

# Just Wanted to Know What Are the Benefits of Detection the Type of Meat Products Originated from Animal Origin

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## Abstract:

Meat is defined as the dressed flesh, of certain animals, consumed as food. Most often this includes the skeletal muscles and associated fat and other tissues along with edible organs and offal. Meat and meat products have a great significance in human nutrition and thus for maintenance of consumer health. Meat is very rich source of proteins, containing all the essential amino acids. Detection of species fraud in meat products is important for consumer protection and food industries. As meat and meat products represent an important and large component of human food, their quality is of concern to the consumers, the regulatory authorities, the processors and the retailers. The higher demand for meat and meat products accompanied by their escalating cost makes them prone to fraudulent adulteration, substitution and mislabelling. Adulteration literally means debasing something or rendering it impure by mixing it with some inferior or harmful substance. The determination of food authenticity and the detection of adulteration are major issues in the meat industry and are attracting increasing amount of attention. Identification of the species of origin in meat samples can be done using physical method, DNA based techniques and spectrophotometry method.

**Key words:** meat product; types identity; dna markers; physical method

## Introduction

Fraudulent adulteration of costly meat with cheap meat is a common practice observed throughout the world. The ability to detect less desirable or objectionable species in meat products is important not only for economic, health, religious, and ethical reasons; but also, to ensure fair trade and compliance with legislation. Authenticity testing of the animal species present in food is important for economic, safety, legal, religious and health reasons (1-7). Product consumption containing non declared meat proteins can induce allergic reactions in predisposed individuals. Customers are gaining interest to know the origin of the foods because of quality related reasons, health and safety reasons and concerns about animal welfare. Due to some cost and religion concerns the meat producers have to comply with some rules issued by the legal institutions (8-15). Hence, it is an important task for food control laboratories to be able to carry out species differentiation of raw materials to be used for industrial food preparation and the detection of animal species in food products.

Available methods used to identify different species are electrophoresis, liquid chromatography, dot blot hybridization, randomly amplified polymorphic DNA PCR, RFLP analysis, and species-specific PCR. However, molecular techniques are considered as reliable methods to identify meat types since there is a need to develop faster, cheaper and

safe methods [16-22]. Besides histological tests, immunoassays or DNA analysis, spectroscopic techniques are gaining interest due to being low cost and easily applied. The power of the spectroscopy comes from giving chance to detect or quantify physical, chemical and biological attributes of the samples based on their spectral signature, and imaging transforms this information into chemical maps for spatial visualization. Thus, these methods can be used to determine what attributes, how much and where they are located in the sample [23-29]. **DNA Based Methods to Identify the Meat Types**, Today, many consumers are concerned about the meat they eat and accurate labelling is important to inform consumer choice. The choice one product over another can reflect aspects of lifestyle (e.g. vegetarianism and organic food), religion (e.g. absence of pork from some diets), diet and health concerns (e.g. absence of allergens) [30-36]. In addition, accurate labelling is important to support fair-trade. Additional descriptive label information can be added as a consequence of branding, product marketing purposes and regulations [37-43]. False or inadvertent mislabeling of meat products, which cannot be distinguished using conventional strategies is still predominant over the world. Some individuals may not like to consume the meat of equine and pork due to ethical, religious, or compassionate reasons. So, these clusters of consumers demand methods to detect types of meat (equine, pork, chicken, and mouse) in the food [44-50]. The Meat adulteration and

quality assurance of meat and meat products are very important for human health protection. For detection of adulteration of meat and meat products by unauthorized plant food additives and low-priced, illegal, or decomposed animal tissues, lung, heart, connective tissue, smooth muscles, cartilage, and plant tissues [51-57]. Consumption of adulterated food contributes to numerous diseases in society, ranging from mild to life threatening. Therefore, detection of adulteration in food is essential to ensure the safety of the food we consume [58-64]. Meat species adulteration is a worldwide problem which violates food labeling laws. Thus, determination of the species of the meat components in meat products is an essential task in food hygiene, meat adulteration in ground and comminuted products has been a widespread problem in retail markets [65-71]. In the Egyptian markets, the addition of an undeclared meat species (such as chicken in beef products) and/or unacceptable meat type (pork and donkey or the replacement of one valuable species by another inexpensive one) are common examples of meat adulteration [72-78]. Away from price, religious customs are one of the distinguished subjects that should be considered. For example, it is forbidden for Muslims to consume the flesh of pork and its derivatives. Something else, some permitted meat is not alluring for Egyptian customers, as donkey and horse meat, that may be sold without any offered costs, and thus there's a critical chance of blending them in Egyptian nourishments [79-85]. The species of meat used in prepared, cooked, or compounded blends is not continually plausible to be distinguished by schedule examination. However, denaturation of meat proteins during heat treatment or any other technological processes and variation of protein compositions, even in the same species, reduce the chance of success for these methods. Besides, these strategies may be insufficient to segregate between species which are in near connection and are not reasonable for schedule utilize, as the confinement of species-specific proteins is troublesome and time-expending [86-92]. Adulteration of meat and its products is a dangerous and worldwide problem which violates food labeling laws so, must apply reliable and scientifically accepted tests for detecting that adulteration. Actually, applications of PCR technique were reliable, easier, faster and relatively stable for detection of meat adulteration compared with other trials [93-99].

**Most Common Types of Food Adulteration, biological Adulteration,** Substituting one type of meat with another, such as mixing beef with horse or dog meat. Selling meat from sick or dead animals instead of fresh, healthy meat. Mixing meat with non-meat components such as fat or ground animal skin [114-120]. **Chemical Adulteration,** adding unauthorized preservatives like formalin or nitrites to extend shelf life. Injecting meat with water, salt, or phosphates to increase weight and enhance appearance. Adulteration with adding preservatives like boric acid, sulphur salts and others with the aim of delaying or concealing the spoilage of meat and giving the meat colour Bright and appears fresh. Using artificial dyes to make the meat appear fresher [121-127]. **physical adulteration,** adding water or ice to increase its weight. using fillers as starch or flour to increase volume. adding non-meat tissues like bones, cartilages or connective tissue. adding foreign materials like metal, glass or plastic. using texturized protein like plant proteins increase volume and reduce costs [128-134].

