negative status for *Salmonella*, we were interested in this study to determine if it was possible to develop a protocol that would allow the population of a negative farrowing unit by use of animals from a herd known to be moderately contaminated by *Salmonella*. Since serology can not detect recently infected animals and since bacteriology can not detect most healthy carriers, we used a combination of serology and bacteriology, ensuring that the last sampling was done after the stress period caused by the selection process.

In the first part of this study, we observed that all sampled animals from NP/NS pens were negative after introduction in the new farrowing unit. Interestingly, it was also possible to populate an almost negative section of the new unit by use of PP/NS animals. To do so, few basic measures were applied to these animals such as a Neomycin treatment in water and the washing of gilts at their arrival to the new unit. In addition, few special precautions such as maintenance of the integrity of pens and biosecurity measures such as changing/washing boots between positive and negative pens, were applied throughout the experiment.

**Conclusions:** Results obtained in this study demonstrated that it is possible to populate a swine herd with animals negative to *Salmonella* coming from a positive herd by selecting animal using bacteriology and serology combined with application of biosecurity and prophylactic measures. Further studies will be possible on seronegative gilts from positive pens, to investigate their possible resistance to *Salmonella* infection.

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**Field trials to evaluate the efficacy of mash feed to reduce *Salmonella* shedding in swine**

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**Summary:** The objective of this study was to evaluate the effect of corn based mash feed as a pre-harvest intervention strategy to reduce shedding in pigs herds contaminated by *Salmonella* spp. In this study, three nurseries previously found contaminated by *Salmonella* in successive production cycles were selected to evaluate the effect of mash feed. Pelleted feed was administered for the first part of the experiment and mash feed was then introduced in all herds for a period of four production cycles. Samples from pens were cultured to evaluate the prevalence of *Salmonella* in each production cycle. A total of 195 samples for the period corresponding to pelleted feeding and 68 samples for the period corresponding to mash feed were collected. Results indicated a significant reduction of *Salmonella* shedding in herds following mash feed utilization.
Keywords: pelleted, biosecurity, grinding, excretion, incoming animals

Introduction: Among the recognized source and/or risk factors associated with *Salmonella*, presence of rodents, ineffective washing and disinfection protocols, multiple sources of incoming animals and lack in biosecurity are often observed (Quessy et al., 1999). Feed can also be a source of contamination of pig herds. Pelleting of feed was, and is still, considered as a good tool to destroy *Salmonella* when a significant contamination of incomings is known or suspected to be contaminated with *Salmonella*. However, as an adjunct effect, it kills most of the microflora that may help to protect animals if they are exposed to *Salmonella* within the farm environment (Israelson et al., 1996; Heidenrich and Löwe, 1994). Many studies reported that feed formulation can influence the outcome of the infection in pigs. The objective of this study was to evaluate the efficacy of mash feed as a pre-harvest intervention to reduce shedding in pigs in herds contaminated by *Salmonella* spp.

Materials and methods: Three nurseries, previously found positive to *Salmonella* by bacteriological culture, were followed during successive production cycles in this field study. Corn-based pelleted feed was first given to piglets during 8 production cycles and mash feed (1100 _m) was then introduced in all herds for a period of four production cycles. Pooled 5 g samples of feces from pens (n=8) were analysed in every farm to evaluate the prevalence of *Salmonella* in each production cycle. A total of 195 samples were cultured by conventional enrichment and culture procedures for the pelleted feed period and 68 samples during mash feed administration. Briefly, fecal samples were homogenized in 45 mL of nutrient broth (NB) and incubated 18 h at 37°C. One mL of NB of each specimen in the primary enrichment was transferred to 9 mL of tetrathionate brilliant green and incubated for 24 h at 37°C, for selective enrichment of *Salmonella* spp. Then, one loopful (10 mL) of the selective enrichment media was inoculated in brilliant green sulfa agar (BGS) containing novobiocin at 20 mg/mL and incubated for 24 to 48 h at 37°C. Lactose-negative colonies were tested biochemically on urea and triple sugar iron slants. Colonies with reactions characteristic of *Salmonella* spp. were tested by agglutination with a polyvalent O-antisera (Poly A1-Vi) and Salmonella isolates were serotyped at the Office International des Épizoties (OlÉ) Salmonella Reference Laboratory, Health Canada in Guelph, Ontario. No modification was done in the management of herds and sources of incoming animals were not changed during the experiment. No specific therapeutic treatment was administrated to these herds during the experiment.

Results: Results indicated that 64% of samples taken during the pelleted feed period were positive for *Salmonella* while 21% of positive samples were found during the mash feed period (table 1). The analysis of data indicated a significant reduction of *Salmonella* shedding in these herds under the mash feed period. A one-tailed Fisher’s exact test was used (α=0.05).

Table 1. Comparison of *Salmonella* prevalence in pens for pelleted or mash feed period.

<table>
<thead>
<tr>
<th></th>
<th>Pelleted feed period</th>
<th>Mash feed period</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>No of collected</td>
<td>Percentage of</td>
</tr>
<tr>
<td></td>
<td>samples</td>
<td>positive pens</td>
</tr>
<tr>
<td>Farm</td>
<td>10 of collected</td>
<td>72%</td>
</tr>
<tr>
<td></td>
<td>samples</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>68</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>64</td>
</tr>
<tr>
<td>total</td>
<td>195</td>
<td>64%</td>
</tr>
</tbody>
</table>

Discussion: In the current field situation, even with application strict biosecurity measures and HACCP-based programs, the periodical introduction of healthy carriers positive to *Salmonella* is difficult to avoid. It is thus necessary to take appropriate actions to reduce shedding of contaminated animals when herds are found to be significantly contaminated by this bacterium. Results obtained
in this study indicated that use of mash feed in younger animals may help to significantly reduce the shedding of *Salmonella* in contaminated nurseries. While the exact mechanism associated with this protection is unclear some authors suggested that the microflora of non-pelleted feed act by competitive exclusion. The coarse grinding (1100 μm) was also found important in the current study to reduce the shedding of *Salmonella*. Use of mash feed can thus be considered as an interesting measure that can be part of a comprehensive plan to control *Salmonella* in swine farms.

**Conclusions:** Research are currently conducted to assess the efficacy, in field conditions, of mashed feed in older animals and to understand how the size of feed particles can affect the shedding of *Salmonella*.

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**Pilot experiment with the aim to reduce salmonella prevalence in pork by logistic slaughter of pigs**

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**Summary:** A pilot experiment was carried out with the aim to evaluate the possibilities and results of logistic slaughter of pigs (separate slaughter of salmonella-free and salmonella-infected pig herds) under usual circumstances in a Dutch slaughterhouse. During the experiment salmonella-free herds were delivered and slaughtered on Tuesday mornings. Herds delivered on Thursday mornings served as a control group. No significant difference could be found in the number of salmonella-positive herds.