Influence of sodium bentonite and activated charcoal on aflatoxin M₁ excretion in milk of goats

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Abstract

An experiment was conducted to find out the carry-over of aflatoxin B₁ (AFB₁) in to milk as AFM₁. Nine crossbred (Alpine×Beetal and Saanen×Beetal) lactating goats in early lactation were randomly divided into three groups of three each in a Latin square layout. Pure AFB₁ was administered to all groups at the rate of 100 ppb in the diet. Group I served as control (T₁). In group II (T₂) sodium bentonite (NaB), and in group III (T₃), activated charcoal (AC), were added at the rate of 1% of DMI. There was no effect (P>0.05) of aflatoxin and/or adsorbent on DMI (kg per day) and daily milk yield (kg per day) during the experimental period of 14 days. The AFM₁ concentration (µg/l), excretion (µg per day) and carry-over (%) of AFB₁ in T₁ continued to increase with the passage of time, whereas, the same was seen to decline in the adsorbent fed groups T₂ and T₃.

The percentage reduction of AFM₁ excretion was higher (P<0.05) in the bentonite (T₂) (66.57±4.85) and AC (T₃) (75.99±7.13) groups in comparison to T₁ on the 14th day of the experiment.

The percentage reduction of carry-over was higher (P<0.01) in the bentonite (T₂) (65.26±3.24) and AC (T₃) (76.09±6.36) groups in comparison to T₁. There was no effect of adsorbents on milk composition except Zn which was greater (P<0.05) in T₃ in comparison to T₁ and T₂.

Thus, it can be concluded that supplementation of NaB or AC at 1% of DMI for early lactating goats resulted in significant reduction in AFM₁ content of milk and carry over of aflatoxin from feed to milk without causing any change in composition of milk. Milk containing AFM₁ may adversely affect the health of humans when consumed. This study suggests approaches to reducing AFM₁ excretion in the milk of goats receiving feeds contaminated with low levels of AFB₁.
This study proves that Sodium Bentonite, a sister clay to Calcium Bentonite, which is the clay type that is ION-MIN® can significantly amend bacterial infection in animals. This study has application to human internal environments as well.

In this study, the Bentonite performed almost as well as the activated charcoal. However, not explained or studied in this experiment is the fact that not only do healing clays have nutrient content, which charcoal does not, but it is far less expensive and performs better than charcoal in adsorbing other contaminants as well.

At CEM we market our products and brands as being capable of antibacterial action. ION-MIN® has strong adsorptive properties and can be used to support detoxification internally when used as directed.