**Methods for the identification of meats,** Anatomical, Colour, texture, odour, structure of bones, flesh and fat. Physical, Refractive index of fat, iodine value. Chemical, Glycogen content, lenolenic acid content. Biochemical: Iso-electric focusing (IEF), SDS-PAGE technique. Immunological: Agar gel precipitation test (AGPT), Counterimmuno electrophoresis (CIEP), Agarose gel electrophoresis (AGE), Enzyme linked immunosorbant assay (ELISA), Peroxidase anti-peroxidase technique (PAP), Radioimmuno assay (RIA), Starch agarose

electrophoresis. Novel methods: DNA analysis, DNA based techniques such as polymerase chain reaction (PCR) and gene probes [135-141]. **Anatomical methods,** Species of meat can be differentiated on the basis on anatomical peculiarities. **Colour, texture and odour of flesh,** Buffalo meat is darker and coarse when compared to cattle meat. Chevon has typical goaty odour especially in males. **Osseous tissue like bones or cartilage,** Bones or cartilages when present along with the meat can be used for species differentiation based on the anatomical peculiarities of the specific bones. Poultry meat can be identified from other species owing to smaller and soft nature of the bones. **Colour, consistency and distribution of fat,** Cattle fat is yellowish in colour while buffalo fat is creamy white. Fat in pigs is present subcutaneously and in abundant quantity but is not intermixed with flesh, whereas cattle/buffalo fat is uniformly distributed with muscle tissues termed as marbling. **Physical methods- Meat speciation,** based on certain physical parameters is sometimes followed in absence of specific anatomical differences. **In physical techniques,** general appearance for detection of different meat species is taken into consideration. It is a combined perception of colour, texture, odour and presence of other body parts along with meat. One of the most important sensory qualities tested in meat is the appearance Texture and freshness, colour, Taste, smell, flavour, and juiciness. It gives the primary idea about the meat species on the basis of quality characteristics of meat and fat. Each type of meat has a special colour as Cows meat is bright red and yellow fat, Buffalo's meat is dark red and the fat is white, Goats and sheep meat hair tends to stick to it, Donkeys meat is dark red to dark bluish brown, bad smell, its fibres are prominent, a little fat with a copper colour and a greasy consistency. Physical methods of adulteration detection including microscopic and macroscopic visual structural assessments, as well as analysis of physical parameters such as morphological characteristics, structure, solubility, and bulk density, have been designed but these methods do not guarantee qualitative adulterant detection. Visual structural analysis by macroscopic and microscopic methods is very valuable for identifying microbes as harmful types, especially fungi. Adulteration can be detected by sampling a small amount on a glass plate and visually examining impurities because clean foods do not contain such impurities [142-148]. **The differentiation between lambs and goats' meat through carcass identification,** selling female meat as male meat, also by sewing, selling fatal meat as veal meat, one of the types of veal or beef meat or young buffalo, which feed only on milk; As the average age to obtain veal meat, The flesh of the foetus is saturated with water, pale in colour, and contains a high percentage of glycogen. Selling the meat of lean animals after slaughtering them without medical treatment, Inflating the carcass to make the consumer think that it is full of meat, sell pastrami before it dries, the moisture content must not exceed %40, Selling cat meat as rabbit meat. Injecting chicken meat with water with syringes to increase weight and freeze it, imported canned meat made from unhealthy meat as madness Cows, spoiled meat, containing entrails, heads, or appendages, Meat not fit for human consumption, Forgery of the declaration label on packages by changing the country of origin [149-155]. **The Pre-cooking tests of meat,** Heating the knife and then cutting the meat produce bad smell it is invalid, to find out the meat of dead animals the meat is very tough, and we put a piece of meat in water, if it is contaminated with blood indicate it is from dead animal. **The tests while cooking of meat,** when donkey meat is immersed in water, yellow oily spots appear. The texture of boiled meat is rough plus a sweet taste. **Measurement of refractive index of fat,** Fat is liquefied and refractive index of oil is measured by refractometer. R.I. values of some animals are: horse 53.5, cattle not above 40 and pig not above 51.9. **Estimation of iodine value-** This test measures the amount of iodine absorbed by unsaturated fatty acids present in the fat and varies in different animals. Iodine value of fat in loin is 71

to 86, in cattle 38 to 46, in sheep 35 to 46 and in pig it is 50 to 70.

**Chemical methods,** Chemical methods are used to detect the presence or absence of a particular chemical constituent and/or its quantity in meat. The tests, however, have not gained popularity since the chemicals are not species specific and cannot differentiate between the chemical agents with similar reactivity. Besides, the methods are time consuming and exhaustive (156-161).

**Some of the chemical methods used are**

**Glycogen content,** Horse flesh has higher glycogen content than other animals, but when horse is exhausted and glycogen is depleted, it may lead to misinterpret of the results.

**Lenolenic acid,** Horse fat contains about 1-2% lenolenic acid, in other animals it is not present in proportions higher than 0.1%. make moisture analysis to detect added water or ice make, Protein analysis to detect added fillers or non- meat tissues. Measure decomposition of meat components by microbes, autolysis enzymes, or because of chemical reactions such as fat rancidity, Chemical compounds, Total reduced volatiles, Estimation of the indole number, Determination of ammonia and Fat rancidity test.

