: Mycological evaluation of some ready to eat meat products with special reference to molecular characterization. *Veterinary Medical Journal -Giza*. 2016; 62: 9-14.
28. Shaltout FA, Elshater M, Wafaa Abdelaziz: Bacteriological assessment of street vended meat products sandwiches in Kalyobia Governorate . *Benha Vet. Med.J*. 2015; 28: 58-66.
29. Shaltout FA, Gerges MT, Shewail AA: Impact of Organic Acids and Their Salts on Microbial Quality and Shelf Life of Beef. *Assiut veterinary medical journal*. 2018; 64: 164-177.
30. Shaltout FA, Ghoneim AM, Essmail ME, Yousseif A: Studies on aflatoxin B1 residues in rabbits and their pathological effects. *J.Egypt. Vet. Med. Association*. 2001; 61: 85-103.
31. Shaltout FA, Hanan MT, El-Lawendy: Heavy Metal Residues in Showerma. *Beni-Suef Vet.Med.J*. 2003; 13: 213-224.
32. Shaltout FA, Daoud JR: Chemical analytical studies on rabbit meat and liver. *Benha Vet. Med.J*. 1996; 8: 17-27.
33. Shaltout FA, Edris AM: Contamination of showerma with pathogenic yeasts. *Assiut Veterinary Medical Journal*. 1999; 41: 170-176.
34. Shaltout FA, Eldiasty E, Mohamed MS: 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 2014*; 79-89.
35. Shaltout FA, Eldiasty E Salem R, Hassan Asmaa: Mycological quality of chicken carcasses and extending shelf – life by using preservatives at refrigerated storage. *Veterinary Medical Journal -Giza*. 2016; 62: 1-7.
36. Shaltout FA, Abdel Aziz AM: ESCHERICHIA COLI STRAINS IN SLAUGHTERED ANIMALS AND THEIR PUBLIC HEALTH IMPORTENCE. *J.Egypt. Vet. Med. Association*. 2004; 64: 7-21.
37. Shaltout FA, Amin R, Marionet Z Nassif, Shima Abdel-wahab: Detection of aflatoxins in some meat products. *Benha veterinary medical journal*. 2014; 27: 368-374.
38. Shaltout FA, Afify Jehan Riad EM, Abo Elhasan, Asmaa A: Improvement of microbiological status of oriental sausage. *Journal of Egyptian Veterinary Medical Association*. 2012; 72: 157-167.
39. Shaltout FA: Microbiological Aspects of Semi-cooked Chicken Meat Products. *Benha Vet.Med.J*. 2002; 13: 15-26.
40. Shaltout FA: Microbiological quality of chicken carcasses at modern Poultry plant. *The 3rd Scientific Conference, Faculty of Vet. Med., Benha University*. 2009; 1-3.
41. Shaltout FA, Abdel Aziz AM: Salmonella enterica Serovar Enteritidis in Poultry Meat and their Epidemiology .*Vet. Med. J.Giza*. 2004; 52: 429-436.
42. Shaltout FA: Proteolytic Psychrotrophes in Some Meat products. *Alex. Vet. Med. J*. 1998; 14: 97-107.
43. Shaltout FA: Anaerobic Bacteria in Vacuum Packed Meat Products. *Benha Vet. Med*. 1999; 10: 1-10.
44. Shaltout FA: Protozoal Foodborne Pathogens in some Meat Products. *Assiut Vet. Med. J*. 2000; 42: 54-59.
45. Shaltout FA: Quality evaluation of sheep carcasses slaughtered at Kalyobia abattoirs. *Assiut Veterinary Medical Journal*. 2001; 46: 150-159.
46. Shaltout FA, Mohammed Farouk, Hosam AA Ibrahim, Mostafa EM: Incidence of Coliform and Staphylococcus aureus in ready to eat fast foods. *BENHA VETERINARY MEDICAL JOURNAL*. 2017; 32: 13-17.
47. Shaltout FA, Zakaria IM, Nabil ME: Detection and typing of Clostridium perfringens in some retail chicken meat products. *BENHA VETERINARY MEDICAL JOURNAL*. 2017; 33: 283-291.
