Tuberculous lesions in pigs in the Czech Republic in the years 1990-1999

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Summary: In the Czech Republic, bovine tuberculosis in cattle was controlled in 1968. The last outbreak was diagnosed in cattle and domestic pigs in 1995. During the veterinary hygiene inspection of pigs slaughtered in slaughterhouses, however, tuberculous lesions were still being found above all in the head and intestinal lymph nodes. In the decade monitored a total of 45 873 318 pigs were slaughtered and examined according to veterinary hygiene standards. Apart from 1991, when results of tuberculous findings were not obtained, tuberculous lesions were found in 134 088 (0.32%) of the 41 458 565 pigs examined in the remaining nine years. During a detailed analysis of the pathological anatomical examination of 190 940 pigs slaughtered in one district, tuberculous lesions in lymph nodes were found in 4 107 (2.2%) pigs: mesenteric (65.3% pigs), submandibular (18.6% pigs), inguinal (0.1% pigs) and simultaneously intestinal and head lymph nodes (15.9% pigs). Miliary tuberculosis was found only in the parenchymatous organs of four (0.1%) pigs. The following financial losses resulted: 6% for confiscating the head, intestines and stomach, and 22 to 24% for assessing meat as conditionally edible after processing, i.e. intended only for heat-processed products. Mycobacteria were isolated from 7 246 (41.8%) pigs through the cultivation of tissue samples from 17 326 pigs. Mycobacterium bovis was detected in only five (0.07%) animals which originated from the last outbreak of bovine tuberculosis in cattle in the Czech Republic in 1995. M. avium complex (MAC) isolates came from 6 870 (94.8%) animals: 55.7% M. a. avium isolates were mainly of serotypes 2 and 3 and genotype IS901+ and IS1245+ and 39.2% M. a. hominissuis isolates were mainly of serotypes 4, 8 and 9 and genotype IS901- and IS1245+. Conditionally pathogenic mycobacteria (M. chelonae, M. terrae, M. phlei and M. fortuium) were isolated from 371 (5.1%) pigs. In the whole period monitored, two marked increases in the findings of tuberculous lesions were recorded: In the mid-1990s as a result of using deep bedding with wood shavings and at the end of the 1990s as a result of supplementing the pigs’ feed with peat.

Keywords: meat inspection, mycobacteriosis, pig carcasses, risk assessment, PCR

Introduction: In the Czech Republic, bovine tuberculosis was controlled in cattle and other domestic animals in 1968 (Polak, 1969). The last infection caused by Mycobacterium bovis in domestic pigs was diagnosed in 1995 (Pavlik et al., 2002). During the veterinary hygiene inspection of pigs slaughtered in slaughterhouses, however, tuberculous lesions were still being found. Pig breeders of animals affected in this way suffered major economic losses (Pavlik et al., 2003). From pig lymph nodes with tuberculous lesions were isolated not only Mycobacterium avium (MAC) complex members but less commonly Rhodococcus equi (Dvorska et al., 1999). The objectives of this work were the assessment for tuberculosis lesions of all pigs slaughtered in the Czech Republic during the years 1990-199 and the analysis of tissue cultures from pigs.

Materials and Methods: Between 1990 and 1999, when a total of 45 873 318 pigs were slaughtered in slaughterhouses in the Czech Republic, biological material was collected from 17 326 (0.04%) pigs for laboratory examination. Tissue samples were supplied to the laboratory immediately after collection, or were frozen and delivered in this condition no more than one month later for laboratory examination described previously (Fischer et al., 2000). Mycobacterial isolates were identified using biochemical
method (Wayne and Kubica, 1986), the Accu-Probe Probe (Accu-Probe Inc., San Diego, Calif.) system, PCR for the detection of IS901 (Kunze et al., 1992) and IS1245 (Guerrero et al., 1995). MAC isolates were also identified by serotyping (Wolinsky and Schaefer, 1973) and biological experiment on pullets (Pavlik et al., 2000). R. equi isolates were identified according described methodology (Dvorska et al., 1999).


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**Genetic relatedness of Salmonella enterica isolates from pens and swine at slaughter**

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**Keywords**: food safety, zoonosis, abattoir, lairage, PFGE

**Summary**: The study aimed to determine if Salmonella enterica isolates from the floor of pre-slaughter holding pens were genetically related to isolates found in swine, held in those pens, post-slaughter. Pulsed-field gel electrophoresis (PFGE) typing was used to determine genetic relatedness. On seven occasions, 100% homologous PFGE patterns were found, i.e. the pen and pig isolates were identical. This suggested that pen to pig transfer of Salmonella enterica occurred. Isolates from PFGE patterns associated with pig to pen transfers were more likely to occur in the S. Anatum, S. Heidelberg and S. Typhimurium serotypes. The ability of an isolate from a pen to rapidly infect animals housed in the pen may vary within serotype based on factors described by the PFGE pattern. This may explain why some S. enterica serotypes are prevalent in swine but not in pork products or humans.

**Introduction**: In a study examining samples collected from the holding pen prior to pigs entry and then from the gastrointestinal tract of swine after slaughter Rostagno et al.(2003) observed that 26% of swine S. enterica isolates were the same serotype as found in the pens. This finding, and others, suggest that the holding pen in abattoirs is a significant source of Salmonella enterica in swine entering the slaughter floor (Hurd et al. 2001;McKean et al. 2001;Rostagno et al. 2001). However, similarities in serotype are only suggestive that isolates are related. Therefore, a study was conducted to determine the genetic relatedness, as determined by PFGE, of isolates of the same serovar found in the pre-slaughter holding pen and the pigs at slaughter.