

ASSESSING THE POTENTIAL FOR PATHOGEN TRANSFER FROM GRASSLAND SOILS TO SURFACE WATERS

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Contamination of surface waters with pathogenic micro-organisms is an area of growing importance in the context of diffuse agricultural pollution. Hydrological pathways linking farmed land to receiving waters may operate as vectors of disease transmission. Runoff from grassland systems may be particularly important. In this chapter, we synthesize and evaluate recent and contextual studies relating to the issue. The chapter is necessarily wide ranging and interdisciplinary but we have focused largely on the hydrological, soil-based, and microbiological perspectives. The potential for pathogen presence in livestock wastes is demonstrated through prevalence studies, and subsequent loading of grasslands with contaminated wastes generates a potential surface store of pathogens. These microbes may then be transferred to the wider environment when source and transport drivers are combined in, for example, precipitation events. The delivery of contaminated agricultural drainage waters into first order streams may impact the quality and ecological balance of watercourses if the micro-organisms of concern are still viable. This chapter evaluates both die-off and transfer processes operating from source through to the end point receptors in surface waters. Gaps in knowledge are identified and

appear to be due to the contribution of heterogeneity and hydrological complexity of agricultural catchments and the complications of prevalence data derived via a range of methodologies.