**The Ehrlich test of meat,** add formalin to a piece of meat after one day if it appears, a distinctive smell like that of a roasted goose. The meat is donkey meat.

**Biochemical methods,** Electrophoresis of meat/ organ extract or any other biological material results in separation of various proteins when migrate on the suitable medium under the influence of an electrical field. These separated protein fractions are species specific and thus help in identifying origin of biological materials [160-166].

**Iso-electric focusing (IEF),** Proteins are low or high molecular weight compounds either acidic or alkaline in reaction and negatively charged substances. Besides, they have a specific pH at which their overall electric charge becomes zero and they get precipitated. This precipitation point is termed as iso-electric point (PI). A suitable pH gradient is formed on the polyacrylamide or agarose gel with the help of amphoteric buffers (ampholytes) having specific pH range such as 3-9, 5-8 etc. When muscleproteins migrate on polyacrylamide or agarose gel having ampholyte bed under strong electric field, they precipitate at respective PI points forming a precipitation band on the gel. The precipitation band/bands of proteins are detected by staining and/or by densitometric scanning. The number of bands, their distribution pattern and isoelectric (PI) point at which they are precipitated are very specific to a species of animal which helps in identifying the species origin of meat even in mixtures. This technique can be used for identification of species of animal using many biological materials like blood, serum, milk, meat, organs, serum etc. The results specific, reliable and can be reproduced [153-159].

**SDS-PAGE technique,** the overall charge on the proteins becomes zero when treated with detergents like sodium dodecyl sulphate (SDS) due to denaturation. While migrating on suitable medium like polyacrylamide gel (PAGE), agarose gel etc. having a corresponding pore size such proteins precipitate on the basis of the molecular weights forming the characteristic bands. Staining and densitometric scanning of such bands provides an indication about the species of animal as the banding patterns of tissues from different animals vary. Identification of species is based on the molecular weight of proteins and not on the basis of their PI points as in IEF. Isoelectric focussing and SDS-PAGE technique enable differentiation of raw and partially heated (cooked) meats. Besides, it has been reported that the results vary from laboratory to laboratory, and person to person. In boiled or cooked meats, the bands produced are diffused, non-reproducible and difficult to decipher. As such the technique is not of much use in differentiation of cooked/processed meats [107-113].

**Immunological/serological methods,** on introduction in body, foreign proteins (antigen) stimulate the host immune system to generate antibodies which can be demonstrated in its serum. In vitro combination of the antigen and antibody results in a variety of reactions such as flocculation, precipitation, agglutination, cytolysis and neutralisation.

The response is very specific to the antigen or antibody types involved as the reactions occur only between homologous antigen and antibody. The principle is employed for species identification of variety of biological materials such as milk, meat, organs, semen etc. In meat speciation, raw meat extract is commonly used as antigen for antibody formation in a suitable animal like rabbit or sheep. Though the antibodies can be used for species identification of raw meats, their greatest drawback is the occurrence of cross reactions with similar proteins which makes differentiation of phylogenetically related species (e.g. sheep and goat) difficult. Also, cooked meat is not identifiable. However, these limitations have been managed with the development of antibodies to heat stable antigens from adrenal glands. Use of adrenal glands for antibody production has been advocated as they have two antigenic fractions, one adrenal specific and another present in other organs, blood and skeletal muscles. This widely distributed antigen is found to be species specific. Because of their resistance to boiling temperature and ethanol perceptibility, these are widely known as BE antigens, wherein B stands for resistance to boiling temperature and E for ethanol perceptibility the antisera can be developed either in rabbits or sheep, and cross-reacting antibodies can be removed by immunoadsorption to make them species specific. These mono specific antisera are useful for identification of tissues, organs, biological fluids (urine, milk, semen, etc.), semi cooked and cooked meats, and processed meat products employing various immunological techniques [133-139].

**Novel methods, Chromatography based,** Chromatography is a sensitive technique used to separate, identify, and purify small molecules in a mixture, such as fatty acids, carbohydrates, and amino acids, for qualitative and quantitative analyses. Chromatographic methods are the most common priority for assessing the authenticity of most foods. This is partly because techniques such as chromatography can be used both to detect adulterants and as a motive to determine authenticity. Modern analytical methods like high-performance liquid chromatography, gas chromatography–mass spectrometry, etc. can accurately identify the types and concentrations of different types of food degrading agents. gas chromatography is often used for the separation of different types of unseparated products, for adulteration detection, and for the authentication and identification of organic substances. Chromatography combined with mass spectroscopy (MS) and Fourier transform infrared spectroscopy (FTIR) has been widely used for the detection of harmful materials in food [122-128].

**Spectroscopy based,** Defined spectroscopy as the study of the absorption, transmission, and emission of light and other radiations of matter and their dependence on the wavelength of the radiation. Spectroscopic techniques like near-infrared (NIR), mid-infrared (MIR), and Raman spectroscopy have been widely and successfully used as sensitive and fast analytical techniques for detecting food adulteration. These techniques have the advantage of being nondestructive and having a relatively low analysis cost. The Fourier transform infrared (FTIR) based on mid-infrared (MIR) spectroscopy is one of the most commonly used spectroscopic technique for food fraud currently used by both industry and government laboratories. Infrared Spectroscopy (FT-IR) have been taken into consideration due to the need for new and rapid analytical methods in the field of food adulteration. These methods are generally based on transmittance or reflectance readings, and they require none or very little sample pre-treatment. Infrared (IR) spectroscopy as a well-accepted analytical technique because it is environment-friendly and does not need complicated sample preparation procedure. The power of the spectroscopy comes from giving chance to detect or quantify physical, chemical and biological attributes of the samples based on their spectral signature, and imaging transforms this information into chemical maps for spatial visualization. Thus, these methods can be used to determine what attributes, how much and where they are located in the sample [66-