48. Shaltout FA: Studies on Mycotoxins in Meat and Meat by Products. *M.V.Sc Thesis Faculty of Veterinary Medicine, Moshtohor, Zagazig University Benha branch*. 1992.
49. Shaltout FA: Mycological and Mycotoxicological profile Of Some Meat products. *Ph.D.Thesis, Faculty of Veterinary Medicine, Moshtohor, Zagazig University Benha branch*. 1996.
50. Shaltout FA, Mohamed A.Hassan, Hassanin FS: THERMAL INACTIVATION OF ENTEROHAEMORRHAGIC ESCHERICHIA COLI O157:H7 AND ITS SENSITIVITY TO NISIN AND LACTIC ACID CULTURES. *1rst Ann. Confr. , FVM., Moshtohor, Sept, 2004*.
51. Shaltout FA, El-diasty EM, Elmesalamy M, Elshaer M: 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*; 60: 1-10.
52. Shaltout FA: Microbiological Aspects of Semi-cooked chicken Meat Products. *Benha Veterinary Medical Journal*. 2002; 13: 15-26.
53. Shaltout FA, Thabet MG, Hanan A Koura: Impact of some essential oils on the quality aspect and shelf life of meat. *BENHA VETERINARY MEDICAL JOURNAL*. 2017; 33: 351-364.

54. Saad SM, Shaltout FA, Nahla A Abou Elroos, Saber B El-nahas: Incidence of Staphylococci and E. coli in Meat and Some Meat Products. *EC Nutrition*. 2019.
55. Shaltout FA, Riad EM, TES Ahmed, AbouElhassan A: Studying the Effect of Gamma Irradiation on Bovine Offal's Infected with Mycobacterium tuberculosis Bovine Type. *Journal of Food Biotechnology Research*. 2017; 1: 1-5.
56. Shaltout FA, Ahmed A A Maarouf, Mahmoud ES Elkhouly: Bacteriological Evaluation of Frozen Sausage. *Nutrition and Food Toxicology*. 2017: 174-185.
57. Abd Elaziz O, Fatin S Hassanin, Shaltout FA, Othman A Mohamed: Prevalence of Some Foodborne Parasitic Affection in Slaughtered Animals in Local Egyptian Abattoir. *Journal of Nutrition, Food Science and Technology*. 2021; 2: 1-5.
58. Abd Elaziz O, Hassanin FS, Shaltout FA, Mohamed OA: Prevalence of some zoonotic parasitic affections in sheep carcasses in a local abattoir in Cairo, Egypt. *Advances in Nutrition & Food Science*. 2021; 6: 25-31.
59. Al Shorman AAM, Shaltout FA, hilat N: 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*. 1999; 23-25.
60. Ebeed Saleh, Shaltout FA, Essam Abd Elaal: Effect of some organic acids on microbial quality of dressed cattle carcasses in Damietta abattoirs, Egypt. *Damanhour Journal of Veterinary Sciences*. 2021; 5: 17-20.
61. Edris A, Hassanin FS, Shaltout FA, Azza H Elbaba, Nairoz M Adel: Microbiological Evaluation of Some Heat-Treated Fish Products in Egyptian Markets. *EC Nutrition*. 2017; 124-132.
62. Edris AM, Shaltout FA, Abd Allah AM: Incidence of Bacillus cereus in some meat products and the effect of cooking on its survival. *Zag. Vet. J*. 2005; 33: 118-124.
63. Edris AM, Shaltout FA, Salem GH, El-Toukhy EI: 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)*. 2011; 172-179.
64. Edris AA, Hassanin FS, Shaltout FA, Azza H Elbaba, Nairoz M Adel: Microbiological Evaluation of Some Heat-Treated Fish Products in Egyptian Markets. *EC Nutrition*. 2017: 305-316.
65. Edris AM, Shaltout FA, Salem GH, El-Toukhy EI: 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)*. 2011; 194-201.
