

Occurrence Of *Salmonella* In Finishing Pigs In South Brazil

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Introduction

Salmonellosis is a worldwide problem and causes zoonotic disease. In recent years pork gained increasing attention as a source of human salmonellosis (1). Other countries have increased the studies on *Salmonella* prevalence in pigs since Denmark conduct a successful program to control *Salmonella* in swine (3).

In Brazil the most swine herds and abattoirs are concentrated in the south states, thus the pork industry has a great importance for the income of this region. Due to the importance of salmonellosis for the pig industry, a *Salmonella* surveillance program in South Brazil, based in serological and bacteriological examination, will be started in the near future. As a preliminary step to that, the present study was conducted to evaluate the occurrence of *Salmonella* in finishing pigs in South Brazil and to compare the isolation of *Salmonella* from feces and lymph nodes of the same animals.

Materials and Methods

Preliminary Screening: Ten finishing farms in Rio Grande do Sul state (Brazil) were selected. Each sampled farm had between 5 and 15 pens, each containing about 20 pigs. All farms used the all-in/all-out management. In each farm 10 pen samples were taken and submitted to *Salmonella* isolation protocol. Each sample were pre-enriched (37°C/18h) in buffered peptone water (25g/225ml) followed by selective growth in Rappaport-Vassiliadis broth (Merck, 42°C) and Muller-Kauffmann tetrathionate broth (Difco, 37°C). Aliquots of both media were plated on XLT4 (Difco) and Rambach (Merck) agars. Suspected isolates were submitted to biochemical identification and serotyping.

First trial: Two farms (A and B) with no isolation of *Salmonella* and a positive one (farm C) in the preliminary screening were chosen and feces from 25 randomly selected pigs in each of them were individually collected. The same animals were later sampled (rectal swab, intestinal content and mesenteric lymph nodes) at the slaughterhouse. Samples were processed as described above.

Second trial: After the introduction of new animals in the farm A and C, other 25 pigs in each farm were examined as described above.

Results and Discussion

Salmonella was isolated from pen samples of 3 (30%) of the 10 investigated farms. Two of this herds showed more than 7 pen samples positives of 10 collected, indicating high level contamination. Eight *Salmonella* serotypes (Agona, Bredeney, Lexington, London, Mbandaka, Panama, *Salmonella* sp. 5:h:-, Schwarzengrund) were found, with serotypes Agona and Bredeney being the most frequent. When individual animals were sampled, *Salmonella* were isolated in all chosen farms (A, B and C). The overall prevalence was 6.4% in feces collected on farm, 3.24% in intestinal contents and 5.6% in lymph nodes. *Salmonella* was not isolated from rectal swabs in both selective media. This result is in accordance with other relates (5) that rectal swabs are not suitable for isolation of *Salmonella* from carrier pigs. The isolation rate found in the sampled herds was similar to the prevalence reported in other countries (4, 6), but the serotype profile was different. *S. typhimurium*, the most found serotype in other countries, was not isolated. Interestingly, the most found serotype (*S.agona*) in the present study has been appointed as the main serotype isolated in human salmonellosis outbreaks associated to ingestion of meet (other than chicken) in Brazil (2).

In both individual sample collections conducted on farm C, one pig (1/25) was excreting *Salmonella* in feces. On farm A, the first trial resulted in 4 positive animals, but in the second trial no *Salmonella* was found in feces. The farm B showed 2 animals positive for *Salmonella* in the collected feces. The farm C (positive) showed a lower rate of carrier animals on farm compared to farms A and B, indicating that pen samples can fail in detecting positive herds. It could be done because the pen samples were collected shortly after the introduction of the animals in the farm, while the individual samples were taken at least two months later the preliminary screening. Thus, the animals could be contaminated at farm and started to excreting *Salmonella* at the end of the finishing period. Furthermore, farm A had a high level of positive animals in the first trial, but the new introduced animals were negative in the second trial, maybe due to a successful all-in/all-out management.

At slaughterhouse, no animal displayed *Salmonella*-positive results for both intestine content and mesenteric lymph nodes at the same time (Table 1). After these results, the estimation of the prevalence rate of carrier animals in a herd should not be done using samples of intestine content or mesenteric lymph nodes alone. Factors as kind and homogenization of samples, intermittent *Salmonella* fecal excretion and time after infection also affects the bacteriological detection of carrier animals (5).

Table 1: *Salmonella* isolation from rectal swab, intestinal content and lymph nodes taken from the same animals at the slaughterhouse

Farm ¹	Animal	Rectal swab	Intestinal content	Lymph nodes
A ²	1	Neg.	ND	<i>S. london</i>
	2	Neg.	ND	<i>S. agona</i>
	3	Neg.	ND	<i>S. tennessee</i>
	4	Neg.	ND	<i>S. london</i>
	5-25	Neg.	ND	Neg.
B ²	1	Neg.	<i>S. lexington</i>	Neg.
	2	Neg.	<i>S. lexington</i>	Neg.
	3-25	Neg.	Neg.	Neg.
C ²	1	Neg.	ND	<i>S. bredeney</i>
	2	Neg.	ND	<i>S. bredeney</i>
	3-25	Neg.	ND	Neg.
A ³	1-25	Neg.	Neg.	Neg.
C ³	1	Neg.	<i>S. london</i>	Neg.
	2	Neg.	<i>Salmonella</i> 5,h-	Neg.
	3	Neg.	Neg.	<i>S. agona</i>
	4-25	Neg.	Neg.	Neg.

1: negative (A, B) or positive (C) on preliminary screening, 2: first trial; 3: second trial; ND: not determined

None of the selective enrichment media was able to recover all isolated *Salmonella* strains. Muller-Kauffmann tetrathionate broth was efficient in the recovery of *Salmonella* of feces, but Rappaport-Vassiliadis broth showed better results in the isolation from lymph nodes (data not shown).

It was concluded that *Salmonella* serotype profile found in the Rio Grande do Sul State was different of that isolated elsewhere. Potentially pathogenic serotypes for human were present, emphasizing the importance of a *Salmonella* surveillance program in Brazil. For the bacteriological investigation, different kind of samples and more than one enrichment culture broth should be associated to achieve the best results.

References

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