MATHEWS

Review Article

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Viruses in Beef, Mutton, Chevon, Venison, Fish and Poultry Meat Products

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ABSTRACT

Beef means meat of cattle, mutton means meat of sheep, chevon means meat of flesh of the goat used as food, venison means meat of dear, fish means meat of fish and shellfish, poultry means chicken, duck, geese, turkey, pigeon and rabbit. Beef, mutton, chevon, venison, fish and poultry meat act as a main sources of animal protein, in recent decades, viruses have been increasingly known as important causes of foodborne diseases mostly due to the improved methods of diagnosis and investigation of viruses. Viruses transmission through consumption of infected beef, mutton, chevon, venison, fish and poultry meat products or contact with contaminated beef, mutton, chevon, venison, fish and poultry meat products and water is now well known. The viruses most frequently involved in foodborne infections are public noroviruses, hepatitis A virus, human rotavirus, and hepatitis E virus. Beef, mutton, chevon, venison, fish and poultry meat act as major sources of animal protein, NoV and RV infections are common cause of acute human gastroenteritis, while hepatitis A virus and hepatitis E virus cause human hepatitis worldwide. Most of the cases remain unreported due to subclinical cases.

Keywords: Virus, Beef, Mutton, Chevon, Venison, Fish, Poultry Meat Products.

INTRODUCTION

Beef, mutton, chevon, venison, fish and poultry meat act as a main sources of animal protein, Foodborne viruses are generally very infectious and their spreading are rapidly from one individual to the next, although several exceptions are exist as hepatitis E virus. The most of foodborne viruses outbreaks were linked with the infected food handlers, as hepatitis A virus are mainly transmitted between humans [1-8]. In contrast hepatitis E virus has been identified as an important disease. Beef, mutton, chevon, venison, fish and poultry meat can potentially be contaminated throughout the whole food product chain and sources of contaminations can include equipment, other contaminated food and Beef, mutton, chevon, venison, fish and poultry meat or meat products, originating from infected animals and water [9-17].

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Beef, mutton, chevon, venison, fish and poultry meat act as a main sources of animal protein, and shellfish are the major food categories involved in foodborne of viral gastroenteritis origin [18-26]. However, risky Beef, mutton, chevon, venison, fish and poultry meat are considered particularly those that are intended for direct consumption or that are not properly heat treated before consumption [2,3,11,27,28-32].

Objective of this this study is to throw a light on virus contamination of animal protein and its public health importance.

Investigation of viruses in Beef, mutton, chevon, venison, fish and poultry meat products [2,3,10,11,33-35].

Polymerase Chain Reaction method for Hepatitis A virus investigation

PCR method, polymerase chain reaction method, is a mean for amplification of a region of DNA whose arrangement is known or lies between two portions of known arrangement.

Before PCR, DNA of interest could be amplified by over-expression in cells and this with limited yield.

Components

- DNA template
- Primers
- Enzyme
- dNTPs
- Mg2+
- Buffers1- DNA template

1. DNA template

- DNA containing region to be arrangement
- Size of target DNA to be amplified: up to 3 Kb

2. Primers

- Two sets of primers
- Generally 20-30 nucleotides long
- Synthetically produced complimentary to the 3' ends of target DNA not complimentary to each other Primers (• Not containing inverted repeat arrangement to avoid formation of internal structures
- 40-60% GC content preferred for better annealing
- Tm of primers can be calculated to determine annealing T0
- Tm=.41(%G+C) + 16.6log(J+) + 81.5 where J+ is the concentration of monovalent ions

3. Enzyme

- Usually Taq Polymerase or anyone of the natural or Recombinant thermostable polymerases.
- Stable at T0 up to 950 C
- High processivity
- Taq Pol has 5'-3' exo only, no proofreading

The PCR Cycle Comprised of 3 steps: -

1. Denaturation of DNA at 95 C
2. Primer hybridization (annealing) at 40-50 C
3. DNA synthesis (Primer extension) at 72 c72

RT-PCR method

- Reverse Transcriptase PCR
- Uses RNA as the initial template
- RNA-directed DNA polymerase (rTh)
- Yields ds cDNA

Investigation of amplification products

- Gel electrophoresis
- Sequencing of amplified fragment
- Southern blot

Advantages

- Automated, fast, reliable (reproducible) results
- Contained: (less chances of contamination)
- High output
- Sensitive
- Broad uses
- Defined, easy to follow protocols

ELISA method for Food Borne Viruses investigation:

ELISA method is a biochemical method used mainly in immunology to detect the presence or absence of an antibody or an antigen in a beef, mutton, chevon, venison, and fish and poultry meat samples.

The method is divided into

1. Competitive ELISA method.

2. Sandwich ELISA method or direct ELISA method.
3. Indirect ELISA method.

Competitive ELIZA method

- The labeled antigen competes for primary antibody binding places with the beef, mutton, chevon, venison, and fish and poultry meat samples antigen. The more antigen in the beef, mutton, chevon, venison, fish and poultry meat samples, the less labelled antigen is retained in the well and the weaker the signal.

