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The marked increase of *Listeria monocytogenes* isolation from contents of swine cecum

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Abstract

The actual prevalence of *Listeria monocytogenes* from contents of swine cecum was investigated. The efficiency of *Listeria* enrichment broth (LEB) for isolation was examined by the recovery of artificially inoculated *L. monocytogenes* in contents of swine cecum. The numbers of organisms did not increase after 48 h incubation, but increased when the rapid decrease in pH of the LEB was adjusted. Between 1991 and 1993, 250 contents of swine cecum were examined for the prevalence of *L. monocytogenes* using LEB enrichment, either with or without pH adjustment. *L. monocytogenes* was isolated from 74 samples in 1993 with pH adjustment, however, no organisms were isolated in 1991 and 1992. It was suggested that the marked rise of the *L. monocytogenes* isolation was due to the spread of the organism among swine. Furthermore, 67 out of the 74 isolates were identified as 1/2c by serotyping. The serovar 1/2c strains showed genetic diversity by random amplified polymorphic DNA.

Keywords: *Listeria monocytogenes*; Swine; *Listeria* enrichment broth; pH adjustment; Marked increase of isolations

Résumé

La prévalence actuelle de *Listeria monocytogenes* dans les caecums de porcs a été recherchée. L'efficacité d'un bouillon de culture pour l'enrichissement des *Listeria* (LEB) a été examinée pour

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isoler *Listeria monocytogenes* inoculées artificiellement dans les caecums de porcs. Le nombre de micro-organismes n'augmente pas après 48 h d'incubation mais augmente après diminution rapide du pH. Entre 1991 et 1993, 250 contenus de caecum de porcs ont été examinés pour étudier la prévalence de *Listeria monocytogenes* en utilisant le bouillon enrichi (LEB) avec ou sans ajustement de pH. *Listeria monocytogenes* a été isolée de 74 prélèvements en 1993 avec ajustement de pH alors qu'aucun organisme n'a été isolée en 1991 et 1992. Il a été suggéré que le taux élevé d'isolement de *Listeria monocytogenes* était dû à la diffusion du microorganisme chez le porc. En outre, 67 parmi les 74 isolats ont été identifies comme appartenant au serovar1/2c, par sérotypie. Les souches appartenant au serovar 1/2c ont montré une diversité génétique par la méthode de l'ADN polymorphe amplifié.

Mots-Clés: Listeria monocytogenes; Porc; Bouillon de culture enrichi; Ajustement du pH; Augmentation marquée du nombre d'isolats.

1. Introduction

Although many food-borne mass outbreaks caused by *Listeria monocytogenes* have been reported around the world [1,2], only one food-borne mass outbreak of listeriosis has been recently reported in Japan [3]. In the Japanese outbreak, contaminated natural cheeses were consumed by 86 individuals. Flu-like symptoms and gastroenteritis were observed in 32 patients and *L. monocytogenes* serovar 1/2b was isolated from 19 of the patients.

Many kinds of foods have been reported to be contaminated by *L. monocytogenes*. Recently, Okutani et al. [4] reported that the status of food contamination by *L. monocytogenes* in Japan was almost same as that in foreign countries, suggesting that contamination of foods other than dairy products may cause food-borne mass listeriosis in Japan. Meat and meat products are considered to be one of the important sources of human listeriosis [1]. Several cases of food-borne mass listeriosis that originated with pork products have occurred in European countries [1,5–7]. *L. monocytogenes* from swine might contaminate the processing plant environment and subsequently contaminate the pork products [8–13]. In fact, the isolation rate of the organism from pork products is significantly higher than that from swine fecal samples [7, 10,12,14–17]. If the isolation rates of the organism from swine fecal samples reflects the actual prevalence, the source of contamination in pork products may well be contaminated food processing environments.

In the previous investigations [14–17], *Listeria* enrichment broth (LEB) [18], UVM broth, potassium thiocyanate broth, or cold enrichment method [19] were used for the enrichment culture of *L. monocytogenes*. The enrichment culture by either potassium thiocyanate broth or cold enrichment method is reported to be less effective than that using LEB or UVM broth [19–23]. Although LEB and UVM broth were developed for the isolation from food samples, whether these broths are appropriate for the enrichment culture of *L. monocytogenes* from fecal samples is unknown. It was reported that the rapid decrease in pH of LEB during enrichment inhibited the growth of *L. monocytogenes* in food samples [24–27]. Moreover, the efficacy of enrichment with UVM broth was inferior