Prevalence of Listeria monocytogenes in poultry meat in Vidharba region of India

D.R. KALOREY1, S. B. BARBUDDHE2*, N. V. KURKURE3 and P. S. GUNJAL1

1Department of Veterinary Microbiology, 2ICAR Research Complex, ELA Goa, 3Department of Veterinary Pathology, Nagpur Veterinary College, Nagpur 440006 INDIA
*sb@icargoa.nic.in

Keywords: Listeria monocytogenes; poultry meat; India

Summary
In India there is practice to sell freshly slaughtered poultry meat. A total of 94 poultry meat samples were collected from poultry meat shops. These samples were processed for isolation of Listeria spp by adopting standard protocol. Out of 14 Listeria spp recovered 8 isolates were confirmed as L. monocytogenes by biochemical & in vitro pathogenicity test. Present findings indicate need of improvement in hygienic practices while slaughtering and sell of poultry meat as L. monocytogenes is of zoonotic pathogen.

Introduction
Listeria monocytogenes is a gram positive, facultative, intracellular bacteria which is ubiquitous in nature. Poultry meat and products frequently have been implicated in outbreaks of food borne illness. Live broilers coming into poultry processing may contribute to food poisoning outbreaks. Due to hot and humid climate the bacterial load on the surface of dressed poultry available in market channel is comparatively higher. Meat produced in retail outlets is not wholesome and safe for consumption as compared to the meat processed in organized processing plants. For these reasons, more emphasis should be given to the centralized slaughter and processing at the organized sector have hygienic environment.

L. monocytogenes has also been implicated as a cause of neurological signs and severe mortality in broilers (Vijayakrishna et al., 2000). L. monocytogenes has been isolated from 9.2 to 60 % samples of poultry meat (Uyttendaele et al., 1997; Kwiatek et al., 1992). In India, L. monocytogenes has been isolated from poultry meat (Barbuddhe et al., 2003). An attempt was made to isolate Listeria spp. from poultry meat from Vidharba region of India.

Materials and methods
A total of 94 poultry meat samples were collected from Nagpur district of Vidharba region of India in UV sterilized polyethylene sachets from local market, transported on ice and stored at 4°C till processed for microbiological analysis.

All the samples were processed for microbiological analysis within 24 h of collection. Isolation of Listeria was attempted from the collected meat samples as per the USDA method described by McClain and Lee (1988) after some necessary modifications. Meat samples (approx.10 gm each) were placed in a sterile polyethylene sachet containing 90 ml University of Vermont Medium 1 (UVM1) and mixed thoroughly for 5 min and incubated overnight at 30°C. Then 0.1 ml of the enriched inoculum from UVM1 was transferred to UVM 2 and again incubated overnight at 30°C. The enriched inoculum from UVM2 was streaked onto Dominguez-Rodriguez isolation agar (DRIA) and plates were incubated at 30°C for 48 h.

The greenish yellow, glistening, iridescent and pointed colonies of about 0.5 mm diameter surrounded by a diffuse black zone of aesculin hydrolysis were considered to be of Listeria. The presumed colonies of Listeria (at least 3/plate) were further confirmed. Morphologically typical colonies were verified by Gram's staining, catalase reaction, tumbling motility at 20-25°C, methyl red-Voges Proskauer (MR-VP) reactions, nitrate reduction, fermentation of sugars (rhamnose, xylose, mannitol and α-methyl-D-mannopyranoside), haemolysis on 5% sheep blood agar and CAMP with Staphylococcus aureus.
Results and discussion

Out of the 94 samples examined, 14 isolates of Listeria sp. were recovered. Of these 8 isolates displayed beta-haemolysis on blood agar and positive CAMP test. Thus, Listeria monocytogenes were confirmed from 8 (8.5%) of 94 poultry meat samples. The percentage of culture positivity of Listeria spp. in meat in the present study is in agreement with the reported incidences as 9.2% (Uyttendaele et al., 1997). Lawrence and Gilmour (1994) reported isolation of L. monocytogenes and Listeria sp. from 26% and 15%, and 46% and 29% of the samples collected from raw (79) and cooked (173) poultry processing environments, respectively. Presence of L. monocytogenes in the meat samples collected from retail outlets indicates the need for environmental cleanliness. Faecal contamination of carcasses during dressing is thought to be a source of contamination as faecal samples contain Listeria spp (Cox et al., 1997).

Concern regarding the growth of Listeria in processed foods at refrigeration temperature resulted in the institution of a zero-tolerance limit (absence in 25 g) for L. monocytogenes in ready-to-eat products by the USDA (Czuprynski 1994). Control of microbial contamination in meats requires a multifactorial approach. The measures should be defined according to stages in production of meat. The incidence of L. monocytogenes in raw meat is of considerable public health significance as processed meats are implicated as a cause of listeriosis (McLauchlin et al., 1991). Improvement of hygienic conditions at slaughter process particularly effective disinfection procedures has been recommended to reduce the risk to human health.

References


