

Workshop „Pharmaceuticals in Soil, Sludge and Slurry” of the German Federal Environment Agency (18th June to 19th June 2013)

TITLE: ANTIBIOTIC RESISTANCE IN THE ENVIRONMENT

AUTHORS/INSTITUTION: H. Schmitt
Institute for Risk Assessment Sciences
Utrecht University
PO Box 80175
3508 TD Utrecht
The Netherlands

PRESENTER: h.schmitt@uu.nl

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ABSTRACT BODY:

Aside to direct effects of antibiotics on microbial communities, the possibility of inducing antibiotic resistance represents a potential additional risk. Different pathways might lead to an increase of antibiotic resistance in the environment, and more specifically, in soils: the introduction of resistant bacteria with animal manure or human sewage sludge, the selection of resistant environmental bacteria by the presence of antibiotic residues, and gene transfer between human/animal and environmental bacteria. In a literature study, experimental evidence for these pathways has been gathered and analyzed, and an overview of the experimental approaches taken has been provided. It appears that there is evidence for the possibility of all these pathways. However, it is still difficult to prove whether environmentally realistic concentrations of antibiotic residues are high enough to increase the processes. With respect to a human risk assessment of the presence of antibiotic resistance in the environment, comparisons are made with the risk assessment of resistance in different matrices (e.g. food), and research gaps and possibilities for an inclusion of this endpoint are discussed.