Sandwich ELISA

- The ELISA plate is coated with Antibody to detect specific antigen. Prepare a surface to which a known quantity of capture antibody is bound.
- Block any nonspecific binding sites on the surface
- Apply the antigen-containing sample to the plate. Wash the plate, so the unbound antigen is removed. Apply enzyme linked primary antibodies as investigation antibodies which also bind specifically to the antigen. Wash the plate, so the the unbound antibody enzyme conjugates are removed.
- Apply a chemical which is converted by the enzyme into a coloured product.
- Detect the absorbency of the plate wells to investigate the presence and quantity of antigen

Indirect ELISA

- The protein antigen to be tested is added to each well of ELISA plate, where it is given time to adhere to the plastic by charge interactions.
- A solution of non-reacting protein is added to block any plastic surface in the well that remains uncoated by the protein antigen

Then the serum is added, which contains a mixture of the serum antibodies, of unknown concentration, some of which may bind specifically to the test antigen that is coating the well. Afterwards, a secondary antibody is added, which will bind to the antibody bound to the test antigen in the well. This secondary antibody often has an enzyme attached to it.

A substrate for this enzyme is then added. This substrate changes colour upon reaction with the enzyme. The colour change shows that secondary antibody has bound to primary antibody, which strongly implies that the donor has had an immune reaction to the test antigen. The higher the concentration of the primary antibody that was presents in the serum, the stronger the colour change. Often a spectrometer is used to give quantitative values for colour strength

DISCUSSION

Beef, mutton, chevon, venison, fish and poultry meat act as a main sources of animal protein. Viruses are transmitted through foods in the form of extremely small particles, they ranging in size nearly from twenty five nanometers to less than one hundred nanometers in diameter [2,11,35-41]. Virus structure is mainly nucleic acid core with a protein coat. A few have an additional, lipid-containing envelope [19-21,42-46]. The particles are roughly spherical in shape and are totally inert, in the sense that they cannot carry out any of what are commonly regarded as life processes [2,10,34,47-51].

Beef, mutton, chevon, venison, fish and poultry meat act as a main source of animal protein, viruses are of concern to health because of their ability to produce infections, some of which result in disease [19-21,52-56]. They do this depend up on a very selective basis. Viruses that infect public tend not to be capable of infecting other species, with the exception of our closest evolutionary relatives [12,57-63]. Viruses that infect other animal species tend not to be infectious for humans [64-67]. The exceptions, viruses that are occasionally transmitted from Beef, mutton, chevon, venison, fish and poultry meat act as a main sources of animal protein, to man, are not known to be transmitted through Beef, mutton, chevon, venison, fish and poultry meat and meat products [10,12,68-74]. In addition to their species specificity, viruses show a distinct individual preference for infecting certain tissues or organs of the host's body [20,21,57,58,75-79]. This tissue specificity determines which cells of the host's body become infected and what symptoms are likely to disease result from virus infection. Whether or not they cause disease, virus infections tend to be self-limiting [4,19,58,81-84].

Beef, mutton, chevon, venison, fish and poultry meat act as a main sources of animal protein, The body's immune processes ordinarily suppress a virus infection after some period of time, so the presence of viruses as obligate parasites depend up on their ability to pass from one host to another host. Viruses that infect humans are principally transmitted directly from person to person, either by actual touching or by aerosols over short distances. However, they are also capable of being transmitted indirectly through food and water, as well as a few

other means [1,12,19,58,85-89].

Beef, mutton, chevon, venison, fish and poultry meat act as a main sources of animal protein, Virus contamination of foods has been categorized as primary or secondary, depending upon whether the viruses are present in the beef, mutton, chevon, venison, fish and poultry at the time of slaughter. In the case of Beef, mutton, chevon, venison, fish and poultry meat and meat products [4,9,12,69,90-95, the viruses that are already present at the time of slaughter are of little concern to public health. Instead, the outbreaks recorded indicated that what problems were lied in beef, mutton, chevon, venison, fish and poultry meat contamination, usually mishandling of Beef, mutton, chevon, venison, fish and poultry meat by a person with an gut virus infection [18,57,58,96-100]. public gut viruses in sewage have also contaminated Beef, mutton, chevon, venison, fish and poultry meat and meat products; but neither insects nor rodents are known to have served as vectors in secondary contamination of Beef, mutton, chevon, venison, fish and poultry meat, despite the obvious possibility that they might do so [3,11,27,101-105].

Contamination of Beef, mutton, chevon, venison, fish and poultry meat act as a main sources of animal protein does not guarantee that a consumer infection will result (nor, for that matter, do most virus infections result in overt disease). Virus that has been introduced into Beef, mutton, chevon, venison, fish and poultry meat cannot possibly multiply, but may be inactivated (deprived of its infectivity) before the Beef, mutton, chevon, venison, fish and poultry meat are eaten [58,106-110]. This can come about in a number of ways, the one of most practical significance being thermal processing or cooking [33,111-116]. The times and temperatures required for virus inactivation in Beef, mutton, chevon, venison, fish and poultry meat cannot be specified precisely [2,10,34,117-122].

