Tracing back multi-resistant Salmonella Typhimurium DT 104 from pork at the slaughterhouse to a specific swine herd by strategical use of serology and culture

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Abstract

Multi-resistant Salmonella Typhimurium DT104 (DT104) was first isolated from Danish livestock in 1996. DT104 is now known as an important and emerging pathogen in many countries.

In Denmark, multi-resistant Salmonella Typhimurium DT104 is officially declared an unwanted bacteria in any food. Consequently, when DT 104 is detected in pork at a Danish slaughterhouse, all carcasses from the day of slaughter in question must be heat treated. In order to find DT 104 infected swine herds, a mandatory tracing back procedure is performed by strategical use of serology and culture.

This paper presents the results from a mandatory tracing back situation, where 677 herds had delivered pig for slaughter a particular day. By strategical use of serology the herds were examined by culture if seropositive samples were found during the last 3 month. Seronegative herds were sample with twice the intensity for a month in order to find seropositive pigs. In total 111 herds of the original 677 herds were examined, and 1 DT 104 positive herd was detected.

Introduction

Multi-resistant Salmonella Typhimurium DT104 (DT104) was first isolated in United Kingdom in the 1980s. DT104 was isolated in Denmark for the first time in 1996 (1). Retrospective analysis of isolates detected DT104 in a Danish swine herd in 1991. The majority of the Danish isolates are characterized by being resistant to 5 frequently used antibiotics; ampicillin, chloramphenicol, streptomycin, sulfonamides and tetracycline (ACStSuT), but isolates being resistant to e.g. fluoroquinolones as well have been detected. DT104 is now known as an important and emerging pathogen in many countries (2, 3, 4, 5). DT104 has been reported to spread rapidly between animals within the herd, between herds and to other species (6). The described combination of the ability to spread rapidly and the multi-resistance towards antibiotics used frequently in animals and humans implies that DT104 can be a serious problem for both animals and humans.

By June 1999 DT104 has been detected in 16 swine herds, 12 combined swine and cattle herds and 2 cattle herds in Denmark. Humane DT104 cases have slightly increased in Denmark from 1997 to 1998. DT104 now accounts for 13 pct. of Salmonella Typhimurium phage types compared to 7 pct. in 1997. This increase is explained by the first community outbreak of DT104 in Denmark (7).

In order to protect the consumers, the Danish Bacon and Meat Council decided to depopulate infected herds, when the first herd was detected in 1996 (8).

In Denmark, multi-resistant Salmonella Typhimurium DT104 is officially declared an unwanted bacteria in any food. Any food, Danish as well as imported, containing multi-resistant DT 104 must be heat treated in order to protect the consumers. Consequently, when DT 104 is detected in pork at Danish slaughterhouses, all carcasses from the day of slaughter in question must be heat treated.

At an annually basis approximately 28,000 samples of pork taken at the slaughterhouses are examined for Salmonella by culture complying to the Danish Salmonella Surveillance and Control program (9). In 1998 DT 104 was only detected 3 times at Danish swine slaughterhouses, one time at 3 different slaughterhouses.

In order to find DT 104 infected swine herds, a mandatory tracing back procedure is performed by strategical use of serology and culture. The tracing back procedure is done in co-operation between the slaughterhouse, The Danish Bacon and Meat Council, and The Danish Veterinary and Food Administration.