Loss of animal feed due to infestation by Rhyzopertha dominica

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Abstract

Despite the use of natural food for livestock production, different animal feeds are currently available at the market. Long-term storage of these animal feeds lead to deterioration and contamination by insects. Therefore, it is important that the loss of these animal feeds be determined and methods to control the damage be sought. This study was conducted to determine the loss of eleven types of animal feed commonly used in Sri Lanka due to infestation by *Rhyzopertha dominica*, a major granivorous insect species.

Twenty newly emerged adults of *R. dominica* were introduced separately to each animal feed: fish feed, rabbit feed, dog feed, cat feed, chick mash, grower mash, layer mash, broiler starter, broiler finisher, bird feed (Bajiri), and rice polish. Each animal feed was maintained either aerated or air tight. These parent adults were maintained for 21 days in the media under ambient environmental conditions (30°C, 65% relative humidity), and then removed. The progeny adults emerged in each feed sample were removed and the weight of the samples was determined at monthly intervals. In general, weight loss of animal feed varied with the feed type, duration of exposure, and aeration condition. Attention needs to be paid to protect those animal feeds that recorded higher losses due to *R. dominica* during storage.

Keywords: Animal feed, *Rhyzopertha dominica*, Weight loss, Duration, Aeration

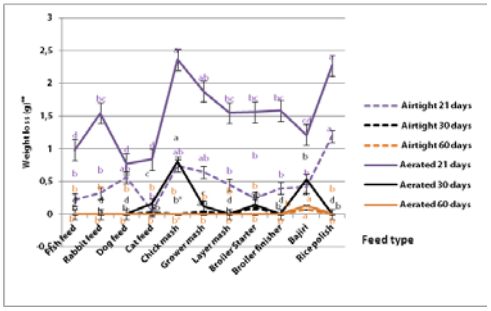
1. Introduction

Traditional practice to feed farm animals is by natural vegetation, but different animal feeds are now available at the market as an alternative. During storage, these animal feeds can be infested by insects. The lesser grain borer, *Rhyzopertha dominica*, is a major pest of stored cereals (Chittenden, 1911), pharmaceuticals, leather stuffing, and packing materials (Riley, 1882; Chittenden, 1911; Winterbottom, 1922; Hoffman, 1933; Potter, 1935). There is a potential that animal feeds can be infested by *R. dominica*. The objective of this research was to examine the potential of *R. dominica* to damage eleven types of animal feed commonly used in Sri Lanka.

2. Materials and methods

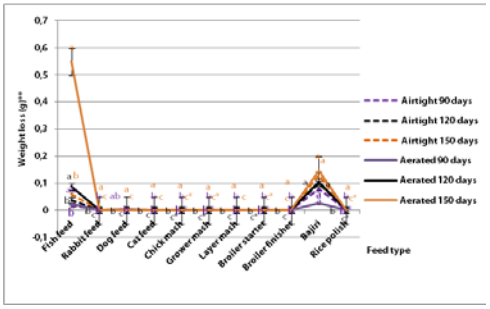
Eleven types of animal feed were used in the study: fish feed, rabbit feed, dog feed, cat feed, chick mash, grower mash, layer mash, broiler starter, broiler finisher, bird feed (Bajiri), and rice polish. Twenty adults of newly emerged *R. dominica* were introduced to 20 g of each animal feed in separate vials and maintained either aerated or air tight under the ambient environmental conditions (30°C, 65% relative humidity). The experiment was conducted using four replicates. After 21 days, the parent adults were removed. The progeny adults were counted and the weight of each animal feed was determined at monthly intervals for five months.

3. Results



*Fungal contamination
**For a combination of a 'given aeration (aerated or air tight) and duration', weight loss followed by the same letter are not significantly different at P=0.05 according to Tukey's test following ANOVA.

Fig. 1. Weight loss in animal feed at 21, 30 and 60 days following infestation under aerated/air tight condition.



* Fungal contamination
**For a combination of a 'given aeration (aerated or air tight) and duration', weight loss followed by the same letter are not significantly different at P=0.05 according to Tukey's test following ANOVA.

Fig. 2. Weight loss of animal feed at 90, 120 and 150 days following infestation under aerated/air tight condition.

4. Discussion

Aerated samples of a given animal feed demonstrated higher weight loss than air-tight samples. The maximum weight loss occurred in chick mass and Bajiri. The minimum weight loss was recorded in dog feed and cat feed. Discard of certain animal feed samples due to fungal contamination seemingly interrupted the smooth increase of weight loss when the duration increased.

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Quality and Safety Conditions of Flocked Oats (*Avena Sativa* L.) Stored in Bags

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Abstract

Oats (*Avena sativa* L.) have reached the healthy food market worldwide due to its special nutrients composition and fiber high quality. Therefore, quality & safety control is a must, both during the storage and commercialization stages. The current study evaluated the physicochemical characteristics (flakes size/variation %, pH, moisture content-mc, water activity-aw), living organisms (insects & mites / mycoflora - fungi load& genera identification), mycotoxins(ochratoxin A – OTA / zearalenone – ZON / aflatoxins – AFLs / esterigmatocistin – EST)andthe storage conditions of flocked oats stored inbags.Regarding the oats physicochemical characteristics, flakes particle size varied, however most of the samples present size uniformityand only one sample had high percentage of residue. That indicates high insects and other living organisms activity (consumption / proliferation) of oats starch and other nutrients. The analysis through