



A Preliminary Risk Assessment of Yersinia Enterocolitica in the Food Chain: Some Aspects Related to Human Health in Norway

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Authors' contributions

This work was carried out in collaboration among all authors. The opinion has been assessed and approved by the Panel on Biological Hazards of VKM. All authors read and approved the final manuscript.

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ABSTRACT

This preliminary risk assessment is a result of self-tasking by the Panel on Biological Hazards, Norwegian Scientific Committee for Food Safety. The suggestion was offered to the Norwegian Food Safety Authority (Mattilsynet), which responded and requested a risk profile, or a preliminary risk assessment, to evaluate whether a full risk assessment would be needed at a later date.

Yersinia enterocolitica is one of a few zoonotic bacteria that have a stable reservoir within the domestic animal population in Norway. This bacterial species has been isolated from human patients with acute enteritis, who sometimes exhibit symptoms resembling appendicitis. *Y. enterocolitica* has attracted considerable attention due to its ability to cause serious post-infectious complications. Serious clinical consequences occur relatively often with *Y. enterocolitica* as a relatively high frequency of people in Norway possess the tissue type HLA-B27. A severe sequela linked to this tissue type is reactive arthritis. The cold climate in Norway may enhance growth of *Y. enterocolitica*. Although the predominant cause of yersiniosis in Norway is *Y. enterocolitica* O:3,

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and the pig is considered the main source of infection, the relative contribution of pork consumption compared with other risk factors, for example drinking untreated water, is unknown. In Norway, a decline in human cases of yersiniosis has been recorded since the beginning of the 1990s. This decline has been attributed to implementation of improved slaughtering methods, including enclosure of the anus into a plastic bag after rectum-loosening. In Norway, most fattening pigs are slaughtered at the age of 150 to 180 days. By this age the tonsils may be an even more significant source of human pathogenic *Y. enterocolitica* than intestinal contents, since the occurrence in the intestinal tract and faeces is reduced at the time of slaughter. Accordingly, hygienic handling of the head and the plucks during slaughter and dressing is very important to avoid contamination of the carcass. The most efficient way to limit the spread from tongue and tonsils is probably decapitation early on in the carcass dressing procedure. In such a procedure, the head, including tongue and tonsils, should be removed on a separate line. Also, avoidance of incision of the sub-maxillary lymph nodes might reduce the spread. Epidemiological data suggest that it is possible to reduce the herd prevalence of *Y. enterocolitica* O:3 by minimising contact between infected and noninfected herds. Further, attempts to reduce the prevalence at the top levels of the breeding pyramids may be beneficial for the industry as a whole. The meat industry might be able to categorise herds using serological methods, and use these results in its strategy to reduce the risks for consumers. However, such a strategy has to be evaluated in a cost benefit context. The apparently low prevalence of pathogenic *Y. enterocolitica* in food may be due to lack of suitable selective methods. The culturing methods, which are used routinely in microbiological laboratories, are insufficiently sensitive. There is a need for a standardised DNA-based technique, with improved sensitivity, for the detection of *Y. enterocolitica* in clinical, food and environmental samples.

Keywords: *The Norwegian Scientific Committee for Food Safety; the VKM; Yersinia enterocolitica.*

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NOTE:

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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