

A Comparison of Common Treatments for Coprophagy in *Canis familiaris*

Broox Boze

Department of Biology
Colorado State University

Bboze@colostate.edu

Boze, B. (2008). A comparison of common treatments for coprophagy in *Canis familiaris*. *Journal of Applied Companion Animal Behavior*, 2(1), 22–28.

Abstract

Coprophagy is a common and undesirable behavior among domestic canines. Data from this study show that 49% of domestic dogs have attempted to eat feces at some point in time and that 28% of dogs are currently coprophagic. Many dog owners are disgusted by this behavior and will go to great lengths to find a treatment for it. Some alter each fecal deposit with hot sauce or other aversive substances, while others try simpler methods such as medication or punishment. Research on coprophagy in canines is sparse, and little is known about treatment efficacy, making coprophagy hard to prevent. In rare cases, medical disorders and intestinal parasites are believed to cause malnourishment, forcing dogs to look for nutrients in abnormal sources. These medical etiologies should be ruled out before owners actively prevent coprophagic behavior.

This study used a survey-based design to compare 11 methods for preventing coprophagy. Data showed that the most effective treatments for coprophagy require an active owner–dog relationship. Preventing access to the feces by keeping the dog on a lead, rewarding positive post-elimination behavior and distracting the dog from the feces were the most effective treatments studied. The medications Deter® and Forbid® were moderately effective, with success rates being much higher in younger dogs. The least effective treatment studied was actively ignoring the behavior in the hope that it would go away. The owner of a coprophagic dog must take an active role in preventing coprophagy and be aware of the dog and its surroundings.

Introduction

The word “coprophagy” comes from the Greek roots *copros* (feces) and *phagein* (eating). While necessary for some species’ survival in the wild, domestic canines exhibit coprophagy primarily in captivity, indicating that something could be internally or externally amiss. Canines known to engage in coprophagy include wolves (*Canis lupis*), coyotes (*C. latrans*) and pet dogs (*C. familiaris*).

Feces eating can be divided into two main categories: caecotrophy, where animals ingest specific feces types (soft or hard pellets from lagomorphs and rodents who possess a separating mechanism in their digestive tract), and coprophagy, a more general consumption of feces from animals with only one type of feces.

Although coprophagy describes consumption of all fecal types, it may be further divided into autocoprophagy, in which the animal eats its own feces, and allocoprophagy, which is consumption of excrement from a conspecific (Galef, 1979). For the purposes of simplicity, this research refers to consumption of all feces types, including those of other species, as coprophagy.

Despite its being an undesirable behavior, there are situations in which coprophagy is natural and even necessary for canines (Beaver, 1994; Wells & Hepper, 2000). Bitches consume pups’ feces to keep the nest clean and undetectable by predators (Haupt, 1982). Coyotes (*C. latrans*) ingest other coyotes’ feces and then replace them with their own to mark

their territory (Livingston, Gipson, Ballard, Sanchez, & Krausman, 2005). Since ungulate digestive systems are only 50–60% efficient, organic matter in their excrement is considered a valuable source of food and nutrition (McDonald, Edwards, & Greenhalgh, 1973), with antioxidant and immunostimulant properties (Haupt, 1982; Negro et al., 2005). Although consumption of ungulate feces is considered natural for canines, the dense matter comprising such feces can trigger medical complications and prevent normal stomach function (Widdowson, 1994).

Coprophagy outside of these conditions, in otherwise normal adult canines, is not instinctive but may be sustained by influences like anxiety, boredom or stress, or nutritional or psychological deficiencies. Animals may seek to balance a nutritional or pancreatic enzyme deficiency (Hart & Hart, 1985). The attention canines receive as punishment for eating feces may inadvertently reinforce the behavior through operant conditioning (Wells, 2003). Minimal research supports these hypotheses, and veterinarians lack the resources to advise concerned clients. Some owners, so disgusted by the behavior that the bond between human and canine is irreversibly damaged, consider euthanasia when conventional treatments are ineffective (McKeown, Luescher, & Machum, 1988).

An animal eating the feces of other species or individuals increases the probability of disease transmission. Parasites transmitted through fecal matter include giardiasis, whipworms, hookworms, roundworms and salmonellosis. Although veterinarians express little concern about coprophagy as a health issue or vector of disease transmission (McKeown et al., 1988), most owners want to stop the behavior.

