Comparing microbial die-off in separately collected faeces with ash and sawdust additives

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Abstract
In a urine diversion dry toilet (UDDT), the urine and faeces are collected separately in order to recycle their nutrient content unmixed. In a UDDT, an additive e.g. lime, wood ash, dry soil or sawdust, depending on which one is easily accessed by the users, is usually sprinkled to the faeces after each defecation. The purpose of the additive is primarily to keep away the flies and odours and to contribute to primary treatment of the faeces. In this paper, ash and sawdust were applied separately to source-separated faeces during the collection phase, and then the die-off of indicators and pathogens in the mixtures was studied. The die-off of E. coli in the faeces/ash mixture was faster initially (first 7 days) compared to that achieved in the faeces/sawdust mixture even though the die-off achieved after 30–50 days was nearly similar for both mixtures. E. coli was not detected in faeces/ash after about 2 months, but was detected after 2 months in the faeces/sawdust mixture. Enterococcus spp. did not decrease below detection in faeces/ ash or faeces/sawdust mixture but higher numbers (difference of about 2 logs) were detected at all times in faeces/sawdust than in faeces/ash mixture. The difference in the die-off in the mixtures of faeces/ ash and faeces/sawdust was attributed to the differences in the characteristics of the additives, namely, high alkaline mineral content (giving high pH) and lower moisture content of ash compared to sawdust. It is recommended to increase use of ash as additive over sawdust in urine diversion dry toilets.

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