

Measuring cottonseed hull passage by white-tailed deer

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Abstract

Cottonseed hull fragments were identified in feces collected for the first 14 of 17 days after ingestion of 1 g cottonseed hulls by each of 4 adult male white-tailed deer (*Odocoileus virginianus*). Acclimation periods for deer forage evaluation trials should extend at least 14 days prior to food item evaluations to ensure passage of previously consumed fibrous plant materials.

Key Words: digestion, fiber passage, *Odocoileus virginianus*, white-tailed deer

Forage evaluation for wild ruminants has received only limited investigation but will become increasingly important as game ranching and farming accrete and food plantings for big game become more prevalent. A 5- to 7-day collection period is common for forage evaluation studies involving deer (Mautz 1978, Short 1966). However, acclimation periods are ill-defined and have ranged from 7 to 14 days (Nagy and Haufler 1980, Short 1966, Urness et al. 1977). Additionally, fecal analysis is often used to describe temporal dietary composition for wild ruminants. The purpose of this study was to examine the time required for complete digestive passage of a fibrous plant material by white-tailed deer (*Odocoileus virginianus*).

Materials and Methods

On 1 March 1990, 4 captive adult male white-tailed deer were isolated in an empty feed shed (approximately 5.4 × 12.6 m) on Idlewild Research Station, Louisiana Agricultural Experiment Station, East Feliciana Parish, Louisiana. The roofed shed was enclosed on 3 sides by corrugated tin and fenced on the fourth side. Pelleted feed that did not contain cottonseed hulls (CSH) or cottonseed meal was supplied *ad libitum* to deer during the study. On 20 March 1990 (20 days after isolation) all fecal material was removed from the shed and each deer was fed 1 g of ground cottonseed hulls.

All fecal groups were collected daily for the following 21 days, oven-dried at 100° C for at least 24 hours, and individually ground through 0.5-mm screen with a Wiley mill. Except on Day 2 following CSH ingestion when only 18 fecal groups were collected, 20 of the fecal groups collected daily were randomly selected for microscopic analysis and 5 microscope slides prepared from each (Schultz 1990). A 22 × 40 mm area on each slide was examined at 40 power and microhistological techniques (Johnson et al. 1983) applied to identify CSH fragments. The presence or absence of CSH fragments was recorded for each slide, and the proportion of fecal groups containing CSH fragments calculated on a daily basis. All days reported are after cottonseed hull ingestion.

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Results and Discussion

The percentage of fecal groups containing CSH fragments was highest on Day 1, declined irregularly by gradually thereafter, and CSH fragments persisted in fecal groups through day 14 (Fig. 1). No fragments were found in samples collected on days 15-17; therefore, fecal groups collected on days 18-21 were not examined.

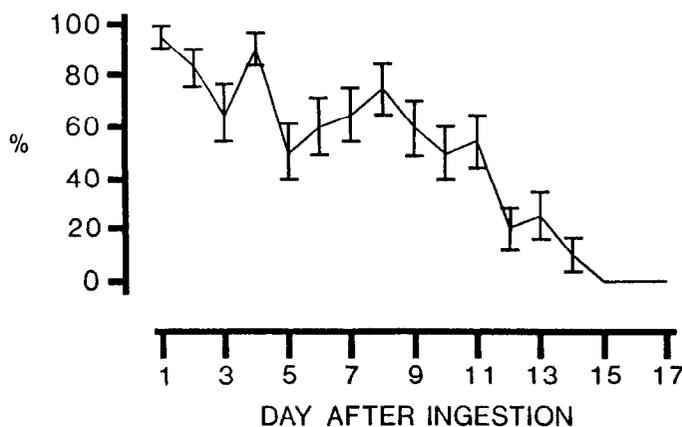


Fig. 1. Average (\pm s.e.) daily percentage of fecal groups containing cottonseed hull fragments after ingestion of 1 g cottonseed hulls by each of 4 adult male white-tailed deer.

Our results indicate that a period longer than previously suspected is needed to ensure passage of fibrous plant material consumed by deer. An acclimation period of at least 14 days should be incorporated into forage evaluation trials for wild ruminants. Researchers utilizing fecal analysis for deer food habit studies should also consider these results when reporting temporal dietary compositions because some food items may have been consumed up to 14 days prior to excretion.

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