Dose-response effects of starch in chicken excreta on *Musca domestica* larval performance and bioconversion efficiency

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Housefly (*Musca domestica* L.) larvae can convert animal manures into valuable protein and fat but little is known about their nutritional requirements. Larval performance and bioconversion might be limited by available energy and competition with microbiota. In this study we assessed the effects of differential starch content in unsterilized (UE) and heat sterilized chicken excreta (SE) on larval performance and bioconversion.

Gelatinized corn starch was added to excreta to construct substrates ranging from 0 to 50% starch based on substrate dry mass. Substrates were inoculated with housefly eggs (8/g wet substrate) and larvae harvested by floatation after 5 days.

Individual larval mass increased from 12±0.2 (UE) and 13±0.4 (SE) mg at 0% starch up to 18±0.4 (UE) and 18±0.5 (SE) mg at 15% starch and decreased to 5±0.4 (UE and SE) mg in 50% starch. Highest total larva wet yield in UE was 39±2.3 g at 10% starch, 43±2.8 g in SE at 15% starch, decreasing to a minimum of 3±1.5 g (UE) and 4±1.3 g (SE) in 50% starch. The decrease in yield after its maximum was faster in UE compared to SE. Larval survival was highest in 0% starch, 80±8% (UE) and 72±13 % (SE), de-creasing to 14±7% (UE) and 18±3% (SE) in 50% starch. Dry matter bioconversion in-creased from 4±0.1% (UE) and 4±0.3% (SE) in 0% starch to 6±0.2 in UE with 10% starch and 7±0.3 in SE with 15% starch, decreasing to 0.2±0.0% (UE) and 0.6±0.2% (SE) in 50% starch. Highest nitrogen bioconversion was 15±0.5% in UE with 10% starch and 15±0.5% in SE with 15% starch, decreasing for higher starch content. These optimal starch inclusions to UE and SE increased nitrogen bioconversion with 40 and 100% respectively, compared to pure excreta. Pronounced effects of starch on pH and ammonia content were also observed. The results indicate that adding easily digestible energy to chicken excreta can substantially increase larval yield and nitrogen bioconversion while reducing ammonia content in the substrate residue.