66. Hassan MA, Shaltout FA, Arfa MM, Mansour AH, Saudi KR: BIOCHEMICAL STUDIES ON RABBIT MEAT RELATED TO SOME DISEASES. *BENHA VETERINARY MEDICAL JOURNAL*. 2013; 25: 88-93.
67. Hassan MA, Shaltout FA: Occurrence of Some Food Poisoning Microorganisms in Rabbit Carcasses *Alex.J.Vet.Science*. 1997; 13: 55-62.
68. Hassan M, Shaltout FA, Saqur N: Histamine in Some Fish Products. *Archives of Animal Husbandry & Dairy Science*. 2020; 2: 1-3.
69. Hassan MA, Shaltout FA: Comparative Study on Storage Stability of Beef, Chicken meat, and Fish at Chilling Temperature. *Alex.J.Vet.Science*. 2004; 20: 21-30.
70. Hassan MA, Shaltout FA, Arafa MM, Mansour AH, Saudi KR: Biochemical studies on rabbit meat related to some diseases. *Benha Vet. Med.J*. 2013; 25: 88-93.
71. Hassan MA, Shaltout FA, Maarouf AA, El-Shafey WS: Psychrotrophic bacteria in frozen fish with special reference to pseudomonas species .*Benha Vet. Med.J*. 2014; 27: 78-83.
72. Hassan MA, Shaltout FA, Arafa MM, Mansour AH, Saudi KR: Bacteriological studies on rabbit meat related to some diseases. *Benha Vet. Med.J*. 2013; 25: 94-99.
73. Hassanin FS, Hassan MA, Shaltout FA, Nahla A Shawqy, Ghada A Abd-Elhameed: Chemical criteria of chicken meat. *BENHA VETERINARY MEDICAL JOURNAL*. 2017; 33: 457-464.
74. Hassanin FS, Hassan MA, Shaltout FA, Elrais-Amina M: CLOSTRIDIUM PERFRINGENS IN VACUUM PACKAGED MEAT PRODUCTS. *BENHA VETERINARY MEDICAL JOURNAL*. 2014; 26: 49-53.
75. Hassanien FS, Shaltout FA, Fahmey MZ, Elsukkary HF: Bacteriological quality guides in local and imported beef and their relation to public health. *Benha Veterinary Medical Journal*. 2020; 39: 125-129.
76. Hassanin FS, Shaltout FA, Mostafa EM: Parasitic affections in edible offal. *Benha Vet. Med.J*. 2013; 25: 34-39.
77. Hassanin FS, Shaltout FA, Lamada HM, Abd Allah EM: THE EFFECT OF PRESERVATIVE (NISIN) ON THE SURVIVAL OF LISTERIA MONOCYTOGENES. *BENHA VETERINARY MEDICAL JOURNAL*. 2011: 141-145.
78. Khattab E, Shaltout FA, Islam Sabik: Hepatitis A virus related to foods. *BENHA VETERINARY MEDICAL JOURNAL*. 2021; 40: 174-179.

79. Saad M Saad, Shaltout FA, Amal A A Farag, Mohammed HF: Organophosphorus Residues in Fish in Rural Areas. *Journal of Progress in Engineering and Physical Science*. 2022; 1: 27-31.
80. Saif M, Saad SM, Hassanin FS, Shaltout FA, Marionette Zaghoul: Molecular detection of enterotoxigenic *Staphylococcus aureus* in ready-to-eat beef products. *Benha Veterinary Medical Journal*. 2019; 37: 7-11.
81. Saif M, Saad SM, Hassanin FS, Shaltout FA, Marionette Zaghoul: Prevalence of methicillin-resistant *Staphylococcus aureus* in some ready-to-eat meat products. *Benha Veterinary Medical Journal*. 2019; 37: 12-15.
82. Farag AA, Saad M Saad, Shaltout FA, Mohammed HF: Studies on Pesticides Residues in Fish in Menofia Governorate. *Benha Journal of Applied Sciences*. 2023; 8: 323-330.
83. Farag AA, Saad M Saad, Shaltout FA, Mohammed HF: Organochlorine Residues in Fish in Rural Areas. *Benha Journal of Applied Sciences*. 2023; 8: 331-336.
