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Diet and dog farts

Expelling gas through the anus (flatus), is normal in dogs. Excessively noisy and/or stinky farts can be a source of humor or annoyance. Twenty nine out of 314 owners of apparently healthy dogs perceived their pets' flatus at least daily (1). In another questionnaire-based study, one third of 47 owners of flatulent dogs found the smell objectionable and would change the dog's diet if it would solve the problem (2).

Flatus largely consists of odorless gases. Malodor is caused by quantitatively minor, volatile sulfur compounds. Above human's odor perception threshold, increasing concentrations of hydrogen sulfide in dog flatus are matched by worsening aroma. The hydrogen sulfide is formed in the large intestine by bacteria that process sulfate, (sulfur-containing) protein fragments and carbohydrates. Formation of hydrogen sulfide is reduced by feeding dogs on a highly digestible, protein-restricted food so that little residue reaches the hindgut, thereby starving and slowing down the stink-producing bacteria.

Compared with soybean meal in the diet, poultry meal may diminish the volume of gas production and make the smell less offensive. The latter was shown in dogs fitted with vests containing a monitoring pump that sampled air near the anus and determined hydrogen sulfide concentrations. Further reduction of hydrogen sulfide in dog flatus may be achieved by fortifying the diet with a preparation of the Yucca schidigera plant.

For an individual gassy dog, a series of dietary tests can be successful in finding a suitable food. Inspecting the ingredient and analysis panels of different foods may lead to identification of potentially beneficial products that are complete, soybean-free, low-protein (less than 20% crude protein in a dry food), low-fiber (less than 2% crude fiber) and, possibly, supplemented with a yucca substance.

Hydrogen sulfide

Part of the gas excreted per rectum is derived from bacterial fermentation in the colon. Hydrogen sulfide (H2S), a very small constituent, appears to cause malodorous flatus. The culprit is formed by sulfate-reducing bacteria (3).

In healthy, instrumented dogs fed a commercial dry food, hydrogen sulfide was measured in air around the anus (4). The dogs moved freely in an enclosed room, together with an odor judge. The odor ratings on a 1-5 scale correlated highly with flatus H2S concentrations. The sensory detection limit was 1 ppm. H2S concentrations varied markedly within dogs over time and between dogs on each day (4). Aging had no effect (5).

Bacterial fermentation

Higher quantities of odorless gases could either dilute or enhance hydrogen sulfide in flatus. Perhaps, extra gas provides a vehicle that diverts the repellant from tissue metabolism. Feeding poorly digestible proteins and carbohydrates, high-fiber ingredients and indigestible, fermentable carbohydrates all promote flatus through increasing substrate availability for bacterial fermentation. Colonic hydrogen sulfide production is further stimulated by supply of sulfate (6) and/or sulfur-containing amino acids.

Clinical signs of digestive impairment may include flatus. Dogs with exocrine pancreatic insufficiency typically present with frequent flatulence, obtaining a severity score of 2 as opposed to 1 (sometimes flatulence) or 0 (no). Dietary digestive enzyme supplementation lowered the rating to 1.2, whereas healthy controls scored 0.5 (7).

Flatus volume

Flatus activity in fecal matter mirrors the state of colonic fermentation. Gas production in feces incubated at 37 oC was much greater when the donor dogs were fed a soy-grit diet rather than an all-meat diet (8). Based on conversion by dog feces (9-11), cellulose is nonflatulant, whereas soy fiber, wheat bran, beet pulp and wheat middlings are flatulent. Cellulose is indigestible in the small intestine; the other substrates are poorly digestible.

Homogenates were inserted into the ligated colon of anesthetized dogs. Inside the gut segment, gas production was negligible after introduction of cellulose, but was powerful for navy beans (12). The intestinal gas area in dogs was quantified noninvasively by radiography. Dietary probiotics had no effect (13), but mixing 30% soybean meal into an extruded corn-poultry diet (14) or replacing 16% corn by soya hulls (15) markedly increased intestinal gas volume.

Malodorous flatus

Soybean versus poultry meal in dry food led to higher, smellable levels of hydrogen sulfide in dogs' rectal gas (16). Dogs (n= 129) were switched from their habitual diet to a high-protein, low-carbohydrate dry food (36% crude protein, 24% nitrogen-free extract) with "poultry and pork dehydrated proteins" as first ingredient (17). After 14 days, the owners classified flatulence as absent in 73% of the dogs, less in 8% and more in 19%.

In a crossover study (18), dogs fed a commercial dry food received placebo and test treats (1 treat/5 kg body weight). Test treats contained three carminatives: activated charcoal (320 mg/treat), Yucca schidigera (2.5 mg) and zinc acetate dihydrate (57 mg). The test treat reduced the number of bad/unbearable farts from two to zero during 3 to 8 hours after feeding. Addition of 0.5% ginger root powder to a canine dry food reduced flatus frequency and H2S content (19).

Fecal odor

Offensiveness of flatus and feces may go hand in hand. Higher protein intake was associated with deteriorated canine fecal aroma (20). In 7 dog studies, yucca ingestion (280 mg preparation/kg diet) lowered overall offensiveness scores for feces by 31% (21, 22). Incubation of dog feces with yucca lowered hydrogen sulfide formation (18), but the mechanism of action remains open.

List of references is available on request from the author (beynen@freeler.nl)

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