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7. *Salmonella* Typhimurium DT41 in poultry

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Salmonella Typhimurium is one of the serovars most frequently involved in human salmonellosis in Europe [1], including Denmark (Appendix Table A2). Worldwide, poultry and poultry related products have been reported as an important reservoir of *S. Typhimurium*. Due to the successful implementation of an efficient *Salmonella* control program the prevalence of *Salmonella* in poultry in Denmark has been very low for a number of years (Appendix Table A6 and A8).

Despite the low prevalence of *Salmonella* in the Danish poultry production, reoccurring isolations of different *Salmonella* types, particularly *S. Typhimurium* phage type DT41, has been made in broiler breeder flocks over the past decades without identifying a clear source [2]. During the last quarter of 2013 an unusually high number of flocks were found positive for *S. Typhimurium* phage types DT40, DT41 and unspecific phage types (RDNC). Isolates were found in the whole poultry production chain, including hatcheries, breeding flocks for the broiler production line, broiler flocks and at the slaughter house. One DT41 isolate was also found in animal feed, but to our knowledge this feed was not intended for the poultry sector. These DT41 isolates were of particular interest due to the previous history with repeated findings in poultry breeding flocks and the isolates were therefore characterized in more detail using the DNA based typing method, multi locus variable number of tandem repeat analysis (MLVA).

MLVA-results showed that the three isolates, where the phage type could not be determined (RDNC), were related to the DT41 isolates. Based on the MLVA typing the DT41 and the RDNC isolates (41 isolates in total) were split into eight groups. When a maximum divergence at one locus was permitted these could be gathered into four groups. Using this criterion, combined with epidemiological information, a spread of the infection between some of the flocks within a short time could be documented. Furthermore, one subtype of DT41 was found in the whole production pyramid, from broiler breeding flocks to broilers and the poultry slaughter house. The feed isolate was found to be different from the rest of the isolates.

In conclusion, the source of the sudden increase of *S. Typhimurium* DT41 in the poultry production remains

unclear, although it could be concluded that a combination of spread within the production pyramid and new introductions had played a role. However, further studies using more discriminatory typing methods to investigate this in more detail are in progress.

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