

OCCURRENCE OF *LISTERIA MONOCYTOGENES* IN SALAMI

Maria de Fatima Borges ^{1*}; Regina S. de Siqueira ²; Anna Maria Bittencourt²; Maria Cristina D. Vanetti³; Lúcio Alberto M. Gomide ⁴

¹Centro Nacional de Pesquisa de Agroindústria Tropical/EMBRAPA, Fortaleza, CE, Brasil. ²Centro Nacional de Pesquisa de Tecnologia Agroindustrial de Alimentos/EMBRAPA, Rio de Janeiro, RJ, Brasil. ³Departamento de Microbiologia and ⁴Departamento de Tecnologia de Alimentos, Universidade Federal de Viçosa, Viçosa, MG, Brasil.

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SHORT COMMUNICATION

ABSTRACT

Eighty-one samples of four different types of salami (Friolan, Hamburguese, Italian and Milanese), belonging to five brands, and purchased at Rio de Janeiro market, were evaluated for the occurrence of *Listeria monocytogenes*. The pathogen was detected in 13.3% of Italian type samples of salami, while *L. innocua* occurred in 6.5% of the Italian type and in 16.6% of the Milanese type. The remaining samples were negative for *Listeria* spp.

Key words: *Listeria*, meat products, salami

Listeriosis occurs mainly in immunocompromised individuals such as patients who depend on hemodialysis and prolonged therapies, AIDS patients, alcoholics, drug addicts and elderly, newborn and pregnant women (12, 18). The involvement of *L. monocytogenes* as an infecting agent, in these cases, has been related to the consumption of "in nature" and / or processed foods of vegetal and animal origins, such as milk (14, 17), cheese (5, 20), poultry (8, 17, 24), red meats (6, 13), meat products (5, 9, 23), vegetables and fruits (6, 11).

The incidence of *Listeria* in fresh meat may vary from 0 to 68%, while in processed meat products, including ready-to-eat food, the contamination ranges from 8 to 92% (13). However, a higher incidence of *L. innocua* in meat products, compared

to *L. monocytogenes* was reported (17). In salami, the occurrence of *L. monocytogenes* varies from 5 to 23% (6, 7). Salami do not undergo heat treatment and are fermented under variable temperatures (mostly between 25-30°C according to the processing method adopted by the manufacturer), having a final pH between 4.8 and 5.2, and water activity around 0.85-0.90 (3). The fermentation process is also variable and can be conducted by the meat natural flora or by the addition of lactic acid starter cultures. The characteristics of these products make them susceptible to the survival of *L. monocytogenes* and, therefore, there is a potential risk to the consumer's health. Despite the importance of *L. monocytogenes* in meat products, only few studies on the occurrence of this microorganism in fermented sausage

* Corresponding author. Mailing address: EMBRAPA-CNPAT - Rua Dra. Sara Mesquita, 2270, Planalto Pici. CEP: 60511-110, Fortaleza, CE, Brasil, Fax: (+5585) 299-1833. E-mail: fatima@cnpat.embrapa.br

manufactured in Brazil are available (5, 19). So far neither clinical cases nor outbreaks of listeriosis associated with the consumption of any food have been described (1, 16, 21). Therefore, the aim of this study was to verify the occurrence of *L. monocytogenes* and other species of *Listeria* in different types of salami sold at Rio de Janeiro retail market.

Three units of the same production batch of four types of salami (Friolan, Hamburguese, Italian and Milanese) from different commercial brands were collected at the retail market in the city of Rio de Janeiro. Commercial brands included five of the Italian type, two of Milanese type and one of Hamburguese and Friolan types. Each experiment was repeated three times, using samples from different production batches, in an overall total of eighty-one samples. Each sample was constituted by three sub-samples of 50 g, finely ground in a blender for two minutes. 25g of each sample were analyzed according to a modification of the method suggested by Mc Clain and Lee (15) and Van Netten *et al* (25), using PALCAM agar (Merck) instead of Lithium chloride-phenylethanol-moxalactam medium (LPM). The procedure included the following steps: primary enrichment (UVM I *Listeria* enrichment broth – Merck), secondary enrichment (UVM II *Listeria* enrichment broth – Merck), plating (PALCAM agar) and biochemical identification. In all steps, standard cultures of *L. monocytogenes* Scott A, *L. monocytogenes* ATCC 7644, *L. monocytogenes* ATCC 19111 and *L. innocua* L6A were used as controls.

One hundred and ten colonies with characteristics of the genus *Listeria* were recovered from PALCAM agar. After initial selection by the motility test, eighty isolates with umbrella-shaped motility were submitted to morphological and biochemical

characterization. In the carbohydrate fermentation tests, all cultures were able to use α -methyl-D-mannoside and rhamnose, with the production of acid, but they could not ferment xylose and mannitol. All eighty isolates presented positive and negative reactions to catalase and urea tests, respectively. Among these, sixty-seven were unable to reduce nitrate, as occurs in the *Listeria* genus. The sixty-seven isolates were further submitted to β -hemolysis, CAMP-Sa and CAMP-Re tests. According to the results, thirty isolates belonged to *Listeria* genus and twenty-three of them were identified as *L. innocua* and seven as *L. monocytogenes* (Table 1) .

The seven strains of *L. monocytogenes* were isolated from six samples of a single brand of Italian type salami, whereas the twenty-three strains of *L. innocua* were detected in six samples of two types of salami (Italian and Milanese) belonging to two different brands.

Therefore, 14.8% (12 out of 81) of the samples of salami were positive for *Listeria* spp. 50% of the positive sample (13.3% of Italian type samples) harbored *L. monocytogenes*, and 50% of them (6.5% of the Italian type and in 16.6% of the Milanese type) were positive for *L. innocua*.

The incidence of these microorganisms in similar meat products is quite diversified. Simón Serra *et al.* (22) observed an incidence of *L. innocua* of 14.3% of samples of raw-cured sausage while *L. monocytogenes* was not detected. Other authors, testing same kind of products, reported the occurrence of *L. monocytogenes* in 12.0% (2) to 17.5% of samples (4, 10).

L. monocytogenes was detected in a significant number of salami samples, indicating that it is important to monitor the presence of this pathogen in this type of meat product, specially because it is consumed without previous heat treatment.

Table 1. Biochemical profile of thirty isolates of *Listeria* spp.

Isolates	Biochemical profile								
	Mannitol	Rhamnose	Xylose	α -methyl-D mannoside	urea	nitrate	β -Hemolysis	CAMP-Sa ¹	CAMP-Re ²
1 to 5	-	+	-	+	-	-	+	+	-
6 to 7	-	+	-	+	-	-	+	+	+
8 to 30	-	+	-	+	-	-	-	-	-

¹CAMP test with *Staphylococcus aureus*

²CAMP test with *Rhodococcus equi*.

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RESUMO

Ocorrência de *Listeria monocytogenes* em salame

A ocorrência de *Listeria monocytogenes* foi avaliada em oitenta e uma amostras de quatro diferentes tipos de salame fermentados (Friolano, Hamburguês, Italiano e Milano), pertencentes a cinco marcas comerciais, adquiridas no mercado varejista da cidade do Rio de Janeiro. *L. monocytogenes* foi detectada em 13,3% das amostras de salame do tipo Italiano, enquanto que *L. innocua* ocorreu em 6,7% das mostras do tipo Italiano e 16,6% das amostras do tipo Milano. As demais amostras foram negativas para *Listeria* spp.

Palavras-chaves: *Listeria*, produtos cárneos, salame

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