72]. **Molecular technique**, Nowadays, DNA is preferred for species identification due to its great constancy, compared to proteins. Applications of polymerase chain reaction (PCR) have been augmented because of their easiness, speed, and specificity. Multiplex PCR is an effective technique that can instantaneously amplify the template mix, diminish the recognition charge, and eliminate the failure of single PCR of detecting only one meat species at a time. Moreover, it investigated the application of a novel multiplex PCR (M-PCR) as a sensitive and specific method to detect adulteration in meat products sold in different supermarkets in Cairo, Egypt with equine, pig, chicken, and mouse meat. The PCR was applied to identify six meat (cattle, pig, chicken, sheep, goat and horse) as raw materials for products. By mixing seven primers in appropriate ratios, species-specific DNA fragments could be identified by only one multiplex PCR. Application of PCR for identification of *cyt b* genes for differentiation of meats of different animal species was performed essentially by using primers. It was noticed that the sensitivity and accuracy of PCR in detection of species of meat and its adulteration greatly overcome potency of AGID test as PCR depends on the detection of the specific DNA molecules which is a relatively stable allowing analysis of processed and heat-treated food products. Failure of AGID to detect species adulteration may be attributed to addition of spices, salts and another ingredient. Species identification in heat processed products is hindered by progressive denaturation of the protein markers, leading to loss of solubility and antigenicity. The information suggests that PCR-RFLP are useful tools for detecting food adulteration, depending on the processed food chosen, and will help to protect consumers' rights by enabling the enforcement of labelling regulations in a country, so we recommend continuous screening of meat products for adulteration in local markets and restaurants should be applied under veterinary authority. Similar issue should be done for imported meat and meat products. Education of consumers is the keystone of the effective control of meat adulteration. Then consumers should purchase their requirement of meat and meat products from known trusted shops and restaurants. DNA analysis is now a famous approach for meat species identification. Nowadays, DNA is preferred for species identification due to its great constancy, compared to proteins. Applications of polymerase chain reaction (PCR) have been augmented because of their easiness, speed, and specificity. Multiplex PCR is an effective technique that can instantaneously amplify the template mix, diminish the recognition charge, and eliminate the failure of single PCR of detecting only one meat species at a time. DNA based techniques such as gene probes and polymerase chain reaction (PCR) can be used for speciation of meat. Complementary DNA or RNA strands can be used for the detection of DNA or RNA of suspected species by nucleic acid hybridization technique. A specific nucleic acid sequence can be exponentially amplified in vitro in PCR resulting in large quantity of DNA sequence. Selected primers are used for amplification of searched genetic material and the amplicons can be detected by gel electrophoresis or detection methods antibody. Identification of the species of origin in meat samples can be done using physical method, DNA based techniques and spectrophotometry method. Current available methods used to identify different species are electrophoresis, liquid chromatography, dot blot hybridization, randomly amplified polymorphic DNA PCR, RFLP analysis, and species-specific PCR. However, molecular techniques are considered as reliable methods to identify meat types since there is a need to develop faster, cheaper and safe methods. Besides histological tests, immunoassays or DNA analysis, spectroscopic techniques are gaining interest due to being low cost and easily applied [38-44]. **DNA Based Methods** to Identify the Meat Types Meat and meat products are very susceptible to spoilage and also expensive as compared to other food types. Among the techniques used for species identification, PCR is a

DNA based technique allowing the detection of very low amounts of nucleic acid probes and the determination of their sequence via the amplification of DNA or RNA individual strains. This method has some advantages such as high sensitivity and rapid performance with high sample numbers. DNA-based techniques frequently used for meat species identification include DNA barcoding, DNA hybridization, and sequence analysis and PCR-based techniques include randomly amplified polymorphic DNA (PCR-RAPD), restriction fragment length polymorphism (PCR-RFLP), PCR with species-specific primers, real-time PCR and PCR-nucleotide sequencing. Among DNA based methods, polymerase chain reaction (PCR) is the most well developed molecular technique up to now and provides a simple, rapid, highly sensitive and specific tool for detecting constituents of animal origin in foods. A primary aspect of successfully detecting a species by PCR is to choose adequate genetic markers to develop the assay. Both nuclear and mitochondrial genes have been targeted for the identification of meat fraud. In addition, the use of PCR in food analysis has provided various analytical methods for rapid detection and identification at species and intra-species levels; however, DNA-based methods still face some important limitations, especially for quantitative measurements of food composition. To keep things simple, the molecular methods for identifying meat species and meat products are divided into three categories: PCR, DNA barcoding, and DNA hybridization [99-105]. **Species-specific PCR for meat species identification**, A PCR assay is used to validate the meat types and to check crosscontamination against the product and ingredient classification, using mitochondrial species-specific markers. At present, the PCR technique using species-specific primers is one of the genetic methods that allow novel identification of different meat species, both raw meats and meats subjected to thermal treatments. This technique is a precise, sensitive, cheap, and less time-consuming method that helps the novel identification of many mammalian and bird species in meat and meat products as compared to other PCR-based assays. **DNA Barcoding**, puts forward the use of a sequence from a single genomic region (defined as barcode), as the base of a recognition system capable to identify all animal species. This biomolecular methodology consists in the identification of the belonging species through the sequencing of a fragment of mitochondrial genes, its alignment and comparison with the information available on the databases. **RAPD (Random Amplified Polymorphic DNA)** is a very fast, easy to perform, and does not require expensive equipment method. In this method, PCR allow the examination of genomic variation without prior knowledge of DNA sequences. **PCR** can be used to identify the meat species and produce good fingerprints from processed products in which DNA has been only slightly degraded, such as smoked or salted products. RAPD is a modified PCR technique in which DNA fragments are generated in a very short period of time which can be visualized in a gel electrophoresis. In this technique DNA extraction is the first step, then it is amplified with specific primer. It is followed by denaturation of strand at 94°C for 1min, the primer annealing at 47°C for 1min. Then extension of primer is done at 72°C for 1min. Electrophoresis (10µL portion of amplification) is carried out at at 100V in a 3% agarose gel [100-106].

