Salmonella prevalence in different poultry rearing systems: preliminary results.

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Introduction

Salmonella is an intestinal bacterium that can be transmitted by animals and broiler chickens are widely accepted as an important reservoir of Salmonella (Limawongpranee et al., 1999). Many consumers assume that the organic chickens shed less Salmonella than the broilers because of the particular system management (low density, access to outside and special diets) (Bayley and Cosby, 2005).

Despite these perceptions there is a lack of published information about the microbiological status of organic chickens.

The objective of this study was to evaluate the effects of the rearing system (conventional vs. organic) on the Salmonella prevalence.

Material and methods

The investigations were performed in 8 different farms (4 organic and 4 conventional). The number of birds for each farm is specified in Table 1. During the production cycle environmental samples consisting of 5 pools of litter, 2 pools of dust and 1 water samples were collected. At slaughterhouse 60 caecal samples per farm, subdivided in 2 pools, were also collected. All samples were analyzed with traditional bacteriological methods. Salmonella, identified as Salmonella Hadar, by agglutination test with polyvalent sera, was isolated in caecal samples coming respectively from 1 conventional and 1 organic farm. Samples of litter, dust and water were all negative, in relation likely to a low microbial environmental concentration. Further investigations are necessary in order to draw definitive conclusions.

Keywords: Salmonella; poultry; organic farm; conventional farm
followed by adding 225 ml of BPW. The samples were incubated at 35 ± 2°C for 20-24 h, and then 1 ± 0.1 ml was transferred into 10 ml Muller-Kauffmann Tetrathionate Novobiocin broth (MKTTn) broth and 0.1 ± 0.02 ml was transferred into 10 ml Rappaport Vassiliadis Broth (RV) broth. The tubes were incubated in a water bath at 42 ± 0.5°C for 18-24 h.

The subcultures from the enrichment media were made onto Xylose Lysine Desoxycholate (XLD) agar plates and on Hectoen enteric agar plates and then incubated aerobically at 37°C for 20-24 hours. One loopful of inoculum was used for each plate.

Presumptive colonies were inoculated onto Macconkey agar, incubated at 37°C for 24h and biochemically checked with Ureum Agar (UA), Triple Sugar Iron Agar (TSI) and using commercial tests (API 20E). Identification was performed by agglutination testing with polyvalent sera.

**Results and discussion**

The results are showed in Table 1. *Salmonella* spp. was twice isolated either in conventional or in organic farm. It was successively identified as *Salmonella* Hadar.

**Tab 1.** *Salmonella* prevalence in conventional and organic farms

<table>
<thead>
<tr>
<th>Farm</th>
<th>Samples (litter, dust, and water)</th>
<th>Caecum samples</th>
</tr>
</thead>
<tbody>
<tr>
<td>A)Conv. (20,000 birds)</td>
<td>neg.</td>
<td>neg.</td>
</tr>
<tr>
<td>B)Conv. (32,000 birds)</td>
<td>neg.</td>
<td>neg.</td>
</tr>
<tr>
<td>C)Conv. (25,000 birds)</td>
<td>neg.</td>
<td>neg.</td>
</tr>
<tr>
<td>D)Conv. (32,000 birds)</td>
<td>neg.</td>
<td>pos*</td>
</tr>
<tr>
<td>A)Organic (4800 birds)</td>
<td>neg.</td>
<td>pos*</td>
</tr>
<tr>
<td>B)Organic (3500 birds)</td>
<td>neg.</td>
<td>neg.</td>
</tr>
<tr>
<td>C)Organic (3500 birds)</td>
<td>neg.</td>
<td>neg.</td>
</tr>
<tr>
<td>D)Organic (4000 birds)</td>
<td>neg.</td>
<td>neg.</td>
</tr>
</tbody>
</table>

* *Salmonella* Hadar

With respect to the organic farm the scarce *Salmonella* prevalence could be explained by a general improvement of management conditions addressed to optimise the animal welfare. Bailey and Cosby (2005) do not agree in assuming that the free range or organic conditions can influence the *Salmonella* status in the chickens.

In our investigation, though preliminary, *Salmonella* was not common in conventional farm as well in organic ones. These results can be explained by a possible antibiotic use, frequently observed in intense operative practicies, especially in the first period of production. However, it has to underline that in the last years the incidence of *Salmonella* infection has declined all over the world (Carraminana et al., 1997; Limawongprarnee et al., 1999). The isolation of *Salmonella* Hadar confirmed the large worldwide diffusion of this serotype, likely due to its resistance to fluoroquinolones (Threlfall et al., 1997; Breuil et al., 2000; Tran et al., 2004).

**Aknowledgements:** authors thank Maurizio Marchetti for technical support. This work was supported by fund granted by Poultryflrgut contract. Food-CT-200X-007076

**References**


