THE INTENSIFIED CONTROL PROGRAM FOR 
SALMONELLA IN DANISH PORK

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Abstract The intensified control program for Salmonella at Danish slaughterhouses was implemented in May 2002 in order to identify slaughterhouses that have an increased prevalence of Salmonella in pork over a period of time. These slaughterhouses must intensify their efforts to reduce the Salmonella prevalence. The surveillance is based upon carcass swab samples. The results of the samples are evaluated for each slaughterhouse every month, and the evaluation is based upon results from the latest 12 months. Slaughterhouses with a Salmonella prevalence of 2.2% or more on individual carcasses are noted, and if a slaughterhouse is noted 4 times during a 6 months period, it is obliged to start an intensified Salmonella control program. The intensified program has so far lead to a reduction of the Salmonella prevalence in pork from 1.7% to 1.4%.

Introduction In Denmark an ongoing surveillance of Salmonella in pork has been implemented since 1993. The surveillance has been optimised and extended in order to further reduce the Salmonella prevalence in pork. In 2001 the Danish pork industry made an agreement with the Danish authorities, that by the end of 2006 the Salmonella prevalence in pork must be reduced with 27% compared to the prevalence in 2001. By the 1st of May 2002 an intensified control program for Salmonella at the slaughterhouses was introduced. The aim of this program is to identify slaughterhouses that have an increased prevalence of Salmonella over a period of time. The slaughterhouses must identify the cause of the Salmonella contamination, work out an intervention plan and implement the initiatives necessary to reduce the prevalence.

Materials and Methods Since the 1st of January 2001 the surveillance of pork has been based upon carcass swab samples taken after 12 hours of cooling. From each carcass three areas of 100 cm² are sampled, yielding a total of 300 cm². The areas sampled are 100 cm² on the hind leg near the tail, 100 cm² near the sternum and 100 cm² on the jowl. These sampling areas are the same as the ones described by FSIS, USA, for slaughterhouses, who want to export to the USA. From each slaughterhouse, slaughtering more than 200 pigs daily, 5 carcasses are sampled every day, and the 5 swab samples are analysed as 1 pooled sample. The results are evaluated for the latest 11 days of slaughter, and if more than 1 sample is positive actions must be taken (Anon., 2005). This surveillance will reveal acute Salmonella problems.

The intensified control program is based upon the same samples as described above, but here the results for the latest 12 months are evaluated monthly. This period will provide a sufficient number of samples to ensure statistical confidence, when a slaughterhouse is noted. Slaughterhouses with a Salmonella prevalence of 2.2% or more on individual carcasses are noted, and if a slaughterhouse is noted 4 times during a 6 months period it is obliged to start an intensified control program (Anon., 2005).

When an intensified control program is started, the slaughterhouse has 1 month: To take samples to identify the cause for the Salmonella contamination if possible, to work out an intervention plan and to implement the initiatives necessary. Within the following 6 months the slaughterhouse must document a lasting effect of the initiatives taken. This can be done in two ways: Either the Salmonella prevalence is again below 2.2% or the slaughterhouse has none or only 1 positive sample monthly in 4 months out of the 6 months. If the time limit is not kept the authorities can demand further initiatives taken.

Results During the first 3 years after implementation 5 slaughterhouses out of 18 slaughterhouses members of the Danish Bacon and Meat Council have had to start an intensified control program. Two of the 5 slaughterhouses have had to start the intensified program twice, given a total of 7 episodes. All of these slaughterhouses but 1 are out of the intensified program again. Five times the slaughterhouses have been able to reduce their Salmonella prevalence within the time limit while 2 slaughterhouses have exceeded the time limit. The authorities have not demanded further initiatives taken.
The *Salmonella* prevalence in pork from slaughterhouses members of The Danish Bacon and Meat Council was 1.7% by the end of 2001. By the end of 2004 the prevalence was reduced to 1.4%. In 2006 the prevalence must be further reduced to 1.2%.

For the Danish Bacon and Meat Council the first 3 years of experience with the intensified controlled program has shown, that as soon as a slaughterhouse is noted for the first time, a major program is started at the slaughterhouse in order to locate the source of *Salmonella* contamination. With a sporadic prevalence with 2 or 3 positive samples a month, this work can be very difficult and requires many samples taken over a period of time. This sampling often includes samples from both the unclean and the clean part of the slaughter line.

An increased prevalence of *Salmonella* may also be caused by introduction of automatic equipment or by introduction of new staff on the slaughter line, but these circumstances seldom influence the slaughter hygiene for more than 1 or 2 months.

The initiatives taken to reduce the *Salmonella* prevalence are highly individual and vary from slaughterhouse to slaughterhouse. Some are improvements or changes in routines that can be implemented immediately. Other initiatives are long-term investments, which takes time to implement.

**Conclusions** By implementing a surveillance that intensifies the focus on slaughterhouses with the highest prevalence of *Salmonella* in pork, it has been possible to reduce the prevalence from 1.7% to 1.4% over a period of 3 years.

**Reference**