

# An Investigation of the Respirable Dust from Three Forage Types, Alfalfa Cubes, Good Quality Hay and Poor Quality Hay.

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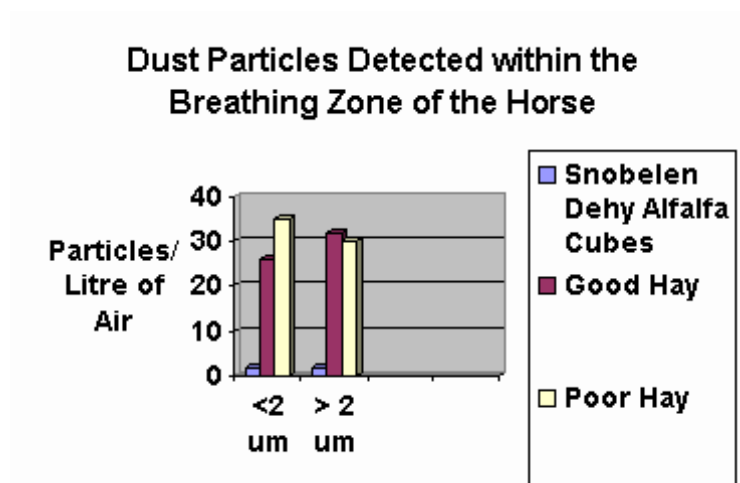
The aim of this study was to compare and contrast the dust levels to which horses are exposed when their forage is provided in a cubed form or with hay. Three diets were examined, good and poor quality hay and Bio-Cube Alfalfa Cubes, using three studies.

## a. A Comparison of respirable dust found within the horse's breathing zone when fed different forage types.

Three horses were housed indoors on dampened shavings. Monitoring occurred for eight hours a day, five days a week for a total of three weeks. Dust was sampled with the BGI-4 respirable dust cyclone which was attached to the animal's halter. Equal volumes of air were sampled in each environment. The amount of dust sampled while the horses were eating alfalfa cubes were significantly lower than the amount measured while feeding on either of the two types of hay (.799, 3.126, and 3.074 mg/m<sup>3</sup> respectively).

## b. A Comparison of the micro-environment of three forage types.

Air samples were taken throughout the trial to identify the number and size of particles which were present in the horse's breathing zone while eating. The instrument used was a Rion particle counter which counts and sizes airborne particles according to different size ranges. Two sizes were analyzed, 1-2 um and 2-5 um. Significant differences were found between alfalfa cubes and dry, new hay for either size range.



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## c. Microscopic assessment of dust from three forage types.

Five samples of dust, from each of the three different types were taken using the Equigene portable airborne particle sampler. The samples were categorized as follows:

**I. Bio-Cube Alfalfa Cubes:** Negligible quantities of mould spores present, the principle dust constituents being plant hairs and other vegetable and miscellaneous fragments. No pollen grains present.

**II. Good Quality Hay:** Mould spores present, primarily the large spored-types. Small numbers of small-spored species may be present. A lot of plant material present.

**III. Poor Quality Hay:** Dust consists primarily of large numbers of respirable spores, mainly fungal spores and some pollen grains. Heavy dust mite infestation and excreta is included in this category.

## Summary

The respirable dust load did not differ between the two types of hay used. Microscopically, it was shown that the good quality hay was not of the quality that one would think when just observing it with the naked eye. In a horse with COPD or a respiratory infection, any level of dust could induce symptoms of COPD or increase duration of an infection. The practise of soaking hay decreases the number of respirable spores, but spores are still ingested and as hay dries the spores will become airborne. This research indicated that feeding Bio-Cube Alfalfa Cubes as forage would lower the respirable challenge to the horse. Alfalfa cubes could be recommended for a horse with COPD or a horse recovering from a respiratory infection or in any situation where the air quality is in question.