

THE ROLE OF NUTRITION IN DIABETES MANAGEMENT

Creating Collaborative Care
Through Nutrition Conversations



A PANEL DISCUSSION

Nutrition is a key component of managing canine and feline diabetes mellitus. In the following discussion,¹ a panel of veterinary experts shares evidence-based approaches to nutritional management, insulin therapy, oral medications, and client engagement.



GOALS OF NUTRITIONAL MANAGEMENT

**Andrew Sparkes, BVetMed, PhD,
Dipl. ECVIM, MANZCVS, MRCVS
(Chair/Moderator)**

Dr. Andrew Sparkes: What is the primary goal of nutritional management for a diabetic dog?

Dr. Angela Rollins: As a nutritionist, my focus is minimizing blood glucose fluctuations. Consistently high glucose may require more insulin, but wide swings between highs and lows may be reduced through nutrition.

Two useful concepts are **glycemic index** and **glycemic load**. Glycemic index describes how quickly a food's carbohydrate raises blood glucose, whereas glycemic load also considers the amount consumed. Watermelon, for example, has a high glycemic index, but a low glycemic load because a typical serving contains relatively little carbohydrate.

Both measures matter: Meal size and composition together determine the overall glycemic response.

For a diabetic dog with immune-mediated disease and no history of pancreatitis, I would generally reduce dietary carbohydrate to lower glycemic load. Pairing remaining carbohydrate with soluble fibers, e.g., psyllium, and some insoluble fiber can slow absorption and reduce glycemic response.

I also prefer higher-protein diets to help offset muscle loss from increased gluconeogenesis and support lean body mass.

Because diabetic dogs use nutrients less efficiently, they may need more energy, particularly before regulation. Even when generally well regulated, I may provide ~20% more energy than for a comparable healthy dog.

Dr. Sparkes: How common is pancreatitis in diabetic dogs?

Dr. Rollins: The literature suggests that pancreatitis affects roughly 20% of dogs with diabetes.²

Dr. Andrew Bugbee: We see it fairly often, but many diabetic

animals have elevated pancreatic lipase without clinical pancreatitis, so results must be interpreted cautiously, particularly in cats. Pancreatic lipase may be elevated without clinical signs in ~60% of newly diagnosed cats and 70% of cats with chronic diabetes.³ These results should inform—not determine—the management plan.

Dr. Rollins: I would not rely on a single laboratory result because diabetes can affect the findings. Clinical history is more informative. Recurrent pancreatitis preceding diabetes suggests chronic pancreatitis. However, elevated canine pancreatic lipase concentration without a history of pancreatitis suggests classic immune-mediated diabetes. This distinction guides degree of dietary fat restriction.

Dr. Sparkes: What is the top dietary priority for a diabetic dog with chronic pancreatitis?

Dr. Rollins: I start with controlling dietary fat to reduce recurrence. The degree of restriction depends on dietary history. A moderate-fat diet may be sufficient if the current diet is very high fat, whereas a dog already eating a lower-fat diet may need a therapeutic low-fat formula.

I assess fat on an energy basis—grams per 1,000 kcal. Less than ~30 g/1,000 kcal is moderate, while therapeutic low-fat diets often provide ~20 g/1,000 kcal. If pancreatitis recurs despite this restriction, referral for a carefully formulated homemade ultra-low-fat diet may be appropriate.

Preventing pancreatitis takes precedence because another episode can require hospitalization and disrupt diabetes regulation. Within that constraint, I still manage carbohydrate intake and glycemic load as effectively as possible. Reducing fat usually requires some increase in carbohydrate, so the goal is to find the best balance for the individual dog.

Dr. Sparkes: Would nutritional management differ for an overweight or obese diabetic dog?

Dr. Rollins: It would depend on the degree of excess weight. If the dog were only slightly overweight, e.g., a body condition score of 6/9, I might not initiate a formal weight-loss plan immediately because the dog may lose some weight as the diabetes is brought under control.

