

Production of *Eisenia foetida* and vermicompost from poultry waste

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It has long been known that earthworms are important in the breakdown of the organic matter and they release nutrients in the form of vermicompost. The use of earthworms as a waste treatment technique for such waste is gaining popularity. This method is commonly known as vermicomposting. Compared to conventional microbiological composting methods. Vermicomposting produce a product that is more or less homogenous, with desirable aesthetics which reduces level of contaminants and tends to hold more nutrient over a large period without impacting the environment.

Poultry waste contains significant amount of organic salts and ammonia that may kill worms. So, it is necessary to neutralize freshly deposited waste by CaCO_3 . In this neutralized poultry waste and cow dung (in a ratio of 1:1. after maintaining the pH) worms can grow well and the produced vermicompost is of high quality. The present trial demonstration is that vermicomposting can play a significant role in the treatment of poultry waste. Earthworms activity can recover a portion of the nutrient and promote a favorable and physiochemical condition of soil environment. Scientific investigations have established the viability of using earthworms as a treatment technique for numerous waste streams. Hand *et al.* (1988); Raymond *et al.* (1988); Edward and Neuhauser (1988).

Earthworms were sensitive to ammonia and did not survive in the poultry waste they also died in waste in which large quantity of inorganic salts was present. Both ammonia and inorganic salts have very sharp cutoff point between being toxic and nontoxic *i.e.* <0.5 mg/g of ammonia and <5 % salts for worms.

Characteristics of Eisenia foetida that process organic waste:

They have a very wide temperature tolerance and can live in a organic waste with large range of moisture

contents. Watanabe and Tsukamata (1976), Hartenstein (1978), Kalpana *et al.* (1980), Edward and Neuhauser *et al.* (1988) all investigated that production growth and population biology of *E. foetida*, when fed on the animal manure, the nutrient content of vermicompost differs greatly depending on the parent material. The important feature of vermicompost is that during the processing of poultry waste by earthworms, many nutrients changed the form that are more readily taken up by plants, such as nitrate or ammonium nitrogen, exchangeable phosphorus and soluble potassium, calcium and magnesium.

Optimal conditions for breeding and vermicomposting of Eisenia foetida:

Condition	Requirement
Temperature	25-35 C
Moisture	80-90 %
pH	>5<9
Ammonia content of poultry waste	Low <0.5mg/g
Salt content of poultry waste	Low<0.5%

1:1 combinations of neutralized poultry waste and cow dung were used in vermibins having a basal layer of broken bricks, coarse sand 6-7 cm and a layer of substrate of 30 cm.. Substrate material was semidecomposed for 45 day.

Before to inoculate 50 gm. earthworms in vermibins (worms should be counted and length were measured in cm.). Then these vermibins were covered with wet gunny bags to maintain the moisture and temperature. It should be protected from ants and other predators. After that regular recording of temperature by Thermometer and moisture by Moisture meter was done and during whole experiment, temperature was maintained at 25-27 c and

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