Serological *Salmonella* surveillance in Styrian swine herds

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**Abstract:** Styria has implemented a *Salmonella* surveillance programme in pork production based on the serological monitoring of pig herds. 10,000 blood samples of slaughter pigs from 1000 farms were investigated in 1999, and 7040 samples from 704 farms in 2000. Samples were analysed using the SALMOTYPE⁷ Meat Juice ELISA of Labor Diagnostik, Leipzig. In 1999, 95.5 % of the herds tested negative, 4.2 % were suspected to be positive and 0.3 % produced positive results, i.e. exceeded the “cut-off” value of 40 %, while the respective results for 2000 were 93.5 %, 6.3 % and 0.3 %. The low prevalence of seropositive results is confirmed by the results of bacteriological examinations in meat cutting facilities.

**Keywords:** Screening, pigs, pathogens, serology, meat juice

**Introduction:** The implementation of Directive 92/117/EEC (“Zoonoses Directive”), which requires measures to be taken for the control of “food-borne diseases”, resulted in the setting up of a Salmonella surveillance programme for pork production in Styria (Köfer et al., 2000). The Styrian system is similar to the Danish *Salmonella* surveillance and control programme (Mousing et al., 1997). After bacteriological Salmonella screening, comprising determination of serovars and resistance patterns, a serological monitoring programme and a bacteriological monitoring of pork in cutting plants were implemented (Pless et al., 2000).

**Material and Methods:** In our monitoring programme, we tested a total of 1000 stocks with at least 10,000 animals in 1999 and 704 stocks with at least 7040 animals in 2000 on the basis of a representative sampling plan (Fuchs et al., 1999). Slaughterhouses were chosen with probability proportional to the estimated number of pigs slaughtered. The serological herd monitoring scheme makes use of the SALMOTYPE⁷-ELISA, a test kit based on the so-called Danish mix ELISA test (LPS antigens 0:1, 4, 5, 6, 7, 12), licensed and commercially available from Labor Diagnostik (Leipzig). The “cut off value” (more than 40 % serum titre of antibodies against Salmonella for positive and >20≤40 % for suspected samples) was specified according to the guidelines for a programme aimed at reducing Salmonella transmission into meat production by way of slaughter pigs as defined by the German Federal Ministry for Food, Agriculture and Forestry. The
SALMOTYPE™-ELISA is calibrated to the Danish ELISA to make international comparison possible (Gabert, 2001).

**Results:** In 1999, 95.5% of the herds tested negative (level 1), 4.2% were suspected to be positive (level 2) and 0.3% (= 3 farms) produced positive results (level 3) (Fig. 1). In 2000, 93.5% of the herds tested negative (level 1), 6.3% were suspected to be positive (level 2) and 0.3% (= 2 farms) produced positive results (level 3). According to these test results, stocks are classified into three levels (1, 2 or 3). When a herd is classified as level 2 or 3 (moderate or high sero-prevalence) a follow-up programme with epidemiological investigations is carried out.

![Box plot](image)

**Figure 1:** Salmonella herd serology – Meat Juice ELISA monitoring 1999 and 2000

**Legend:**
- N = number of farms investigated
- A – F = slaughterhouses

**Discussion:** The meat juice samples from the 1704 stocks tested during the reporting period using the SALMOTYPE™-ELISA produced satisfactory results. A total of 5 farms were assigned to level 3 (OD > 40%), which corresponds to a relative frequency of 0.3%. The share of fattening farms whose results were
suspected to be positive (OD > 20 ≤ 40) increased from 4.2 % (= 42 farms) in 1999 to 6.3 % (= 44 farms) in 2000, but has no statistical significance. This result is comparable to the frequencies recently determined in Denmark (Anonymous, 2000). In our study only the share of level 2 farms is nearly twice as high as in Denmark. Epidemiological investigations in level 2 and 3 farms in most cases revealed a connection with poultry production. Bacteriological examinations of pork performed in the same period of time corroborated the serological results (Pless, 2001).

**Conclusions:** The results have shown the Salmonella contamination in pig herds and also in cut meat to be relatively low. An extension of the monitoring programme to all swine farms seems not to be necessary at present.

**References**