However, obesity can contribute to insulin resistance in dogs, as in cats. For an obese dog, I would use a controlled weight-loss program because improving body condition may reduce insulin requirements and ease diabetes regulation.

Dr. Sparkes: Many diabetic cats are overweight or obese. What are your nutritional priorities for these patients?

Dr. Rollins: Although low-carbohydrate/high-protein diets have traditionally been emphasized for remission, emerging evidence suggests that energy restriction should be a focus for overweight or obese cats. In one study, overweight diabetic cats receiving greater calorie restriction were four times more likely to achieve remission despite eating the same diet, suggesting that energy restriction may improve insulin sensitivity independently of weight loss.⁴

I would therefore prioritize safe energy restriction while continuing to limit carbohydrate intake. Food preference affects what is practical. Dry low-carbohydrate diets may be energy dense, requiring very small portions, whereas canned food can often provide lower carbohydrate intake and more satisfying portions.

I would delay further calorie restriction if a newly diagnosed cat is already losing 2–4% of body weight per week because rapid loss increases risk of muscle loss. Once treatment stabilizes the cat's weight, I would begin a closely monitored weight-loss plan based on estimated ideal body weight. My preferred target is ~0.5–1% body weight loss per week.



“Although low-carbohydrate/high-protein diets have traditionally been emphasized for remission, emerging evidence suggests that energy restriction should be a focus for overweight or obese cats.”
Angela Rollins, DVM, DACVIM (Nutrition)

Dr. Sparkes: Beyond calorie restriction, what other dietary considerations are important for diabetic cats?

Dr. Rollins: Evidence in diabetic cats is limited, but cats generally appear adapted to small, frequent meals. When practical—or supported by continuous glucose-monitoring data—spreading food intake across the day may help.

Lowering dietary carbohydrate can improve glycemic control, but I consider both glycemic index and glycemic load.

For obese cats, lower energy density can support weight loss, appetite control, and practical portions. This usually requires more fiber or less fat, which may increase the proportion of carbohydrate, so the diet must be balanced carefully.

Carbohydrate quality also matters. When two diets have similar carbohydrate content, I generally favor the higher-fiber option because it may slow absorption and moderate the glycemic response.

Total dietary fiber is more informative than crude fiber, which is imprecise. Subtracting total dietary fiber from total carbohydrate provides a rough estimate of available carbohydrate for comparing diets.

Individual responses vary, so clinical response and glucose-monitoring data remain essential. Carbohydrate content should be interpreted alongside fiber, energy density, and the individual cat's response.

INSULIN THERAPY

Dr. Sparkes: Which insulins do you usually consider for diabetic dogs?

Dr. Bugbee: Common starting options are porcine zinc insulin suspension, an FDA-approved veterinary U-40 insulin, and NPH, a human U-100 recombinant insulin. I typically start at ~0.5 unit/kg twice daily, rounded down to the nearest whole unit for easier initial dosing. For underweight dogs, dosing is based on current body weight. For overweight or obese dogs, estimated ideal or lean body weight is preferred to reduce the risk of overdosing.

PZI (protamine zinc insulin), another FDA-approved (dogs and cats) U-40 insulin, is labeled at ~0.5 to 1 unit/kg once daily, which is effective in ~40–45% of dogs. PZI is often started at 0.5 unit/kg twice daily. Its longer duration may benefit some patients.

Degludec is a newer, increasingly affordable basal insulin available in U-100 and U-200 formulations. Unlike intermediate-acting insulins, typically given with food twice daily, degludec does not need to be timed with meals and can be administered even if the dog skips a meal, offering clients greater scheduling flexibility. Its basal action also makes clinically concerning hypoglycemia less likely.

Glargine is another option, particularly when response to other insulins is inadequate or cost is a concern.

Ultimately, insulin selection depends on the individual dog's response, clinical needs, and practical considerations for the client. Remember that diet is as much a part of management as insulin. If a dog responds differently to morning and evening insulin doses, e.g., the response is stronger after the morning dose, we might feed 60% of the daily food in the morning and 40% in the evening. Feeding adjustments should be considered alongside changes in insulin dose because diet can substantially influence the glucose response.

