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# Evaluation of Quality and Performance of Compost Made by Co-Composting Municipal Solid Waste and Slaughter House Waste

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## Abstract

Municipal solid waste (MSW) has become a severe problem due to the absence of a proper management system and lack of proper waste disposal plans. This problem is accelerated by adding slaughter house waste (SHW) into the MSW. It generally ends up in open dumps and creates various problems. Composting of MSW would decrease the amount of solid waste and act as a waste management technique. This study aims to explore the potential of using slaughter house waste for compost making in combination with MSW and residual waste (RW), and to identify and analyze the best mixing ratio and operational procedures to accomplish a cost-effective composting operation. Open windrow layer method was used. The experimental heaps were 1.37×2.13×1.52 m and nine heaps with different combinations and ratios of RW, MSW and SHW were designed for this study. Heaps were turned once in two weeks. Physical, chemical and biological changes were determined during the composting process to evaluate the effectiveness of the process. Seed germination and seedling growth were assessed in the final compost by introducing radish and green gram seeds. It was found that ratios of 20:80, SHW:MSW and 30:70, SHW:MSW compost mixtures resulted in remarkably high quality compost than 10:90, 20:80, 30:70 and 50:50 SHW:RW and 10:90 SHW:MSW compost mixtures. Turning the windrows for aeration was found to accelerate the rate of composting. Temperature of 65-75$^{o}$ C in thermophilic stage, C/N ratio of 35:1, pH of 7.3-7.7 (neutral), bulk density of 600-700 kg/m$^3$, conductivity in the range of 4-4.4 mS/cm and moisture in the range of 55-60% and waste mixtures in the ratio of 20:80, SHW:MSW and 30:70 SHW:MSW were in suitable range for the production of acceptable organic fertilizers for the crops. Percentage of seed germination and seedling growth were high in compost containing a ratio of 20:80 SHW:MSW and 30:70 SHW:MSW compost mixtures. Results revealed that compost with slaughterhouse waste is an effective organic fertiliser for test crops. The nutrients lacking in compost made of MSW can only be improved as high quality fertilizer by adding SHW. However, compost made of MSW and SHW alone is not suitable for planting crops and need to be made usable by mixing with soil.

***Keywords:*** Compost, Slaughterhouse waste, Organic fertiliser