OCCURRENCE OF *LISTERIA MONOCYTOGENES* IN RAW FRESH AND FROZEN RED MEAT(CATTLE, CAMEL,SHEEP) IN TEHRAN PROVINCE-IRAN

Zohreh Mashak[1], Afshin Mottaghifar[2], Hamidreza Sodagari [3], Amirreza Sa'adati[4]

[1]Department of Food Hygiene, Faculty of Veterinary Medicine, Islamic Azad University, Karaj Branch, Karaj, IRAN
[2]D.V.M., Meat inspector of Robatkarim slaughterhouse-Robatkarim-IRAN
[3]D.V.M. of Faculty of Veterinary Medicine, Islamic Azad University, Karaj Branch, Karaj, IRAN
[4]Sampad, Karaj, Iran
[*]Corresponding author (phone: +00989123612387; e-mail: Uzohreh_mashak@yahoo.com)

***Abstract*-The presence of *Listeria monocytogenes* was investigated in a total of 72 raw fresh and frozen meat samples(cattle, sheep, camel) obtained from different supermarkets in Tehran province in 2009. Identification, enumeration and serotyping used by modified Canadian FDA method, MPN technique and Bacto-Listeria-O polyvalent antiserum, respectively. Occurrence of *L. monocytogenes* varied from 0% in (frozen sheep meats) to 50% in (raw fresh cattle meat). MPN values of *L. monocytogenes* were from 0.18(raw fresh frozen cattle, (camel meat) till 7×10^2 (raw fresh cattle meat). All of positive meat samples fell into serogroups: 1, 4, other in raw fresh and frozen cattle meat and serotype 4 in raw camel, sheep and frozen camel The high percentage of *L. monocytogenes* in different red meat samples is a real threat for consumer's health, so use of hygienic conditions in the chain of breeding, slaughtering, handling , processing and transportation is necessary.**

***Index Terms - Listeria monocytogenes,* Raw fresh and frozen Red meat, Tehran**

I. Introduction

Listeria monocytogenes is a gram positive, which is ubiquitous in nature,and associated with a variety of environments like soils, water, sewage, silage and intestinal contents of a variety of animal, birds and fish as well as animal food products (Marinjek & Grebenc 2002). It can grow well at refrigeration temperature. There are many reports of this organism isolation from different meats and their products such as 52% of raw ground beef (Guerini, Bosilevac, Koohmaraie 2007).it is the main concern in several kinds of raw and processed meat that can causes large *listeriosis* outbreaks (Anonymous, 2000). The high incidence of this pathogen in kinds of foods, Is as a hazard public health, so we decided to survey the identification, enumeration and serotyping of *L. monocytogenes* in several kinds of red meats.

II. Materials and methods

72 of fresh raw and frozen meats (cattle, sheep, camel) sampled from different supermarkets in Tehran province in 2009 .The modified Canadian version of the U.S. FDA Listeria isolation protocol was used for isolation of *L. monocytogenes* (Dillon, Patel, Ratnam 1992). Briefly, 25 g sample was homogenized in 225ml Listeria enrichment broth (LEB, Merck) containing potassium thiocyanate (Merck) and nalidixic acid (50µgml^{-1}, w/v; Sigma), using a stomacher and incubated at 30 ºC for 24h and 48h. A loopful from LEB was then streaked on to Listeria selective agar (Merck) containing nalidixic acid (Sigma) and PALCAM Listeria selective agar (Merck) supplemented with PALCAM Listeria selective supplement (Merck). Suspected colonies were confirmed by Gram staining, motility test and biochemical tests (APHA, 1992; Harrigan, 1998). Serotypes were determined using Bacto-Listeria-O polyvalent antiserum. For enumerate the bacteria in the samples, briefly, each 25-g sample was homogenized with 225ml of LEB (Merck) and 10-fold serial were prepared. The most probable number (MPN) technique was used for estimating *L. monocytogenes,* using 10^{-1}, 10^{-2} and 10^{-3} and sets of five tubes containing LEB (Merck) containing potassium thiocyanate and nalidixic acid. Briefly, five replicates of 10ml of 10^{-1} were inoculated into 20ml of double-strength LEB and five replicates of 1ml of 10^{-1}, 10^{-2} and 10^{-3} were inoculated into the second, third and fourth sets of 10ml of LEB. After incubation at 30ºC for 24 and 48h, 20µl of the enrichment broth was on each plate served to identify *L. monocytogenes* (APHA, 1992).

