

Effects of the compositions of bulking agents on the composting of layer excreta ⁽¹⁾

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Received: Sep. 1, 2017; Accepted: Sep. 28, 2017

Abstract

The purpose of this study was to investigate the effects of the carbon source bulking agent as raw materials on the composting process and compost compositions of layer excreta. The fresh layer excreta were assigned to four treatments with different volume ratio of rice hull: rice straw as bulking agents, i.e., 100:0 (group A; control group), 75:25 (group B), 50:50 (group C) and 25:75 (group D) with raw materials of compost. The raw materials of compost was mixed and composting treatment for 40 days. The composition of compost piles were analyzed before composting, 14th day of composting and after composting. The results showed that the fermentation temperature reached 55°C for more than 15 days in each group. At 14th day of composting, the germination rates (RSG) of for group C was 70%, while RSG of alfalfa and rapeseed all reached over 80%. After composting for 40 days, the RSGs of alfalfa and rapeseed all over 90% for all groups. During the composting period, the groups A and B had lower dry matter loss than the groups C and D. After composting, the moisture and organic carbon contents were respectively decrease than those before and at 14th day of composting, and the pH value gradually increased during composting in all groups. The contents of nitrogen, phosphorous, potassium, calcium, sodium, organic carbon and carbon nitrogen ratio after composting were similar than at 14th day of composting in all groups. The copper and zinc concentrations after composting were 1.14 to 1.25 times and 1.14 to 1.53 times of those before composting, respectively. In conclusion, using rice straw to replace rice hull as bulking agents do not affect the composting process.

Key words: layer excreta, bulking agents, composting.

(1) Contribution No. 2578 from Livestock Research Institute, Council of Agriculture, Executive Yuan.

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