

Occurrence of *Salmonella* in meat and meat products in Brazil.

R. Bromberg; Yamada, E.A.; Miyagusku, L.

Instituto de Tecnologia de Alimentos, Centro de Tecnologia de Carnes, Av. Brasil, 2880, CEP 13073-001, Campinas, S.P., Brazil.

Background

Contamination with *Salmonella* is common in all types of raw meats. The incidence varies according to agricultural practices and hygiene patterns during slaughtering and subsequent operations. Many experts agree that also the consumer education, implementation, and maintenance of adequate laboratory quality control programs can reduce the high numbers of food contaminated with *Salmonella*. The examination of various types of meat, and meat products can attest the incidence of this micro-organism in Brazilian slaughterhouses and meat-processing plants. The figures of this study can be helpful to prevent, eliminate, or reduce the incidence and level of this pathogen in meat, reducing the number of outbreaks of food poisoning resulting from the consumption of contaminated meat and meat products.

Objectives

The purpose of this study is to evaluate the incidence of *Salmonella* in various types of Brazilian meat, and meat products in a study carry out in slaughterhouses and meat-processing plants.

Methods

During the period 1994-2000, two thousand six hundred and thirty five samples of meat and meat products were examined for *Salmonella* presence. The products analysed were: chicken carcass, chicken cuts, fresh sausage, cubed meat skewer, Bologna sausage, Calabrian type sausage, Frankfurter sausage, Brazilian jerked-beef, and charqui. The samples were obtained from slaughterhouses and meat-processing plants in southeast and south regions of Brazil. The tests were performed according to Vanderzant and Splittstoesser (1992).

Results and Discussions

The numbers and types of products analysed for *Salmonella* sp. between 1994 and 2000 are shown in Table 1. The samples are arranged into 9 categories, indicating the occurrence and frequency of *Salmonella* sp. Among the 2635 samples examined 25 (0.95%) contained *Salmonella* sp. The incidence was highest in fresh sausage (2.67%), followed by chicken carcass (1.61%), raw chicken cuts (1.18%), cubed meat skewer (0.42%) and Brazilian jerked-beef samples (0.38%). None of the remaining four categories (Bologna sausage, Calabrian type sausage, Frankfurter sausage and charqui) of meat products presented samples contaminated with *Salmonella*.

According to the literature *Salmonella* is inevitably present in raw meat and thus in uncooked meat products (Varnam & Sutherland, 1995). The presence of this micro-organism in raw chicken carcasses or cuts, fresh sausage, Brazilian jerked-beef and cubed meat skewer is of serious concern considering the risk of contamination of other cooked food or due changes in the temperature occurred during storage.

Conclusions

Our investigations have indicated that *Salmonella* sp. is not widely distributed in meat and meat products produced in southeast and south regions of Brazil and that its presence was restricted to fresh or uncooked cured products.

Pertinent literature

Vanderzant, C. and Splittstoesser, D.F. **Compendium of methods for the microbiological examination of foods**. 3.ed. Washington, DC: American Public Health Association (APHA), 1992. 1919 p.

Varnam, A.H.; Sutherland, J.P. Meat and meat products: Technology, chemistry and microbiology. In: **Uncooked, comminuted and re-formed meat products**. London, Chapman & Hall, 1995. cap.3, p.121-166.

Data

Table 1. Presence of *Salmonella* sp. in meat and meat products obtained from slaughterhouses and meat-processing plants in southeast and south regions of Brazil.

Sample investigated	Number of samples	Samples positive for <i>Salmonella</i>	
		number	%
Chicken carcass	557	9	1.61
Chicken cuts	424	5	1.18
Cubed meat skewer	235	1	0.42
Fresh sausage	337	9	2.67
Frankfurter sausage	308	0	0
Calabrian type sausage	101	0	0
Bologna sausage	216	0	0
Charqui	197	0	0
Brazilian jerked-beef	260	1	0.38
Total	2635	25	0.95