## Conclusion

**The adulteration of meat and meat products**, it has a harmful effect on health, Hides the smell of rotting meat, it hides the true colour of raw meat, adding nicotinic acid compounds (one of the elements of a group) Vitamin B garage) or sodium nicotinate to meat Preserved to maintaining the desired red colour of meat for the consumer. Eating a large amount of these compounds leads to symptoms that appear Pathology in humans as flushing of the face and neck with itching, nausea, Sweating and abdominal cramping. Selling meat from animals infected with diseases

This is done by slaughtering sick animals outside approved state slaughterhouses indicates It is recommended to avoid buying meat without seals and Selling goat meat as lamb by sewing a lamb into the back of the goat.

### Conflicts of Interest

The author declares no conflicts of interest.

### References:

- 1- 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.
- 2- Shaltout, F.A., Riad,E.M., and Asmaa Abou-Elhassan (2017): Prevalence of Mycobacterium Sepp. In Cattle Meat and Offal's Slaughtered in and Out Abattoir. Egyptian Veterinary medical Association, 77(2): 407 – 420.
- 3- **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.
- 4- 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.
- 5- 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.
- 6- 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.
- 7- 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.
- 8- Edris, A., Hassan,M.A., Shaltout,F.A. and Hosseini, S (2013): Chemical evaluation of cattle and camel meat.BENHA VETERINARY MEDICAL JOURNAL, 24(2): 191-197.
- 9- 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.
- 10- 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
- 11- 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.
- 12- 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.
- 13- Edris, A.M.; Shaltout, F.A. and Arab, W.S. (2005): Bacterial Evaluation of Quail Meat. Benha Vet. Med.J.16 (1):1-14.
- 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 25-27<sup>th</sup> May 2011Veterinary Medicine and Food Safety) 172-179 benha, Egypt.
- 15- 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.
- 16- 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 25-27<sup>th</sup> May 2011Veterinary Medicine and Food Safety )194-201 benha , Egypt.
- 17- 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 JOURNAL41(2): 38-40.
- 18- 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.
- 19- 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.
- 20- Hassan M, Shaltout FA\* and Saqur N (2020): Histamine in Some Fish Products. Archives of Animal Husbandry & Dairy Science 2(1): 1-3.
- 21- 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.
- 22- 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.
- 23- Hassan, M. A; Shaltout, F.A.; Maarouf, A.A. and El-Shafei, W.S. (2014): Psychrotrophic bacteria in frozen fish with special reference to pseudomonas species. Benha Vet. Med.J.27 (1):78-83.
- 24- 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.
- 25- 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- Shaltout, F. A. (2024). Egyptian Medicinal Plants and Respiratory Disease.Journal of Agriculture and Education Research. 2 (3), 1-7.
- 27- 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.

- 28- 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.
- 29- Hassanin, F. S; Shaltout,F.A. and, Mostafa E.M(2013): Parasitic affections in edible offal. *Benha Vet. Med.J.25* (2):34-39.
- 30- 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.
- 31- Shaltout FA. Dry-Aged Meat and their Importance. *Open J of Frail Sci* 2024, 2(1): 000111. DOI: 10.23880/oajfs-16000111
- 32- Khattab, E.,Fahim Shaltout and Islam Sabik (2021): Hepatitis A virus related to foods. *BENHA VETERINARY MEDICAL JOURNAL* 40(1): 174-179.
- 33- Shaltout, F. A. Human Parasites in Relation to Contaminated Food and Drinking Water. *J Biomed Sci Biotech Res.* 2024. 2(1): 1-5. DOI: doi.org/10.61440/JBSBR. 2024.v2.02
- 34- 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.
- 35- Shaltout FAE. Everything about Nutritional Value of the Meat Ingredients and How we can Reduce its Microbial Hazards. *J Vet Sci Res* 2025, 10(1): 000283. DOI: 10.23880/oajvsr-16000283
- 36- Saif,M. , Saad S.M., Hassanin, F. S; Shaltout FA, Marionette Zaghoul (2019): Molecular detection of enterotoxigenic *Staphylococcus aureus* in ready-to-eat beef products. *Benha Veterinary Medical Journal* 37 (2019) 7-11.
- 37- Saif,M. , Saad S.M., Hassanin, F. S; *Shaltout, F.A.*, Marionette Zaghoul (2019); Prevalence of methicillin-resistant *Staphylococcus aureus* in some ready-to-eat meat products. *Benha Veterinary Medical Journal* 37 (2019) 12-15.
- 38- Farag, A. A., Saad M. Saad<sup>1</sup>, Fahim A. Shaltout<sup>1</sup>, Hashim F. Mohammed (2023 a): Studies on Pesticides Residues in Fish in Menofia Governorate. *Benha Journal of Applied Sciences*, 8(5): 323-330.
- 39- Shaltout, F. A. (2024): The concept of meat analysis in economy and public health, Dietary Nourishment and Food Processing Techniques (DNFPT) 1(1) 1-7, DOI: 10.1875/dnfpt.2024/001
- 40- Farag, A. A., Saad M. Saad<sup>1</sup>, Fahim A. Shaltout<sup>1</sup>, Hashim F. Mohammed (2023 b): Organochlorine Residues in Fish in Rural Areas. *Benha Journal of Applied Sciences*, 8 (5): 331-336.
- 41- *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.
- 42- 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 veterir medical journal veterinary* 42(1): 12-16.
- 43- *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.
- 44- *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.
- 45- 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.
- 46- *Shaltout, F.A.*, Islam Z. Mohammed<sup>2</sup>, 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.
- 47- *Shaltout, F.A.*,Islam, Z. Mohammed<sup>2</sup>, 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.
- 48- *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.
- 49- *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.
- 50- *Shaltout, F.A.* (2019): Poultry Meat. *Scholarly Journal of Food and Nutrition* 22 1-2.
- 51- *Shaltout, F.A.* (2019): Food Hygiene and Control. *Food Science and Nutrition Technology* 4(5): 1-2.
- 52- 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.
- 53- Shaltout, D. E. (2024): Additives Extend the Food Shelf Life by Addition of Preservatives Nitrate, and Nitrite to Food, Dietary Nourishment and Food Processing Techniques, 1(3): 1-12. DOI: 10.9567/3064-7061/WSJ.83
- 54- 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.
- 55- Shaltout, F. A. E. (2024): Using of Meat Diets as a Functional Food, Dietary Nourishment and Food Processing Techniques, vol 1(3): 1-14
- 56- Shaltout, F. A. (2024) Evaluation of Hazards in food, *Journal of Medical Discoveries*, 1(1);1-8 DOI:
- 57- 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.
- 58- Shaltout, F. A.(2024): Through a light on Meat as Functional food, *International Journal of Nursing Didactics*, 14 (08): 1-12.

