PREVALENCE OF *SALMONELLA* SPP. IN FINISHING SWINE IN CANADA.

LETELLIER, A.¹, MESSIER, S.¹, QUÉSSY, S.².

Meat and meat products play a major role in the transmission of some zoonotic diseases. Carriers animals are an important component in the epidemiology of *Salmonella*. These animals shed *Salmonella* and may contribute to contaminate environment, instruments and eventually meat in abattoirs. Given the failure of post-harvest measures to control these pathogens, efforts are now being made to control microbial pathogens at the farm-level. Nevertheless, evaluating farm-level control options requires knowledge of basic data such as prevalence and distribution of pathogens in animals and herds. This study was conducted to evaluate the prevalence of *Salmonella* spp. in finishing swine at slaughterhouses in Canada and to evaluate the distribution of this pathogen among different herds.

METHOD

*Collection of samples.* All samples were obtained from finishing pigs slaughtered between June 1995 and April 1996 in abattoirs in Quebec (4), Ontario (1) and Manitoba (1). A total of 1420 samples were randomly selected on healthy five-month old pigs which were distributed among 223 producers. Immediately after evisceration and inspection, a small incision was aseptically done in the mid third of the caecum, using a disinfected scalpel and one-gram caecal content samples were collected from each animal, with a sterile wood stick. The tattoo number of each sampled animal was noted.

*Isolation and identification of Salmonella* spp. One gram of feces was added to a tube containing 9 mL nutrient broth (Difco, Detroit, MI) and incubated for 18-24 h at 37°C. One mL of nutrient broth of each specimen submitted to the primary enrichment was inoculated into 9 mL of two different broth media for the selective enrichment of *Salmonella* spp. Tetrathionate brilliant green (BBL, Cockeysville, MD) and Rappaport-Vassiliadis (Oxoid, Hampshire, England) and incubated for 48 h at 37°C. Then, one loopful (10μL) of each selective enrichment media was inoculated onto a BGS agar (brilliant green sulfa agar (Difco) containing novobiocin (Sigma Chemical Co., St-Louis, MO) at 20μg/mL) and incubated for 24 h at 37°C. Lactose negative colonies were submitted to biochemical testing by urease and Triple sugar iron media (Difco). Colonies typically corresponding to *Salmonella* spp. were tested by agglutination against polyvalent O-antisera (Poly A1-Vi, Difco) and *Salmonella* isolates were serotyped at the Agriculture and Agrifood Canada Laboratory in Guelph, under the supervision of Dr. C. Poppe.

RESULTS

¹ University of Montreal, 3200 Sicotte, St-Hyacinthe, Quebec;
² Health Canada, Health of Animal and Food Laboratory, 3400 Casavant west, St-Hyacinthe, Quebec, Canada.
The prevalence of *Salmonella* spp. in the population of finishing pigs was evaluated (with a 95% confidence interval) at 5.2 ± 1.2%. A total of twelve (12) serotypes were identified. The most frequently isolated serotypes were *S.brandenburg* (41.0%), *S.infantis* (16.4%), *S.derby* (9.8%), *S.typhimurium* (8.2%), *S.Scharzengrund* (4.9%) and *S. urbana* (4.9%). The frequency distribution of herd-level *Salmonella* infection in finishing pigs was calculated using herds where at least 5 samples were collected (Table 2). A herd positive for *Salmonella* spp. was definite as one positive sample in a herd concludes that herd is positive. *Salmonella* spp. was present in 26.2% of those producers (n≥5). The frequency distribution of *Salmonella* spp. among herds showed that the higher prevalence was in the 10-20% interval (for 13.1% of the producers). Two different selective media were used for the isolation of *Salmonella* spp., Rappaport-Vassiliadis and Tetrathionate Brilliant Green broth, and these media showed similar efficiency (data not shown).

Table 1: Prevalence of *Salmonella* spp. (with a 95% confidence interval) in the total population (N=1420 from 223 herds) and in animals from selected producers (N= 1169 from 107 herds).

<table>
<thead>
<tr>
<th>Pathogen producers</th>
<th>Prevalence in population</th>
<th>Prevalence in pigs from selected producers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(No. of isolates)</td>
<td>(No. of isolates)</td>
</tr>
<tr>
<td><em>Salmonella</em> spp.</td>
<td>5.2 ± 1.2 % (74)</td>
<td>5.2 ± 1.3 % (61)</td>
</tr>
</tbody>
</table>

Table 2: Frequency distribution of *Salmonella* spp. at the herd-level in finishing pigs for selected producers.

<table>
<thead>
<tr>
<th>Intervals of prevalence of <em>Salmonella</em> spp. (%)</th>
<th>0</th>
<th>0-10</th>
<th>10-20</th>
<th>20-30</th>
<th>30-40</th>
<th>40-50</th>
<th>50-60</th>
<th>60-70</th>
<th>70-80</th>
<th>80-90</th>
<th>90-100</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of producers</td>
<td>73.8</td>
<td>6.5</td>
<td>13.1</td>
<td>0.9</td>
<td>1.9</td>
<td>0.9</td>
<td>0.9</td>
<td>0.9</td>
<td>1.9</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
CONCLUSION

The prevalence of Salmonella spp. in finishing swine in Canada is comparable to the prevalence reported in other countries (Fedorka-Cray and Bugh, 1996, Yoshida et al., 1995, Christensen and Baggesen, 1996). The serotypes most often found in Canada are generally among those most prevalent in the United States and Europe, (Fedorka-Cray and Bugh, 1996, Christensen and Baggesen, 1996) but significant differences were also noted particularly concerning the prevalence of the different serotypes in the population. For instance, S. enteritidis was not found and S. infantis is a serotype regularly isolated in Canada. The prevalence of Salmonella in selected producers (n≥5) indicates that most herds would be free or with low levels of Salmonella spp. Most of the positive herds showed a prevalence under 20% and only animals from few producers (2.8%) showed carriage rates higher than 50%. Extensive environmental and animal sampling is now being performed in these herds in order to gather epidemiological data concerning sources of infection by Salmonella.

REFERENCES

