

Risks of spreading of pathogens via sewerage overflows to surface water used as drinking water for dairy cattle.

Stefanie J.W.H. Oude Elferink<sup>1</sup>, Henno P. van Dokkum<sup>2</sup>, Jaap A. Wagenaar<sup>3</sup>, and Gerwin A.L. Meijer<sup>1</sup>.

<sup>1</sup>ID TNO Animal Nutrition, Lelystad, The Netherlands

<sup>2</sup>TNO-MEP, Den Helder, The Netherlands

<sup>3</sup>ID Lelystad, Department of Bacteriology, Lelystad, The Netherlands

Sewage that is emitted directly to surface water via overflows due to heavy rainfall or obstruction of the sewerage system has been shown to pose a risk to production and fertility of dairy cattle drinking from this surface water (Meijer et al. 1999). Apart from contamination of the surface water with different chemical and toxic compounds, decreased performance of dairy cattle may be due to increased exposure to pathogens. A literature search indicated that exposure to *Salmonella* and *Mycobacterium paratuberculosis* may be increased due to contamination of surface water via sewerage overflows. This has recently led to the advice to determine these pathogens in sludge that is intended to be applied on pastures. Other pathogens that may be expected to be spread by overflows are for example *Listeria*, *Campylobacter*, *Giardia*, and *Cryptosporidium*. However, these pathogens probably do not increase the risk for animal health because they are ubiquitous in the animal environment. *E. coli* O157:H7 and parasitic worms may also be spread, but will affect product quality rather than animal health. Furthermore, *Neospora caninum*, a protozoa responsible for the largest part of abortions with determined cause in dairy cattle, may possibly be spread by the overflow of sewage.

*E. coli* is used as a marker for faecal contamination of surface water and is comprised in the standard evaluation of drinking water quality for livestock. Recent results show that many of the small surface waters used as drinking water for cattle contain unacceptably high levels of *E. coli*. These high levels seem to be largely independent of the presence of a sewerage overflow and could originate from animal manure. These results emphasise the need for more specific markers to determine the presence of different pathogens in surface water, as well as the need for a study on the origin of high *E. coli* levels in surface water.