- 59- 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.
- 60- Shaltout F. (2019) Microbial Contamination of Beef and Beef Products. *J. Nutrition and Food Processing*, 2(2): 1; Doi:10.31579/2637-8914/014
- 61- 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.
- 62- Shaltout. F. A. (2024): Abattoir and Bovine Tuberculosis as a Reemerging Foodborne Disease. *Biomed J Sci & Tech Res* 54(3)-2024. BJSTR. MS.ID.008545.
- 63- 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.
- 64- Shaltout, F. A. E. (2024): Good News about Application of Advanced Methods in Food Examination, Dietary Nourishment and Food Processing Techniques, vol 1(3): 1-9. DOI: 10.9567/3064-7061/WSJ.110.
- 65- 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).
- 66- Shaltout, F. A. E. (2024): Our options to improve food safety and quality by using preservatives which are used in food processing and preservation, Dietary Nourishment and Food Processing Techniques, vol 1(3): 1-16. DOI: 10.9567/3064-7061/WSJ.95.
- 67- 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.
- 68- 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).
- 69- 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.
- 70- Shaltout and Abdel-Aziz, 2004: *Salmonella enterica* serovar Enteritidis in poultry meat and their epidemiology. *Vet. Med. J. Giza*, 52 (2004), pp. 429-436.
- 71- 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.
- 72- *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,
- 73- *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
- 74- 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.
- 75- Shaltout FA, Ahmed A A Maarouf and Mahmoud ES Elkhoully. (2017): Bacteriological Evaluation of Frozen Sausage. *Nutrition and Food Toxicology* 1.5; 174-185.
- 76- 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.
- 77- *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.
- 78- *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.
- 79- Saad,S.M.;Edris, A.M.; Shaltout,F.A. and Edris, Shimaa (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.
- 80- Saad, S.M. and Shaltout, F.A. (1998): Mycological Evaluation of camel carcasses at Kalyobia Abattoirs. *Vet.Med.J. Giza*,46(3):223-229.
- 81- Shaltout, F. A. (2024): Why We Extend the Food Shelf Life by Aid of Natural Antioxidants? *Biomed J Sci & Tech Res* 59(1)-2024. BJSTR. MS.ID.009235
- 82- 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.
- 83- 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.
- 84- 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).
- 85- 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.
- 86- 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.
- 87- 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. *1rst Ann. Confr. FVM., Moshtohor, Sept, 2004.*

