Salmonella Typhimurium CARRIAGE at slaughter AFTER an enterocolitis outbreak in a swine herd

OLIVEIRA, C.J.B.¹, CARVALHO, L.F.O.S.², DOMINGUES JR., F.J.², FERNANDES, S.A.³, TAVECHIO, A.T.³

¹ Departamento de Patologia Animal, FCAV-UNESP, Via de acesso Prof. Paulo Donato Castellane s/n, km 5 - 18.884-900 - Jaboticabal-SP, Brazil. Phone: 5516 3209 263, E-mail: celso_bruno@hotmail.com. ² Departamento de Clínica e Cirurgia Veterinária, Faculdade de Ciências Agrárias e Veterinárias de Jaboticabal-UNESP, Brazil. ³ Instituto Adolfo Lutz, setor de Bacteriologia. Av. Dr. Arnaldo 355, 9 andar, Bairro Cerqueira César, POBox 7027, 01246-902, São Paulo-SP, Brazil.

Summary: The aim of this study was to estimate the prevalence of pigs carrying Salmonella Typhimurium after an enterocolitis outbreak in a commercial pig farm. A cross-sectional study was done during the slaughter of a batch of 86 animals. Mesenteric lymph nodes from 43 pigs were collected and pre-enriched in buffered peptone water (1:10) overnight at 37°C. Afterwards, aliquots of 1 mL and 0.1 mL were transferred to selenite-cystine and Rappaport-Vassiliadis broth, respectively. A loopful of each sample was streaked onto XLT4 and brilliant green agar plates, which were incubated at 37°C for 24 hours. Salmonella was cultured in 23 out of 43 collected samples (53.48%). Salmonella Typhimurium (13 strains) and Salmonella enterica subs. enterica 1,4,5,12:i:- (10 strains) were isolated. These results indicated that the slaughter of pigs from batches previously affected by enteric salmonellosis may represent a high risk for pork contamination, since there is an positive association between infected pigs before slaughter and carcass contamination.

Keywords: Carcass, Lymph nodes, Outbreak, Pigs, Pork

Introduction: In the last decades, the pattern of Salmonella serotypes involved in clinical salmonellosis in pigs has changed in some countries. There has been a continuous increase in the incidence of salmonellosis caused by non-adapted serotypes, such as Salmonella Typhimurium, compared to those caused by Salmonella Choleraesuis. Some reports have already shown the long-term shedding of Salmonella Typhimurium after experimental inoculation (Wood and Rose, 1992; Van Winsen et al., 2001). The aim of this study was to estimate the prevalence of pigs carrying Salmonella at slaughter, which were originated from a herd previously affected by an enterocolitis outbreak confirmed as salmonellosis.
Material and Methods: The prevalence estimation was determined by a cross-sectional study in animals originating from a herd that had shown clinical signs of enterocolitis. Salmonellosis was diagnosed by suggestive clinical signs (such as diarrhea in the growing and finishing phases, high morbidity/low mortality, weight loss-15 kg lighter at slaughter), pathological findings and isolation of Salmonella Typhimurium from feces and organs of affected animals. Clinical signs were controlled when gentamicin was included in the feed from 70 to 77 days and from 110 to 117 days. Sample size was estimated assuming an expected prevalence of 50%, which permitted an estimation of prevalence within 10% accuracy at the 95% confidence level. Mesenteric lymph nodes from 43 pigs were collected and pre-enriched in buffered peptone water (1:10) overnight at 37°C. Afterwards, aliquots of 1 mL and 0.1 mL were transferred to selenite-cystine broth and Rappaport-Vassiliadis broth, respectively. A loopful of each sample was streaked onto XLT4 and brilliant green agar plates, which were incubated at 37°C for 24 hours. Suspected salmonella colonies were transferred to triple-sugar-iron agar and lysine-iron agar slants. All strains presumptively identified as S. enterica were confirmed by slide agglutination test with poli-O and poli-H antiserum. All Salmonella isolates were serotyped as described by Popoff and Le Minor (1997).

Results: Salmonella enterica was cultured in 23 out of 43 collected samples (53.48%; 95% CI: 42.94:64.02%). Salmonella enterica serovar Typhimurium (13 strains) and Salmonella enterica subsp. enterica 1,4,5,12:i:- (10 strains) were identified. Although the phase reversal was not achieved in these 10 strains, the antigenic formula analysis indicate they are also Salmonella Typhimurium.

Discussion: Our results indicated that Salmonella Typhimurium can persist in mesenteric lymph nodes of slaughter-age pigs naturally infected in the farm during growing and finishing phases. These results are in accordance to previous data demonstrating long-term carriage of Salmonella Typhimurium after exposure (Wood and Rose, 1992). Considering that stress (particularly associated with transportation) may increase Salmonella shedding by infected animals, which might contribute to the spreading of the agent, we were unable to estimate the prevalence of infected animals on farm. Indeed, recent reports have demonstrated that slaughter-age pigs may become infected in a short period after placed in a contaminated environment (Hurd et al., 2001). As the cross-contamination of pork during slaughter is strongly linked to the prevalence of animals carrying Salmonella, these results showed that the slaughter of pigs from batches previously affected by salmonellosis may represent a risk-point for pork contamination.

Acknowledgements: This study was supported by Fundação de Amparo à Pesquisa do Estado de São Paulo – FAPESP, which provided grants (proc. 01/05098-1) and scholarship (proc. 01/05099-8).

References: