



Water saving strategies of industrialized countries as well as environmental changes like water scarcity and population growth demand for new solutions in sanitation. In addition, an extended reuse of wastewater is expected in the future. As wastewater contains many excreted pathogens the reuse can result in health risks for the population. New sanitary concepts step in prior to the production of contaminated wastewater. Faeces, containing most of the pathogens can be separated from the urine and treated separately, for example by using vermiculture

Dealing with compost from human faeces raises health concerns, but poses compost from human faeces really a high risk to public's health than conventional discharged wastewater?

Study sites and analysed parameter

Sewage plant effluent

Three sewage plant types (n = 6)
 Location: Swist, North-Rhine Westphalia, Germany
 Annual discharge (6 mio. m³) equivalent to 1/4 of the yearly water runoff at the catchment outlet (25.9 mio m³).

Compost

Decentralized sanitation system
 Location: Historical watermill, Burscheid, NRW
 Faeces are collected in a rotten-bag and composted

Microbiological parameter

E. coli, coliform bacteria, clostridia spores, Salmonella and heterotrophic plate count

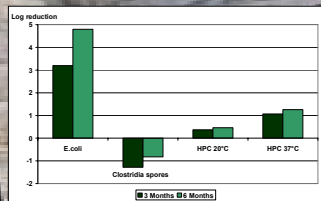
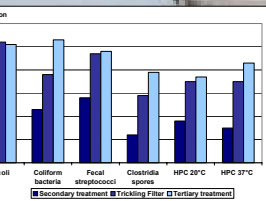
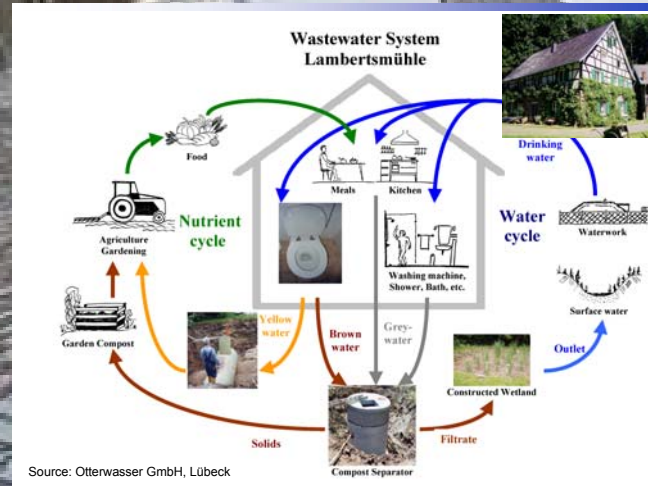


Figure 2: Reduction of microorganism (log₁₀) in vermicompost harvested after three and six months

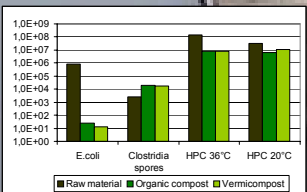


Figure 3: Microorganism concentrations found in uncomposted faeces, organic compost and vermicompost from human faeces

Results

Sewage plant effluent

- 1.8 log₁₀ to 3.0 log₁₀ microbiological reduction
- Reduction efficacy depending on the design of the plant (Figure 1)

Compost

- 3 log₁₀ microbiological reduction after three months
- Results getting even better during the further composting process (Figure 2)
- Microbiologically, human faeces compost does not differ from regular compost (Figure 3)

Conclusions

The level of the microbial contamination in one milliliter of finally treated sewage effluent is equal or lower than the amount in one gram of compost, depending on the type of treatment plant

The awareness for health risks resulting from compost application is much higher than for the usage of sewage effluent receiving water courses

Health risk assessments of sanitary systems will take this into account and put into perspective the actual health risk