84. Shaltout FA, Mona N Hussein, Nada Kh Elsayed: Histological Detection of Unauthorized Herbal and Animal Contents in Some Meat Products. *Journal of Advanced Veterinary Research*. 2023; 13: 157-160.
85. Shaltout FA, Heikal GI, Ghanem AM: Mycological quality of some chicken meat cuts in Gharbiya governorate with special reference to *Aspergillus flavus* virulent factors. *benha veteriv medical journal veterinary*. 2022; 42: 12-16.
86. Shaltout FA, Ramadan M Salem, Eman M Eldiasty, Fatma A Diab: Seasonal Impact on the Prevalence of Yeast Contamination of Chicken Meat Products and Edible Giblets. *Journal of Advanced Veterinary Research*. 2022; 12: 641-644.
87. Shaltout FA, Abdelazez Ahmed Helmy Barr, Mohamed Elsayed Abdelaziz: Pathogenic Microorganisms in Meat Products. *Biomedical Journal of Scientific & Technical Research*. 2022; 41: 32836-32843.
88. Shaltout FA, Thabet MG, Koura HA: Impact of Some Essential Oils on the Quality Aspect and Shelf Life of Meat. *J Nutr Food Sci*. 2017; 7: 647.
89. Shaltout FA, Islam Z Mohammed, El -Sayed A: Bacteriological profile of some raw chicken meat cuts in Ismailia city, Egypt. *Benha Veterinary Medical Journal*. 2020; 39: 11-15.
90. Shaltout FA, Islam Z Mohammed, El -Sayed A: Detection of *E. coli* O157 and *Salmonella* species in some raw chicken meat cuts in Ismailia province, Egypt. *Benha Veterinary Medical Journal*. 2020; 39: 101-104.
91. Shaltout FA, EM El-diasty, MA Asmaa- Hassan: HYGIENIC QUALITY OF READY TO EAT COOKED MEAT IN RESTAURANTS AT Cairo. *Journal of Global Biosciences*. 2020; 8: 6627-6641.
92. Shaltout FA, Marrionet Z Nasief, LM Lotfy, Bossi T Gamil: Microbiological status of chicken cuts and its products. *Benha Veterinary Medical Journal*. 2019; 37: 57-63.
93. Shaltout FA: Poultry Meat. *Scholarly Journal of Food and Nutrition*. 2019; 22: 1-2.
94. Shaltout FA: Food Hygiene and Control. *Food Science and Nutrition Technology*. 2019; 4: 1-2.
95. Hassanin FS, Shaltout FA, Seham N Homouda, Safaa M Arakeeb: Natural preservatives in raw chicken meat. *Benha Veterinary Medical Journal*. 2019; 37: 41-45.
96. Hazaa W, Shaltout FA, Mohamed El-Shate: Prevalence of some chemical hazards in some meat products. *Benha Veterinary Medical Journal*. 2019; 37: 32-36.
97. Hazaa W, Shaltout FA, Mohamed El-Shater: Identification of Some Biological Hazards in Some Meat Products. *Benha Veterinary Medical Journal*. 2019; 37: 27-31.
98. Gaafar R, Hassanin FS, Shaltout FA, Marionette Zaghoul: Molecular detection of enterotoxigenic *Staphylococcus aureus* in some ready to eat meat-based sandwiches. *Benha Veterinary Medical Journal*. 2019; 37: 22-26.
99. Gaafar R, Hassanin FS, Shaltout FA, Marionette Zaghoul: Hygienic profile of some ready to eat meat product sandwiches sold in Benha city, Qalubiya Governorate, Egypt. *Benha Veterinary Medical Journal*. 2019; 37: 16-21.
100. Saad SM, Shaltout FA, Nahla A Abou Elroos, Saber B El-nahas: Antimicrobial Effect of Some Essential Oils on Some Pathogenic Bacteria in Minced Meat. *J Food Sci Nutr Res*. 2019; 2: 012-020.