This study evaluates 11 common treatments for inhibition of coprophagy in domestic dogs. These include three medicines, taste aversion through diet change, addition of meat tenderizer as a dietary supplement, alteration of the feces with unpleasant substances such as hot sauce, prevention of access to the feces, punishment,

distraction, and rewards for appropriate post-elimination behavior. Most case studies on coprophagy treatments do not look at coprophagy as a general disorder but focus on an individual. Comparing treatments in a variety of individuals allows insight into the motivational and causal mechanisms of coprophagy and provides veterinarians and pet owners with better information on the success of numerous treatments.

Materials and Methods

Participants and Distribution

In June and July 2006, 632 dog owners completed a self-administered survey about their dogs' coprophagy and their attempts to stop this behavior. Canines studied were assumed healthy based on vaccination records and assessment of several common disorders (dry heaving, chronic diarrhea or vomiting, pica, and food allergies). Ninety-seven per cent of dogs had current rabies vaccination and 95% were up to date on distemper vaccination. Eighty-five per cent of dogs in this study were spayed or neutered. A variety of full- and mixed-breed canines from 2 weeks to 21 years of age were included in the sample, with slightly more females (56%) than males (44%).

Data were collected from three sources: dog parks, a veterinary hospital and an online survey. Four hundred and sixty-six responses were received online using SurveyMonkey® software, and 166 were collected at Countryside Animal Hospital, and Pine Ridge and Fossil Creek dog parks in Fort Collins, Colorado.

The web-based electronic link to the survey was distributed through online message boards and chat programs devoted to specific breeds and general dog care. Message boards included Yahoo, Google and America Online citations, along with www.dog.com, www.forum.dog.com, and www.ILoveDogs.com.

Physical sites were visited at a variety of times on both weekdays and weekends, during daylight hours. Every individual who entered the park at a given time was asked to complete a survey, and every individual asked to participate

did so to completion. Respondents were asked to complete a survey about animal behavior, with no indication that the study was about coprophagy. Respondents having more than one dog were asked to complete a separate survey for each dog. There was 100% participation, and all respondents participated without compensation. A chi-square test for categorical data showed no difference in presence of coprophagy among data collection locations ($X^2 = 3.270$, $df = 3$, $p = 0.351$), and data were pooled for analysis.

Data on frequency and intensity of coprophagy were collected. Owners also reported the types of feces consumed and demographic information on the canine's age, weight, breed, sex, environment, care and feeding schedule, and medical history. The effectiveness of treatments to stop this behavior was measured on a 5-point semantic differential scale, where applicable treatments were anchored with "very effective" and "ineffective" treatments.

Data Analysis

Since surveys were administered without prior knowledge of the canine's behavior, it was

possible to estimate the frequency of coprophagy in *Canis familiaris*, which has not been done previously. The focal animal of this research is any coprophagic canine, with noncoprophagic canines serving as a control group. Since feces type and environmental stimuli may alter coprophagy, the efficacy of treatments within subgroups is also analyzed. All statistical analysis was done with SPSS for Windows (Version 11.5).

Results

Data indicate that 49.2% (311 of 632) of canines have attempted to eat feces at some point in time and that 28.5% of canines currently engage in this behavior more than once a month.

Because the type of feces consumed may affect the motivation, canines were divided into three groups: those that consume feces regardless of type, those consuming only canine feces, and those eating only herbivorous animal feces. The efficacies of common treatments for canine coprophagy in each category did not vary significantly (Figure 1).

