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Presence of Listeria monocytogenes in fresh salad vegetables.

Brief Communication

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SUMMARY.

Introduction. An increase in the consumption of fresh vegetables for a healthy diet has occurred during the last few years, but it mustn't be forgotten that they can carry pathogenic microorganisms such as *Listeria monocytogenes*.

Material and methods. The presence of *Listeria monocytogenes* was evaluated in 50 salad samples according to the methodology described by Vanderzant & Splittstoesser.

Results. *Listeria* spp. was isolated from 32% (16/50) of the samples analyzed, from these, 8% (10/16) were *L. monocytogenes*, 8% (4/16) a *L. welshimeri* and 4% (2/16) *L. murrayi*.

Discussion The presence of *Listeria monocytogenes* in fresh salad vegetables represents a potential risk to public health, since its infective dose has not been established yet and its ability to survive and grow in raw vegetables has been demonstrated. Dietary changes should be promoted in groups where this bacteria represents a risk. (*Rev Biomed 1999; 10:29-31*)

Key words: *Listeria* spp., *Listeria monocytogenes*, salad, vegetables.

RESUMEN.

Presencia de *Listeria monocytogenes* en vegetales frescos.

Introducción. En los últimos años, se ha dado un incremento en el hecho de consumir vegetales frescos como parte de una dieta sana, pero no se puede descartar el que estos pueden actuar como vehículos de microorganismos patógenos, como *Listeria monocytogenes*.

Material y métodos. Se evaluó la presencia de *Listeria monocytogenes* en 50 muestras de ensalada, según la metodología descrita por Vanderzant y Splittstoesser.

Resultados. Se aisló *Listeria* spp. a partir de 32% (16/50) de las muestras analizadas, de éstas, 8% (10/16) correspondió a *L. monocytogenes*, 8% (4/16) a *L. welshimeri* y 4% (2/16) a *L. murrayi*.

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Discusión. La presencia de *L. monocytogenes* en ensalada de vegetales frescos representa un riesgo potencial para la salud pública, dado que su dosis infectante no ha sido claramente definida y está demostrada su capacidad de sobrevivir en vegetales crudos. Se debe de promover cambios de dieta en grupos donde esta bacteria representa un riesgo. (*Rev Biomed 1999; 10:29-31*)

Palabras clave: *Listeria* spp., *Listeria monocytogenes*, ensalada, vegetales.

INTRODUCTION.

During recent years there has been an increasing emphasis on the importance of the consumption of fresh vegetables for a healthy diet. Fresh vegetables are an important source of fiber, β carotenes, vitamin C and other nutrients, but they can also carry pathogenic microorganisms.

Seven species of *Listeria* spp. have been identified, but *L. monocytogenes* is the main pathogen for both humans and animals. The symptoms of the disease range from a mild flu-like illness to a severe septicaemia, particularly in children the elderly and in the immunosupressed; infection during pregnancy can result in abortion, stillbirth or birth of a severely affected baby (1).

L. monocytogenes is a widely distributed bacteria in nature (2), so plants play an important role in its dissemination (3). This bacteria can reach humans either indirectly like ingesting milk from animals that had consumed contaminated food, directly in the form of contaminated foods, especially vegetables and dairy products (3).

Several listeriosis outbreaks have been associated to the consumption of raw vegetables, especially raw celery, tomatoes, lettuce, cabbage and coleslaw (4). Occurrence of *L. monocytogenes* in fresh salad vegetables has been reported in industrialized countries, however little is known about the incidence of this bacteria in this kind of food in other nations.

The aim of this study was to evaluate the

presence of *L. monocytogenes* in fresh salad vegetables sold in the metropolitan area of San José, Costa Rica.

MATERIAL AND METHODS.

A total of 50 samples of fresh salad vegetables, randomly acquired, was analyzed during August and September, 1997. 50% of the samples represented salads served as part of a popular dish known as "casado", the other 50% were prepackaged salads sold in the supermarkets. Samples were tested for the presence of *Listeria* spp. according to the methodology recommended by Vanderzant & Splittstoesser (5). Briefly, 25 g of each sample were transferred to 225 ml UVM broth (University of Vermont modified *Listeria* enrichment broth) and incubated for 22+/- 2 h at 30°C. After this, 1 ml was transferred to 10 mL Fraser broth and incubated at 37 °C for 24 +/- 2 h. After the enrichment, a loop was streaked on the surface of Oxford agar, incubated at 37 °C for 48 h and evaluated for the presence of typical *Listeria* colonies. These were confirmed by Henry illumination, morphology and Gram staining, motility, hemolysis properties, CAMP (Christie, Atkins and Munch-Peterson) behavior with *Staphylococcus aureus*, xylose and rhamnose utilization.

RESULTS.

Listeria was found in 32% (16/50) of the samples analyzed. From these, 20% (10/16) were *L. monocytogenes*, 8% (4/16) *L. welshimeri* and 4% (2/16) *L. murrayi*. 100% of the samples positive for *L. monocytogenes* had cabbage as the base vegetable.

DISCUSSION.

The incidence of *L. monocytogenes* in fresh vegetable salads is quite variable, it can be as low as 1.8% in North London (6), 4.5% in Switzerland

Listeria monocytogenes in fresh salad vegetables.

(7), or as high as 60% in the US (3). In spite of this variable pattern, fresh salad vegetables are becoming a matter of concern as a potential source of *L. monocytogenes* in human infections (8).

Even though in this study the presence of *L. monocytogenes* was not quantified, its mere presence in fresh salad vegetables constitutes a potential health risk, especially for immunocompromised individuals, including pregnant women and the elderly, since its infective dose has not yet been established and its ability to survive and grow in raw vegetables destined for human consumption has been widely and adequately demonstrated. *L. monocytogenes* is known to survive in plant vegetation for 10 to 12 years and it can reach populations of 10^5 to 10^7 CFU/g when stored at 4-15 °C respectively (3). Brackett (9) also reports that this organism has remained viable on Brussel sprouts dipped for 10 s in water containing 200 ug/ml chlorine.

Our results suggest the need for promoting changes in dietary habits for pregnant women and other immunosuppressed groups, especially when it is considered that the role of *L. monocytogenes* in raw vegetables is still not clearly understood. We recommend substituting the ingestion of raw vegetables for boiled ones, in which the thermic treatment destroys pathogenic microorganisms and also increases the presence of some nutritive elements as dietary fiber.

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