

The effects of multiple applications of different organic wastes on the growth, fecundity and survival of Eisenia fetida (Savigny) (Lumbricidae)

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Summary

The growth, fecundity, and mortality of the epigeic earthworm *Eisenia fetida*, in a range of *different wastes* were studied for more than one year in the laboratory. Separated, pre-composted, and fresh cattle manure solids, fresh pig manure solids of *different* levels of maturity (nursery young, growing-finish, and sow pigs), and fruit and vegetable *wastes* from a supermarket were offered to the earthworms as substrates. The growth, fecundity and mortality of *E. fetida* were monitored for 23 weeks until the earthworms stopped producing cocoons. The surviving adult earthworms in each substrate were separated into two population groups. The first group was cultured without any further substrate additions (batch cultures), using the earthworm casts as bedding. The second group was cultured in their casts with new substrates added regularly (continuous cultures). The second and third new substrate changes were after intervals of 22 and 15 weeks respectively. *E. fetida* could not survive in fresh cattle solids, fresh young pig solids, fruit *wastes*, and vegetable *wastes*. The growth of *E. fetida* in growing-finish pig solids and sow pig solids was faster than in either separated cattle solids or pre-composted cattle solids. Most earthworms produced cocoons again when the second substrate was added. The rate of growth of *E. fetida* was slower and the cocoon and hatchling production was lower after adding the third substrate. Some *E. fetida* could survive without any new substrate addition up to 60 weeks.

Keywords: *Eisenia fetida*; batch cultures; continuous cultures; cattle solids; pig solids; fruit *wastes*; vegetable *wastes*