

COCOA BEAN MULCH AS A CAUSE OF METHYLXANTHINE TOXICOSIS IN DOGS

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Abstract #190

Background: Cocoa bean shells, a by-product of chocolate production, are sold as mulch for landscaping. Homeowners find cocoa mulch desirable because it degrades into an organic fertilizer and provides an attractive color and odor. Unprocessed beans, derived from the *Theobroma cacao* plant, contain 1-4% theobromine/0.07-0.36% caffeine whereas, cocoa bean mulch contains 0.19%-2.98% theobromine. Some dogs find the mulch attractive and eat small to large quantities.

Case Series: In response to increasing reports of dogs eating cocoa bean mulch used in landscaping, a retrospective case study was conducted to further define this unique phenomena. Sixteen cases of cocoa mulch ingestion by dogs were managed between January 2002 and April 2003. Of these, six cases were selected for analysis because the final outcome was known, there was evidence/observation of ingestion, and the managing veterinarian assessed the causality relationship as medium or higher. In 50% of the cases vomiting was reported, 33% involved tremors, and in 17% tachycardia, hyperactivity or diarrhea was reported. In 33% of cases no clinical signs developed. In the cases in which tremors were observed, the amount ingested was described as large or significant. California accounted for 67% of cases.

Conclusion: Dogs consuming cocoa bean mulch may develop methylxanthine toxicosis. Retrospective case data suggests clinical signs following ingestion include vomiting and muscle tremors. Although oral doses could not be quantitatively determined, clinical severity increased with increasing qualitative dose descriptions. Therefore, treatment should be directed at controlling clinical signs until recovery and preventing further exposure. Pet owners should avoid use of cocoa bean mulch in landscaping around dogs with indiscriminate eating habits.

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Background

- Cocoa bean shell products are increasingly used as mulch
- Natural cacao beans are derived from *Theobroma cacao*
- Unprocessed beans contain 1-4% theobromine and 0.07-0.36% caffeine
- Cocoa bean shell mulch may contain up to 0.19%-2.98% theobromine
- Cocoa bean shells are a by-product of chocolate production
- Cocoa bean shell mulch products have an attractive odor and smell
- Some dogs will eagerly eat large amounts of cocoa bean shell mulch



Case Series

- A retrospective search of ASPCA Animal Poison Control Center data was conducted
- Sixteen cases of cocoa bean shell mulch ingestion by dogs reported 01/02 to 04/03
- Six selected for analysis because outcome was known and ingestion was documented
- Clinical signs reported most to least in dogs were vomiting, tremors, tachycardia, hyperactivity, diarrhea
- In 33% no clinical signs were reported
- In cases involving tremors, ingestion amounts were described as large
- California accounted for 67% of cases

Conclusions

- Low doses of methylxanthines in dogs cause gastrointestinal upset
- High doses cause tachycardia, muscle tremors, seizures and even death
- Drolet documented the death of a dog after eating a large amount of cocoa bean shell mulch containing 0.46% theobromine
- Cases we managed involved dogs which developed vomiting, tremors, tachycardia, hyperactivity, or diarrhea with full recovery
- Clinical severity appears to correlate with increasing qualitative dose descriptions
- Treatment of affected dogs includes multiple dose activated charcoal (2 g/kg PO) and tremor control with cardiac monitoring
- Urinary bladder catheterization may reduce reabsorption of methylxanthines
- Other potential exposures include pesticides and mycotoxin-producing mold
- Dogs may experience clinical effects from large ingestions of cocoa bean shell mulch but life-threatening signs were not reported
- We recommend avoiding use of cocoa bean shell mulch in landscaping around unsupervised dogs

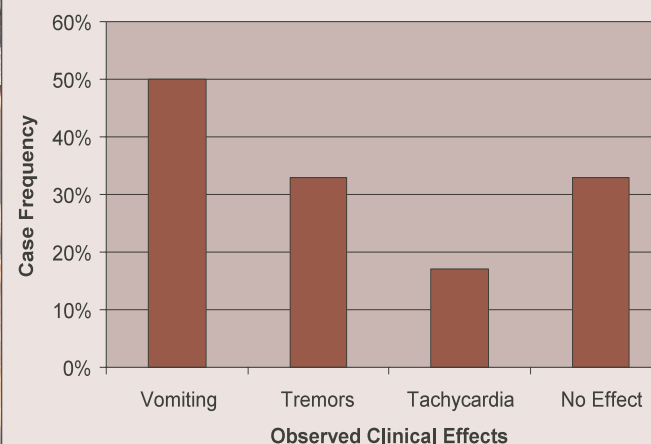
Treatment of Clinical Signs Resulting from Methylxanthine Toxicosis in Dogs

Clinical Sign	Drug	Dose
Seizure	Diazepam	0.5-2 mg/kg IV
	Phenobarbital	2-6 mg/kg IV slowly
Tremor	Diazepam	0.5-2 mg/kg IV
	Methocarbamol	50-220 mg/kg IV slowly
Bradycardia	Atropine	0.01-0.02 mg/kg IV
Tachyarrhythmia	Propranolol	0.02-0.06 mg/kg IV slowly
	Metoprolol	0.04-0.06 mg/kg IV slowly
	Lidocaine	1-2 mg/kg IV slowly, then infuse at 30-50 mcg/kg/min

References

- Drolet R, Arendt TD, Stowe CM. Cacao bean shell poisoning in a dog. JAVMA 1984;185(8):902.
- Blakemore F, Shearer GD. The poisoning of livestock by cacao products. Vet Record 1943;55(15).

Clinical Effects in Dogs Consuming Cocoa Bean Shell Mulch



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