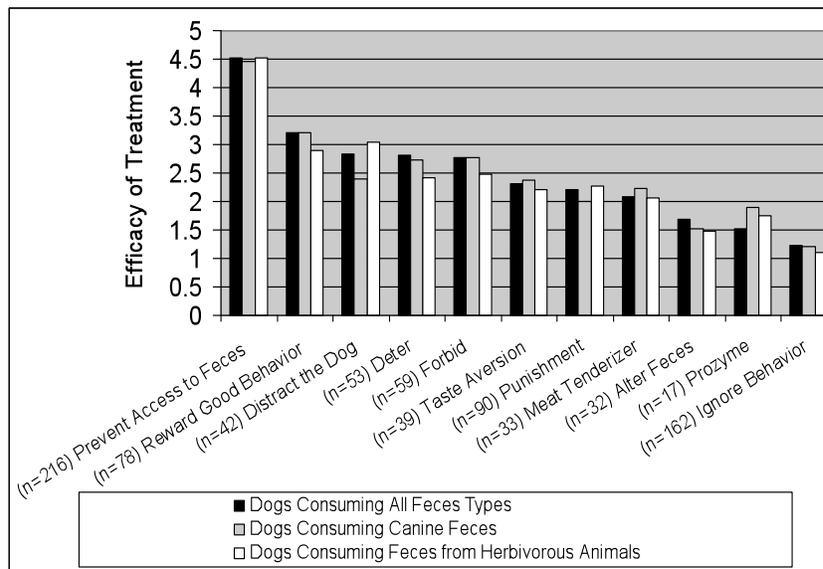


Figure 1: Comparison of treatments for coprophagy in *Canis familiaris* based on the type of feces consumed. Treatments are ranked on a scale where 1 = not effective and 5 = very effective.

Preventing access to feces was the most commonly used and most effective way of stopping the behavior (4.5 on 1–5 scale). Rewarding good behavior (mean 3.1) and distracting the canine from the feces (mean 2.7) were the next best treatments. Because the three most effective treatments involve owner interaction, it suggests that coprophagy is not motivated by a medical disorder but by the environment or situation created by the environment in which the dog lives.

This is supported by the fact that none of the medications tested were reported to be very effective. Prozyme® rated 1.7, suggesting it did not work well in most instances. Deter® and Forbid® received success ratings of 2.61 and 2.67, respectively. Success for these treatments was bimodal, with owners believing them to be

either highly effective or not effective at all. There was no significant difference in weight ($p = 0.733$), exercise ($p = 0.124$), sex ($p = 0.102$), or diet-based type of food ($p = 0.894$) between these two groups of canines.

Younger canines responded better to medication than older animals (Figure 2). There was a significant difference in efficacy of both medication types when dogs were divided into two age groups: dogs 1–4 years old and those older than 4 years. In addition, there was also a difference between the ages of those responding well to Deter® (3.5 years) and those that did not (5.6 years).

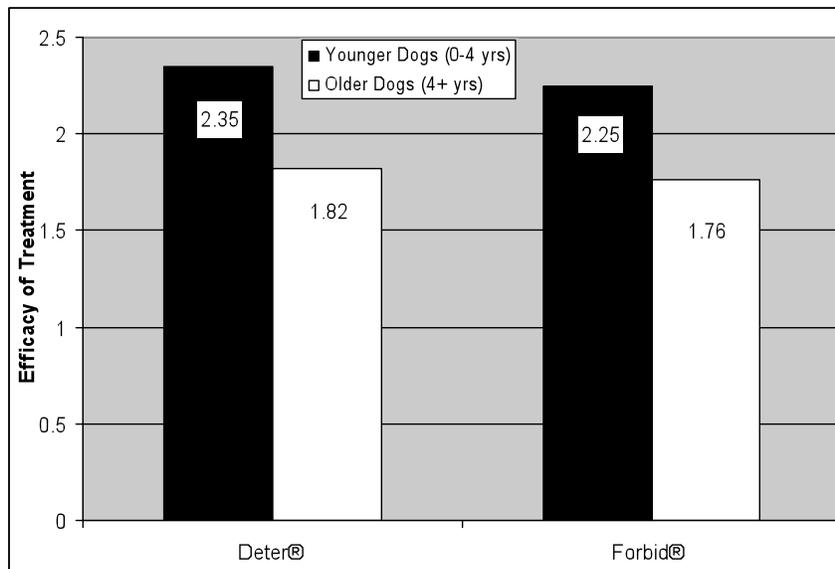


Figure 2: Comparison of age difference in canines' response to medical treatments for coprophagy. A significant difference ($\alpha = 0.10$) was seen between age groups for both Deter® ($p = 0.0381$) and Forbid® ($p = 0.0836$).