- 88- Shaltout FA, El-diasty, E, M.; Elmesalamy, 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.
- 89- Shaltout, F.A. (2002): Microbiological Aspects of Semi-cooked chicken Meat Products. Benha Veterinary Medical Journal 13, 2, 15-26.
- 90- 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.
- 91- 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.
- 92- 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.
- 93- 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.
- 94- Shaltout, F.A. (1996): Mycological and Mycotoxicological profile of Some Meat products. Ph.D.Thesis, Faculty of Veterinary Medicine, Moshtohor, Zagazig University Benha branch.
- 95- Shaltout, F.A. (1998): Proteolytic Psychrotrophes in Some Meat products. Alex. Vet. Med. J.14 (2):97-107.
- 96- Shaltout, F.A. (1999): Anaerobic Bacteria in Vacuum Packed Meat Products. Benha Vet. Med.J.10 (1):1-10.
- 97- Shaltout, F.A. (2000): Protozoal Foodborne Pathogens in some Meat Products. Assiut Vet. Med. J. 42 (84):54-59.
- 98- Shaltout, F.A. (2001): Quality evaluation of sheep carcasses slaughtered at Kalyobia abattoirs. Assiut Veterinary Medical Journal, 46(91):150-159.
- 99- Shaltout, F.A. (2002): Microbiological Aspects of Semi-cooked Chicken Meat Products. Benha Vet. Med.J. 13(2):15-26.
- 100- Shaltout, F.A. (2003): *Yersinia Enterocolitica* in some meat products and fish marketed at Benha city. The Third international conference Mansoura 29-30 April.
- 101- Shaltout, F.A. (2009): Microbiological quality of chicken carcasses at modern Poultry plant. The 3<sup>rd</sup> Scientific Conference, Faculty of Vet. Med., Benha University, 1-3 january.
- 102- 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.
- 103- Shaltout, F.A. and Abdel Aziz, A.M. (2004): ESCHERICHIA COLI STRAINS IN SLAUGHTERED ANIMALS AND THEIR PUBLIC HEALTH IMPORTANCE. J.Egypt. Vet. Med. Association 64(2):7-21.
- 104- 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.
- 105- Shaltout, F.A. and Afify, Jehan Riad, EM and Abo Elhassan, Asmaa, A. (2012): Improvement of microbiological status of oriental sausage. Journal of Egyptian Veterinary Medical Association 72(2):157-167.
- 106- Shaltout, F.A. and Daoud, J. R. (1996): Chemical analytical studies on rabbit meat and liver. Benha Vet. Med.J.8 (2):17-27.
- 107- Shaltout, F.A. and Edris, A.M. (1999): Contamination of shawerma with pathogenic yeasts. Assiut Veterinary Medical Journal, 40(64):34-39.
- 108- Shaltout, F. A.; Eldest, 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.
- 109- 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.
- 110- 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.
- 111- Shaltout, F. A.; El Shater, M. and Wafaa, Abdelaziz (2015): Bacteriological assessment of street vended meat products sandwiches in Kalyobia Governorate. Benha Vet. Med.J.28 (2):58-66.
- 112- 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
- 113- Shaltout, F.A.; Ghoneim, A.M.; Essmail, M.E. and Yousefi, A. (2001): Studies on aflatoxin B1 residues in rabbits and their pathological effects. J.Egypt. Vet. Med. Association 61(2):85-103.
- 114- Shaltout, F.A. and Hanan, M.T. El-Lawendy (2003): Heavy Metal Residues in Shawerma. Beni-Suef Vet. Med.J. 13(1):213-224.
- 115- Shaltout, F.A. and Hashim, M.F. (2002): Histamine in salted, Smoked and Canned Fish products. Benha Vet. Med.J.13 (1):1-11.
- 116- 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.
- 117- Shaltout, F.A. and Ibrahim, H.M. (1997): Quality evaluation of luncheon and Alexandrian sausage. Benha Vet. Med.J.10 (1):1-10.
- 118- 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.
- 119- Shaltout, F.A., Amani M. Salem, A. H. Mahmoud, K. A (2013): Bacterial aspect of cooked meat and offal at street vendor's level. Benha veterinary medical journal, 24(1): 320-328.

- 120- Shaltout, F.A. and Salem, R.M. (2000): Molds, aflatoxin B1 and Ochratoxin A in Frozen Livers and meat products. *Vet. Med. J.Giza* 48(3):341-346.
- 121- 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
- 122- 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.
- 123- 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.
- 124- Shaltout, F. A.; El-diasty, E.M.; Salem, R. M. and Asmaa, M. A. Hassan. 2016: Mycological quality of chicken carcasses and extending shelf -life by using preservatives at refrigerated storage. *Veterinary Medical Journal – Giza* ,62(3) :1-10.
- 125- 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,
- 126- Shaltout FA, El-diasty, E, M.; Elmesalamy, 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*
- 127- 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.
- 128- 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.
- 129- 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.
- 130- 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) 88-92.
- 131- Shaltout, F. A. (2024): Good Idea on Preservatives and the Natural Preservatives and Meat Preservation Against the Foodborne Pathogens and the Spoilage Microorganisms. *Biomed J Sci & Tech Res* 57(5)-2024.
- 132- 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.
- 133- Shaltout, F.A. (2024): Abattoir and Bovine Tuberculosis as A Reemerging Foodborne Diseases. *Clinical Medical Reviews and Report* 6(1):1-7.
- 134- Shaltout, F.A. (2023): Viruses in Beef, Mutton, Chevon, Venison, Fish and Poultry Meat Products. *Food Science & Nutrition Technology* 8(4):1-10.
- 135- Shaltout, F. A. (2024): Human Salmonellosis Acquired through the Food". *Acta Scientifc Pharmaceutical Sciences* 8. (3): 1-6: 12-17
- 136- Elkholy, R. A; Hussein, M. N; Abou El-Roos, N. A. and Shaltout, F.A.E. (2025) Enhancing Microbiological and Histological Quality of Frozen Turkey Meat Using Vinegar. *Egyptian Journal of Veterinary Sciences*pp 1-8.
- 137- Shaltout, F. A. (2024): Availability, Price, Tradition, Religion, Income, Social, Development and Economic Influences on Meat Consumption. *Med J Clin Trials Case Stud* 2024, 8(2): 000370
- 138- Mohamed Q. M., Fahim A. Shaltout, f.A. and Ali, E.A. (2025): Multidrug-Resistant Bacteria from Raw Chevon and Mutton Meat . *Egyptian Journal of Veterinary Sciences* pp 1-8.
- 139- Shaltout, F. A. E; Ab delazez Ahmed Helmy Barr, Mohamed Elasleyed Abdelaziz. (2024): Pathogenic Microorganisms in Meat Products. *Biomed J Sci & Tech Res* 41(4)-2022.
- 140- Mohamed Q. M., Fahim A. Shaltout, f.A. and Ali, E.A. (2025): Bacteriological Quality Profiles and Prevalence of Staphylococcus aureus, Salmonella Species, and E. coli in Meat Samples of Sheep and Goats. *Egyptian Journal of Veterinary Sciences* pp 1-7.
- 141- Ibrahim, S. M.; Hassanin, F. S.; Abou-Elroos, N. S. and Shaltout, F.A (2025): Quantifying The antimicrobial Efficacy of Selected Herbal Essential Oils Against Bacteria in Simulated Beef Steak Conditions. *Egyptian Journal of Veterinary Sciences*, pp 1-9.
- 142- Shaltout, F. A. (2024): The Availa bility, the Price, the Tradition, the Reli gion, the Income, the Social, the Develop ment and the Economic Influences on the Meat Consumption. *Biomed J Sci & Tech Res* 55(4)-2024. BJSTR. MS.ID.008734.
- 143- Ibrahim, S. M.; Hassanin, F. S.; Abou-Elroos, N. S. and Shaltout, F.A (2025): Evaluating The impact of Certain Herbal Essential Oils on The Shelf Life and Chemical Composition of Beef Steak. *Egyptian Journal of Veterinary Sciences*, pp. 1-8.
- 144- Shaltout, F. A. (2024): Our Opinion on Using of Irradiation in Food Preservation and Production. *Journal of Medical and Clinical Case Reports*, 1(6): 1-9.
- 145- Anees, K. P; El-diasty, E. M. and Shaltout, F. A. (2023): Mycological Evaluation and Occurrence of Aflatoxins and Ochratoxin A in Tilapia Oreochromis niloticus Fish and Fish Products. *Journal of Advanced Veterinary Research* ,13(7):1381-1385.
- 146- AMR, A. K; HASSANIN, F. S.; HASSAN, M. A. and SHALTOUT, F. A. E. (2024): TRIALS TO ESTIMATE AND CONTROL THE RESIDUAL LEVELS OF HETEROCYCLIC AROMATIC AMINES IN MEAT PRODUCTS. *Assiut Vet. Med. J.*, 70 (182): 98-105.
- 147- Shaltout, F. A.; Mohammed, I.; Afify, E. A. (2020): Detection of E. coli O157 and Salmonella species in some raw chicken meat cuts in Ismailia province, Egypt. *Benha Veterinary Medical Journal* 39(2): 101-104.

