German guidelines for the reduction of salmonella prevalence in fattening pigs

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Introduction

In order to determine the prevalence of Salmonella spp. in German slaughter pigs, a pilot study was initiated. A comparison of the traditional bacteriological and serological techniques described by Nielsen et al. (1), used in the Danish Salmonella control program, was included in this interlaboratory study.

The pilot study gave an overview of the Salmonella situation in German slaughter pigs (2).

The overall prevalence rates detected are comparable to those reported in finishing swine from other Member States. About 5% of the lots yielded a high contamination rate.

Serology proved to be a suitable technique to be used in the context of a continuous monitoring program. Its main advantages are the low price of testing and the easy accessibility and handling of the samples. Furthermore, this method permits the detection of herds with a history of Salmonella infection, which is considered to be particularly advantageous in the framework of a control program.

Based on the results of the pilot study, Germany is carrying out a surveillance and control program involving all stakeholders (federal and regional governments, scientific and industrial organizations). The participation of individual production units in the scheme is voluntary.

Materials and Methods

With its strategies for the reduction of salmonella prevalence in fattening pigs Germany aims to monitor the salmonella situation in farms. This way, herds can be grouped into different categories, and those found to have a low contamination rate will be marketed preferentially.

Furthermore, the results of the monitoring program can also be used to set up specific control measures in the individual herd and hence to reduce the introduction of salmonella into the slaughterline by using a serological method (3). To make sure results are comparable throughout the scheme, the guidelines must include a standardized sampling plan (4). The results are intended to facilitate classifying farms in a "salmonella-controlled"-scheme, depending on their salmonella prevalence.

Where necessary, improvement of the salmonella situation on farms must be achieved mainly by utilizing market forces. This is supposed to lead to a reduction of salmonella introduction into slaughterhouses and, consequently, to reducing the salmonella contamination rate of pork. Therefore the overall aim is to minimize the risk of salmonella introduction during meat processing, which will be a major contribution to improving public health.

Results

Following an agreement between all parties involved, i.e. government, scientific and industrial organizations (s.o.), the program was officially approved in March 1998 (5):

- The participation of individual production units in the scheme is voluntary. It is hoped that the promising results of the pilot investigation - 70% of the lots were found to be serologically negative - function as an incentive for the majority of those producers who have agreed to participate in the self-control scheme and to increase/step up their efforts to maintain or to improve the registered Salmonella status of their unit. Veterinary health services and relevant organizations will support these endeavors.

In order to make sure results are comparable throughout the scheme, the guidelines include a standardized sampling plan (Table 1).

Furthermore, the German guidelines provide for a standardized diagnostic technique. The meat juice ELISA will be used as the standard method for identifying and classifying the Salmonella status of fattening units in the whole of Germany. As standardized diagnostic tests were not commercially available when the program started, the supply of in vitro diagnostics (antigen, reference sera) is presently ensured by governmental sources.
Only laboratories approved for diagnostic procedures are involved in the testing. The practical investigations and the documentation of results in databases will be carried out by only a few centers in the Federal Republic for several Länder at a time. Establishing the system within a period of 18 to 24 months is considered feasible. Permanent control and feedback through interlaboratory studies will ensure the high quality of the data. Furthermore, the evaluation of results will follow strictly standardized procedures.

All data will be collected and analyzed in a central government institution. All participating finishing herds will be put into one of three categories, according to the results of data analysis during a one-year period.

The program will be put into force in a two-step-approach:

During the first step, i.e. the "preparatory period", which is scheduled to last for at least one or two years, the infrastructures will be established, involving slaughterhouses, farmers, laboratories, veterinarians and government institutions. This will include working out and organizing the logistics details. To facilitate the collection of information about participating herds a database will be established.

The second step, or "evaluation period", will include evaluation and the classification of farms in three different categories, a task to be carried out by government institutions on the basis of the results of participation during the one-year program, as given in Table 2. The status of a "salmonellenüberwachter Betrieb" (Salmonella-controlled farm) can be given to any farm fulfilling the following conditions: firstly, participation in the program, secondly, fulfillment of the sampling plan requirements and thirdly, successful categorization according to data analysis.

For herds categorized under level II, there will be a compulsory consultation on improving the individual situation.

Compulsory control measures must be taken for Category III herds.

At the moment (May 1999) more than 2400 fattening farms and 27 abattoirs are involved in the preparatory period. Since its start about 25 000 samples have been taken.

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**Table 1: Sampling plan according to herd size**

<table>
<thead>
<tr>
<th>Number of animals for slaughter per year</th>
<th>Number of annual samples to be taken</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 45</td>
<td>all animals must be sampled</td>
</tr>
<tr>
<td>Up to 100</td>
<td>45 samples</td>
</tr>
<tr>
<td>100 to 200</td>
<td>50 samples</td>
</tr>
<tr>
<td>More than 200</td>
<td>60 samples</td>
</tr>
<tr>
<td>Samples to be equally spread over the year</td>
<td></td>
</tr>
</tbody>
</table>

**Table 2: Categories for classification of farms and measures to be taken**

<table>
<thead>
<tr>
<th>Category</th>
<th>Prevalence in the herd</th>
<th>Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Less than 20 %</td>
<td>None</td>
</tr>
<tr>
<td>II</td>
<td>20 to 40 %</td>
<td>Consultation of a veterinarian;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>establishment of control measures optional</td>
</tr>
<tr>
<td>III</td>
<td>More than 40 %</td>
<td>Establishment of control measures under veterinary supervision</td>
</tr>
</tbody>
</table>
References


2. Rabsch, W., A. Käsbörer, L. Geue, R. Helmuth, Th. Blaha and D. Protz: Occurrence of Salmonella typhimurium in German slaughter pigs. 4th World Congress - Foodborne Infections and Intoxications, 7 - 12 June 1998, Berlin, Germany