Modern dog trainers use positive reinforcement over punishment in most cases (Marschark & Baenniger, 2002). Data show that rewarding good behavior (mean 3.1) is more effective than punishment (mean 2.5). Owners reporting that punishment was effective had dogs that weighed an average of 26 pounds more than those where it was not effective

($p = 0.0167$). It is not clear why weight might affect the efficacy of punishment, and no differences in the efficacy of punishment were apparent in the amount of owner interaction with the pet ($p = 0.8539$) or whether the dog was spayed or neutered ($p = 0.1791$).

While the second most common treatment for coprophagy was actively ignoring the behavior, it was found to be the least effective method (mean = 1.17) for decreasing the frequency of the behavior. Altering the feces, used by less than 5% of dog owners, was slightly less effective (mean = 1.15). Ignoring the behavior did not decrease its frequency, which indicates that coprophagy in domestic canines is not motivated by age and will not likely self extinguish. This also indicates that the behavior is not motivated purely by a canine's need for attention.

Several sources suggest that boredom could be a motivating factor for coprophagy because canines have nothing else to do. This idea is supported because toys such as rawhide and rope, which can be manipulated, entertain and enrich an animal's environment (Houpt, 1985; Loveridge, 1998). Case (2005) relates this to coprophagy and suggests that free feeding may relieve boredom and consequently reduce unwanted coprophagy. Canines were separated into five groups based on frequency of feeding. Binary regression indicates that feeding schedule is not a good predictor ($p = 0.894$) of coprophagic frequency between groups (odds ratio = 0.99; 95% confidence interval, 0.92–10.57). The presence or absence of toys such as rawhide or rope was not found to be a good predictor of coprophagy ($p = 0.35$; odds ratio = 1.17; 95% confidence interval, 0.1–1.34).

Discussion

Attempts to understand motivational factors for coprophagy found that effective treatments for one canine may not work in others and the reasons for this are multidimensional. Because canine consumption of herbivores' feces is normal, it was assumed that motivation and prevention would be different for dogs consuming certain types of feces. However, no differences in efficacy of treatments were found among the types of feces consumed.

Since the three most effective treatments (preventing access to feces, rewarding positive post-elimination behavior, and distraction) for preventing coprophagy involve owner–dog interaction, data indicate the behavior is

controllable. Owners must first consult a veterinarian to determine if coprophagy is motivated by intestinal parasites or a medical disorder in their dog and then take an active role in preventing the dog's access to feces. The owner can be effective in preventing coprophagy in the majority of cases by keeping the dog on a lead when opportunity is high. Some owners opt to muzzle their unaccompanied dog when they cannot be with it.

Animal trainers support positive reinforcement versus punishment (Hiby, Rooney, & Bradshaw, 2004; Marschark & Baenniger, 2002), and our data indicate that coprophagic behavior was more likely to subside when wanted behaviors were rewarded than when unwanted behaviors were punished. Note that the interpretations of both punishment and reward were left up to the subject filling out the survey. This study did not differentiate between positive and negative punishment, so the definition of punishment could include a variety of actions including verbal commands, the removal of treats, or painful stimuli such as kicking, electric shock or even hitting the dog. Rewards could also vary and include things such as verbal praise, play or food treats.

Data indicate that youth could be important in the efficacy of medications for coprophagy. The reasons for this are not well understood. It seems unlikely that a physiological difference would exist between older and younger dogs. From personal observation, it appears that younger dogs are more likely to engage in exploratory behavior and that their behaviors may be more malleable because they have not become habit. From a behavioral perspective, younger dogs are less likely to have multiple associations with coprophagy, and the associations with it could be easier to interrupt. Another potential explanation is that older dogs engage in coprophagy for psychologically compulsive reasons rather than exploratory ones. If this is the case, we would not see the behavior being stopped by the types of medication currently in use for preventing coprophagy and designed to work through a physiological change or taste aversion. Prozyme® is composed of four highly concentrated enzymes

(lipase, amylase, protease and cellulase), which aid in digestion, and help break down food so that nutrients are absorbed more effectively. Deter® and Forbid® are prescription drugs that rely on wheat gluten and monosodium glutamate for taste aversion. On the other hand, if the behavior is compulsive, then medications such as antidepressants or selective serotonin reuptake inhibitors would be more effective.