- 148- Hassanin, F. S.; Shaltout, F. A.; Maarouf, A. A.; El-Sisy, S. F.; Ahmed, A. E. (2020): Bacteriological profile of frozen chicken meat cuts at Qalubiya governorate markets. *Benha Veterinary Medical Journal* 39 (2) 1-5.
- 149- 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 Veterinary Medical Journal* 40 (42) 12-16.
- 150- Shaltout, F. (2024) Application of Irradiation in Food Preservation and Production. *Journal of Pathology Research Reviews & Reports*. 6(5): 1-8.
- 151- Taha, S. T.; Shaltout, F. A.; Shimaa, N. E. N.; Mohamed, E. Nabil, M. E. (2024): Effect of lavender oil, clove oil and frankincense extract on sensory and microbial properties of raw drumsticks in refrigerator. *Benha Veterinary Medical Journal* 46 (1) 135-139.
- 152- Shaltout, F. A.; Salem, R. M.; Eldiasty, E. M and Diab, F. A. (2023): Experimental Study on the Effect of Propionibacterium and Acetic acid on *Candida albicans* contamination in chicken fillet Stored at Chilling Conditions. *Benha Veterinary Medical Journal* 43 (2) 91-96.
- 153- Mubarak, S. R.; Abou EL-Roos, N. A.; Hussein, M. N. and Shaltout, F. A. E. (2024): Comparative microbiological evaluation between fresh and frozen bovine liver. *Benha Veterinary Medical Journal* 47 (1) 99-102.
- 154- El Asely, M. M.; Fath Elbab, G. F.; Shaltout, F. A. E. (2024): Antibiotic Residues in Commercially Available Freshwater and Marine Fish: A Risk Assessment. *Egyptian Journal of Aquatic Biology & Fisheries*, 28(1): 397 – 410.
- 155- El Asely, M. M.; Fath Elbab, G. F. and Shaltout, A. E. (2025): Impact of Freezing Intervals on Oxytetracycline and Ciprofloxacin Residues in Nile Tilapia and Catfish Muscles. *Egypt. J. Vet. Sci.* 1419-1424.
- 156- Elkholy, R. A.; Abou EL-Roos, N. A.; Hussein, M. N. and Shaltout, F. A. E. (2025): Differential Microbiological Quality on Marketed Frozen Turkey Breast and Thigh Meat. *Egypt. J. Vet. Sci.* 56, (1), pp. 1-10
- 157- Shaltout, F. A. (2024): THE FOOD ADDITIVES USED IN FOOD PRODUCTION, ADVANTAGES AND DISADVANTAGES. *World Journal of Internal Medicine and Surgery* 1(6): 1-17
- 158- Shaltout, F. A. (2024): Right Methods to Extend the Meat Shelf- Life by Using of Natural Preservatives and Their Public Health Importance. *Journal of Medicine Care and Health Review* 1(2): 1-17.
- 159- 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. doi:10.56397/JPEPS.2022.11.05
- 160- Shaltout, F. A. (2024): Importance of Extending the Shelf Life of the Meat. *Journal of Medical and Clinical Case Reports* 01 | (9): 1-10.
- 161- Shaltout, F. A. E., Mona N. Hussein, Nada Kh. Elsayed (2023): Histological Detection of Unauthorized Herbal and Animal Contents in Some Meat Products. *Journal of Advanced Veterinary Research* (2023) 13(2): 157-160.
- 162- Shaltout, F. A (2023): Abattoir and Bovine Tuberculosis as A Reemerging Foodborne Disease. *Clinical Medical Reviews and Reports* 6(1): 1-7
- 163- 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.
- 164- Shaltout, S. and Shaltout, F. (2024), "Food Borne Bacterial Diseases Due to Consumption of Meat, Fish and Poultry Products", *Arch Health Sci*; 8(1): 1-8.
- 165- Shaltout, F. A. (2024): Our Opinion on Using of Irradiation in Food Preservation and Production. *Journal of Medical and Clinical Case Reports* 01 |(6): 1-9
- 166- Hakeem, K. P.; El-diasty, E. M.; Shaltout, F. A. E. (2023): Effects of natural compounds of some plants on microbial contamination and sensory quality of fish fillet during refrigeration. *Benha Veterinary Medical Journal* 45 (1) 152-156.



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