Beef, mutton, chevon, venison, fish and poultry meat act as a main sources of animal protein, Viruses in a rare steak probably are no threat to public health because viruses within the muscle are likely to be of animal origin and therefore not infectious for the consumer [123-127]. Viruses in ground beef, however, may be of human origin: the heat stability of viral contaminant varies with the fat content of the ground beef, but complete inactivation can apparently be assured by cooking the Beef, mutton, chevon, venison, fish and poultry meat until all pink colour disappears from the center [57,58,128-133]. Virus on the surface of Beef, mutton, chevon, venison, fish and poultry meat can probably be inactivated by ultraviolet light, and ionizing radiation can inactivate virus in subsurface locations [134-138]. Although the coat proteins of some viruses are apparently biodegradable, microbial decomposition of Beef, mutton, chevon, venison, fish and poultry meat through prolonged storage evidently has little effect upon the virus [2,35,139-143].

Beef, mutton, chevon, venison, fish and poultry meat act as a main sources of animal protein, There is one important exception to some of the above generalizations that should be mentioned [10,34,144-149] the virus of foot and mouth disease, which is no direct threat to human health but has great economic significance, is chemically degraded in voluntary muscle by the acid of rigor mortis but is protected from this, and withstands a great deal of heat, in lymph nodes, bone marrow, and large blood clots [19,21,57,58].

Beef, mutton, chevon, venison, fish and poultry meat act as a main sources of animal protein, Many kinds of viruses in Beef, mutton, chevon, venison, fish and poultry meat can be detected on the basis of their ability to produce infections in cell cultures. The absolutely necessary steps in the investigation process are to make a fluid suspension of the sample and inoculate it into a culture of susceptible cells; however, in practice, several additional steps are usually required. Detection of viruses that are of significance to public health, but no type of cell culture is known to be susceptible to the virus of hepatitis A or to some of the viral gastroenteritis agents. The methods that are available are used, despite their cost and complexity, because they are not valid indicators, the presence of which would indicate the virus contamination of beef, mutton, chevon, venison, fish and poultry meat had occurred [12,19,21,57].

Plant or market samples of Beef, mutton, chevon, venison, fish and poultry meat and meat products have been tested for viral contaminants. Ground beef has attracted a great attention, human viruses were detected in market Beef, mutton, chevon, venison, fish and poultry meat and meat products, and Hepatitis has shown that viral contamination of ground beef can be a threat to public health. Gut virus infections are common in slaughter animals. Viruses were also found in some by-products, but the viruses apparently were not

infectious for human, and none were found in market Beef, mutton, chevon, venison, fish and poultry meat and meat products [3,4,11,68].

human viral diseases associated with Beef, mutton, chevon, venison, fish and poultry meat have included only hepatitis A, a lingering, debilitating disease that is very specific for human and is transmitted by a fecal-oral cycle. Other human gut viruses might well be transmitted through Beef, mutton, chevon, venison, and fish and poultry meat in the same way on occasion, as is beginning to be observed with other foods. They are not transmitted between humans and animals and that, where this could be determined, all of the events of contamination that led to outbreaks took place in Beef, mutton, chevon, venison, fish and poultry meat and meat products service or retail establishments [2,10,34,35].

Infected butcher contaminated steak tartare (seasoned raw ground beef) in such a way that consumers became ill with heptatitis A., contaminated Beef, mutton, chevon, venison, fish and poultry meat and meat products cause more consumer illnesses, a cafeteria, contaminated roast meat during boning and slicing sufficiently to cause illness in students and faculty. In each of these instances, the virus that contaminated the Beef, mutton, chevon, venison, fish and poultry meat and meat products originated in the human gut: contamination was either direct, or indirect by way of wastewater [3,4,11,49,68].

CONCLUSION

Beef, mutton, chevon, venison, fish and poultry meat -associated viral disease reveals that are not transmitted to consumers causative beef, mutton, chevon, venison, fish and poultry meat. However, viruses that originate in the human gut are as likely to contaminate Beef, mutton, chevon, venison, fish and poultry meat as other foods and, if not inactivated before the Beef, mutton, chevon, venison, fish and poultry meat is eaten, may cause infections in consumers. Recorded incidents have resulted from mishandling Beef, mutton, chevon, venison, fish and poultry meat in food service or retailing, rather than in slaughtering or processing. Viral contamination of Beef, mutton, chevon, venison, fish and poultry meat can be avoided by the same precautions in sanitary Beef, mutton, chevon, venison, fish and poultry meat and meat products handling that are applicable to any other foods. From the standpoint of public health, the viral hazards associated with Beef, mutton, chevon, venison, fish and poultry meat is significant, but by no means as severe as those of botulism or salmonellosis.

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