Logistic regression showed that the time the dog spends alone, interaction time with humans, and exercise were not good predictors of coprophagy in canines when these factors were tested alone. Results also indicate that boredom is not a good predictor of coprophagy. Loveridge (1998) and Houpt (1985) found that rawhide and rope toys enrich an animal's environment; if boredom were a motivating factor, coprophagy should decrease with the presence of toys. In addition, an inverse relationship between coprophagy and frequency of feeding was expected because of the human interaction. However, this was not evident.

Effective treatment may reduce or extinguish coprophagy, but a better

understanding of the motivational factors involved is necessary. Further research on the behavior and environment of canines who engage in feces eating will provide understanding, and eventually prevention, of coprophagy.

Conclusions

1. Efficacy of treatments did not vary by type of feces consumed.
2. The best way to prevent coprophagy in canines is to prevent access to the feces.
3. Medical treatments for coprophagy are more effective in younger dogs.
4. Punishment is not an effective way to prevent coprophagy.
5. Coprophagy does not appear to be motivated by boredom.

Acknowledgements

I would like to thank Janice Moore, Sarah Bevins and Charles Stone for thoughtful discussion on the topic and Stacy Hines-Lambiase for her help with data collection. I couldn't have completed this project without the statistical guidance of Michael Lacy and intellect of Jennie Jamtgaard.

References

- Beaver, B. V. (1994). Owner complaints about canine behavior. *Journal of the American Veterinary Medical Association*, 67, 28–31.
- Case, L. P. (2005). *The dog: Its behavior, nutrition and health*. Ames, Iowa: Blackwell Publishing Company.
- Galef, B. G. (1979). Investigation of the function of coprophagy in juvenile rats. *Journal of Comparative Physiological Psychology*, 93, 295–299.
- Hart, B. L., & Hart, L. A. (1985). *Canine and feline behavioral therapy*. Philadelphia: Lea and Febiger.
- Hiby, E., Rooney, N., & Bradshaw, J. (2004). Dog training methods: Their use, effectiveness and interaction with behavior and welfare. *Animal Welfare*, 13, 63–69.
- Houpt, K. (1982). Ingestive behavior problems of dogs and cats. *Veterinary Clinics of North America: Small Animal Practice*, 12(4), 683–691.
- Houpt, K. (1985). Companion animal behavior: A review of dog and cat behavior in the field, the laboratory and the clinic. *Cornell Veterinarian*, 75, 248–261.

- Livingston, T. R., Gipson, P. S., Ballard, W. B., Sanchez, D. M., & Krausman, P. R. (2005). Scat removal: A source of bias in feces-related studies. *Wildlife Society Bulletin*, 33(1), 172–178.
- Loveridge, G. G. (1998). Environmentally enriched dog housing. *Applied Animal Behavior Science*, 59, 101–113.
- Marschark, E. D., & Baenninger, R. (2002). Modification of instinctive herding dog behavior using reinforcement and punishment. *Anthrozoos*, 15(1), 51–68.
- McDonald, P., Edwards, R. A., & Greenhalgh, J. F. D. (1973). *Animal nutrition*. London: Longman.
- McKeown, D., Luescher, A., & Machum, M. (1988). Coprophagia: Food for thought. *Canadian Veterinary Journal*, 28, 849–850.
- Negro, J. J., Grande, J. M., Tella, J. L., Garrido, J., Hornero, D., Donazar, J. A., Sanchez-Zapata, J. A., Benitez, J. R., & Barcell, M. (2005). An unusual source of essential carotenoids. *Nature*, 416(6883), 807–808.
- Wells, D. L. (2003). Comparison of two treatments for preventing dogs eating their own faeces. *Veterinary Record*, 153, 51–53.
- Wells, D. L., & Hepper, P. G. (2000). Prevalence of behavior problems reported by owners of dogs purchased from an animal rescue shelter. *Applied Animal Behavior Science*, 69, 55–65.
- Widdowson, M. A. (1994). Coprophagic complications. *Veterinary Record*, 134, 396.

© 2008 AABP. This journal may be printed once by the purchaser, for personal use only and may not otherwise be copied or transmitted in any manner in part or in full without permission from the Managing Editor. Quotes of fewer than 200 words are allowed as long as the source is properly cited.