Composting Source Separated Human Faeces For Treatment and Sanitation

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Abstract

In urine diverting toilets, urine and faeces are collected separately. The purpose is to collect the fractions in their undiluted and small volume concentrations and to recycle their nutrient content. Faeces should be treated before they are used in agriculture since they may contain enteric microorganisms, some of which may be pathogenic. In this paper, composting of human faeces with food waste was investigated as a method for treatment and sanitation in three successive experiments. The temperature development in three 405x405x475 mm compost boxes fed with faeces-to-food waste (F:FW) in wet weight ratios of 1:0, 3:1 and 1:1 was studied. The moisture levels were controlled to between 40-60% and the pH range was 6.9-9.4. Use of 25 mm thick styrofoam insulation all around the outside of the compost boxes and turning of the compost once in three days enabled sanitising temperatures (≥50°C) to be reached and sustained for over a week in the F:FW = 1:1 compost. The reduction of >3 $\log_{10}$ for *E. coli* and >4 $\log_{10}$ for *Enterococcus* spp. was achieved when co-composting faeces and food waste in a wet weight mix ratio of about 1:1. This, in combination with the long period of temperatures >50°C indicated that the compost was sanitised.

Key words: Composting, faeces, pathogens, sanitation, temperature

Published in: Kraft E., Bidlingmaier W., de Bertoldi M., Diaz F.L. & Barth J. (Eds.), Proceedings of the ORBIT Waste Management Conference, Weimar, Germany, September 2006: Part 2. Composting – Quality, Application and Benefit, Life Cycle Analysis, Sludge and Soil. ISBN 3-935974-09-4.