Spreading antibiotics in the soil affects microbial ecosystems

March 30 2009

Antibiotics used extensively in intensive livestock production may be having an adverse effect on agricultural soil ecosystems. In a presentation to the Society for General Microbiology meeting at Harrogate International Centre, today (Monday 30 March), Dr Heike Schmitt from the University of Utrecht, the Netherlands described how antibiotics passed from the animals in manure that was then spread on farmland. Although higher organisms, such as earthworms, would only be affected at unrealistic concentrations of antibiotics, changes in soil bacterial communities have been found repeatedly using molecular microbiological techniques.

Bacteria involved in the nitrogen cycle, which replenishes nutrients in the soil, seem to be particularly affected. The effects persisted over several weeks and were still seen even when the antibiotics had broken down significantly. In addition the microbial population of the soil changed as fungi replaced the bacteria suppressed by the antibiotics.

"The antibiotic concentrations that to date have been found in agricultural soils are smaller than the concentrations at which the adverse effects start occurring", said Dr Schmitt, "However, this might not be the case for 'hot spots", for example, when manure is not mixed thoroughly in the soil."

Source: Society for General Microbiology