101. Saad SM, Shaltout FA, Nahla A Abou Elroos, Saber B El-nahas: Incidence of *Staphylococci* and *E. coli* in Meat and Some Meat Products. *EC Nutrition*. 2019.
102. Saad SM, Hassanin FS, Shaltout FA, Marionette Z Nassif, Marwa Z: Prevalence of Methicillin-Resistant *Staphylococcus Aureus* in Some Ready-to-Eat Meat Products. *American Journal of Biomedical Science & Research*. 2019; 4: 461-465.
103. Shaltout FA: Pollution of Chicken Meat and Its Products by Heavy Metals. *Research and Reviews on Healthcare: Open Access Journal*. 2019; 4: 3381-3382.
104. Shaltout FA, EM EL-diasty, MSM Mohamed: Effects of chitosan on quality attributes fresh meat slices stored at 4 C. *BENHA VETERINARY MEDICAL JOURNAL*. 2018; 35: 157-168.

105. Shaltout FA, Abdel-Aziz: Salmonella enterica serovar Enteritidis in poultry meat and its epidemiology. *Vet. Med. J. Giza*. 2004; 525: 429-436.
106. Shaltout FA, Hala F El-Shorah, Dina I El Zahaby, Lamiaa M Lotfy: Bacteriological Profile of Chicken Meat Products. *SciFed Food & Dairy Technology Journal*. 2018; 1: 2-3.
107. Shaltout FA, Mohamed AH El-Shater, Wafaa Mohamed Abd El-Aziz: Bacteriological assessment of Street Vended Meat Products sandwiches in Kalyobia Governorate. *BENHA VETERINARY MEDICAL JOURNAL*. 2015; 28: 58-66.
108. Shaltout FA, Mohamed A El Shatter, Heba M Fahim: Studies on Antibiotic Residues in Beef and Effect of Cooking and Freezing on Antibiotic Residues Beef Samples. *Scholarly Journal of Food and Nutrition*. 2019; 2: 1-4.
109. Shaltout FA, Zakaria IM, Nabil ME: Incidence of Some Anaerobic Bacteria Isolated from Chicken Meat Products with Special Reference to Clostridium perfringens. *Nutrition and Food Toxicology*. 2018: 429-438.
110. Shaltout FA, Ahmed A A Maarouf, Mahmoud ES Elkhoully: Bacteriological Evaluation of Frozen Sausage. *Nutrition and Food Toxicology*. 2017; 174-185.
111. Shaltout FA, El-Toukhy EI, Abd El-Hai MM: Molecular Diagnosis of Salmonellae in Frozen Meat and Some Meat Products. *Nutrition and Food Technology Open Access*. 2019; 5: 1-6.
112. Shaltout FA, AM Ali, SM Rashad: Bacterial Contamination of Fast Foods. *Benha Journal of Applied Sciences*. 2016; 1: 45-51.
113. Shaltout FA, Zakaria IM, Jehan Eltanani, Asmaa Elmelegy: Microbiological status of meat and chicken received at university student hostel. *BENHA VETERINARY MEDICAL JOURNAL*. 2015; 29: 187-192.
114. Saad SM, Edris AM, Shaltout FA, Edris Shima: Isolation and identification of salmonellae and E.coli from meat and poultry cuts by using A.multiplex PCR. *Benha Vet. Med.J.special issue*. 2012; 16-26.
115. Saad SM, Shaltout FA: Mycological Evaluation of camel carcasses at Kalyobia Abattoirs. *Vet.Med.J. Giza*. 1998; 46: 223-229.
116. Saad SM, Shaltout FA, Nahla A Abou Elroos, Saber B El-nahas: Antimicrobial Effect of Some Essential Oils on Some Pathogenic Bacteria in Minced Meat. *J Food Sci Nutr Res*. 2019; 2: 012-020.
117. Saad SM, Hassanin FS, Shaltout FA, Marionette Z Nassif, Marwa Z Seif: Prevalence of Methicillin-Resistant Staphylococcus Aureus in Some Ready-to-Eat Meat Products. *American Journal of Biomedical Science & Research*. 2019; 4: 460-464.