III. Results and Discussion

A total of 72 different meat samples were collected during a period of 6 month from different grocery stores and supermarkets of Tehran province in 2009. The incidence and MPN and serotyping of *L. monocytogenes* in the meat samples analyzed in Table 1. *L. monocytogenes* was obtained from 19(26.38%) out of the 72 meat samples tested. The occurrence of this organism was from 0% (frozen sheep meat) to 50% (raw fresh cattle meat). MPN values of *L. monocytogenes* were from 0.18(frozen cattle, camel meats) till 7×10^2 (raw fresh cattle meat). All of positive meat samples fell into serogroups: 1, 4, other. 57.89% , and serotype 4, 42.11% , respectively.

Table 1. Incidence and MPN and serotyping of *Listeria monocytogenes* in raw fresh and frozen meat (cattle, sheep, camel)

Kinds of meat	**Number of samples**	**Number of L.M positive (%)**	**MPN/g (Min-Max)**	**Serotyping (1,4,others)%**
*Raw fresh cattle	12	6(50%)	11-700	1,4,others
Frozen cattle	12	5(41.66)	o.18-220	1,4,others
*Raw fresh sheep	12	1(8.33%)	19	4
Frozen sheep	12	0(0%)	0	-
*Raw fresh camel	12	4(33.33)	0.8-1.9	4
Frozen camel	12	3(25%)	0.18-4	4
Total	72	19(26.38%)	0-700	1,4,others

*Refrigerated

L. monocytogenes has been isolated from intestinal contents of a variety of animals, such as cow, sheep, camel(Wang, Yan, Feng 1992). This bacteri*a* have been isolated from many different types of raw and processed food, but the main sources and routes of contamination are still not fully understood(Gudbjörnsdóttir *et al.* 2004)it has been reported 52% of raw ground beef(Guerini ,2007) 6.16% in raw and cooked beef (Cel, Itak, Nder 2005).Also the rate of this pathogen in raw beef was 35% (Ye, Neetoo, Chen 2008). In our study, 19(26.38%) samples were contaminated to *L. monocytogenes.* The high and the lowest contaminated samples were 50% in raw fresh cattle meat and 8.33% in raw fresh sheep meat respectively. It is generally accepted that meats cannot be free from the pathogen because of the methods of slaughter, evisceration and sample preparation, handling and transportation of carcasses, allow ample opportunity for cross-contamination to occur. This idea is similar to(Vitas, Aguado, Garciajalon 2004).Also it concern the sufficient humidity, low tempreture of environment of slaughter house and refrigerator of supermarkets are effective factors for survive and proliferation of *L. monocytogenes* .As result in accomplished serotyping, serogroup 4(100%)was the most serogroup. Sun, Soon, Dong, Kyung, Chang (2000) reported that the rate of the appearance of serotype 4 comparing with other serotypes are more, similar to this study. It seems that geographical distribution of different serotypes in kinds of meat, is dependent of a geographical region. In relation to performed MPN, in accordance to advices of (ICMSF, 1995), the amount of *L. monocytogenes*, shouldn't be more than 100cfu/g in per consumption.

IV. Conclusion

The high percentage of *L. monocytogenes* in different red meat samples is a real threat for consumer's health, so use of hygienic conditions in the chain of breeding, slaughthering, handling, processing and transportation are necessary.

V. References

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