Dr. Rollins: Continuous glucose-monitoring data allow us to personalize management much more effectively.

Dr. Sparkes: When using a basal insulin, would you change the dog's feeding schedule—offering smaller, more frequent meals versus one or two larger meals?

Dr. Rollins: There are not yet strong studies evaluating meal timing with long-acting insulin, but I generally favor smaller, more frequent meals. Even with conventional insulin, this approach can lower each meal's glycemic load and may help reduce large fluctuations in blood glucose.

Dr. Bugbee: With basal insulin, smaller, more frequent meals often provide better control. Some dogs have a pronounced postprandial glucose response that can overwhelm the basal insulin's action. If a dog receiving basal insulin is fed once or twice daily and glucose control is problematic, we often first recommend dividing daily food into smaller, more frequent portions.



“Ultimately, insulin selection depends on the individual dog’s response, clinical needs, and practical considerations for the client. Just remember that diet is as much a part of the management plan as insulin.”
Andrew Bugbee, DVM, DACVIM (SAIM)

Dr. Sparkes: What insulin options do you primarily consider for diabetic cats?

Dr. Bugbee: Before starting insulin, confirm the diagnosis. Stress hyperglycemia in cats can exceed 500 mg/dL and cause glucosuria. Serum fructosamine can help distinguish diabetes from a transient stress response.

My first choices in cats are glargine U-100 and PZI. I generally start these insulins at 1 unit per cat twice daily rather than dosing by body weight, because obesity could lead to overdosing. Newly diagnosed cats rarely need more than 2 units initially.

Degludec can be used in cats, but it usually requires twice-daily administration and offers little advantage over alternatives. NPH is generally avoided. Cats metabolize it quickly, resulting in inadequate duration of action.

Glargine U-300 is a distinct basal insulin with different pharmacologic behavior from glargine U-100, so the concentration must be specified and dosing adjusted accordingly. I typically start at ~0.5 unit/kg based on ideal body weight versus current body weight in overweight or obese cats and use continuous glucose monitoring.

Its basal action allows dose adjustments every few days and may support once-daily administration in some cats. Clinically, I generally consider degludec primarily for dogs and glargine U-300 for cats.

ORAL MEDICATIONS

Dr. Sparkes: What oral medications are available for cats with diabetes?

Dr. Bugbee: Two SGLT2 inhibitors are approved for cats: velagliflozin, an oral solution given at ~1 mg/kg once daily, and bexagliflozin, a once-daily tablet. Either can be given directly or mixed into a little food, followed by the remainder of the meal, to ensure the full dose is consumed. These drugs avoid injections and special insulin handling and offer scheduling flexibility. We usually recommend morning administration. If the client forgets a dose, we typically have clients resume the next day at their usual administration time.

Careful patient selection is essential. The cat should be systemically well, eating consistently, and free of conditions that complicate treatment, e.g., chronic diarrhea. Because the drugs act at the kidney and are metabolized by the liver, evidence is strongest in cats with IRIS stage 1 or 2 CKD; liver enzymes should generally be no more than three times the upper reference limit and total bilirubin < 0.5 mg/dL.

Ketone monitoring is critical. Before treatment, I look for a blood beta-hydroxybutyrate concentration < 3.7 mmol/L. At 2–3 days and at 7, 14, and 30 days, I assess clinical status, body weight, blood glucose, and ketones. Rising ketones generally prompt discontinuation and transition to insulin.

With appropriate selection and monitoring, SGLT2 inhibitors can be effective and may be more manageable for clients concerned about injections. For eligible newly diagnosed cats, I present the options of an SGLT2 inhibitor or insulin, explain benefits and limitations, and involve the owner in choosing the most practical option.

Dr. Sparkes: Why are SGLT2 inhibitors not used in dogs?

Dr. Bugbee: SGLT2 inhibitors lower blood glucose by increasing urinary glucose excretion rather than promoting cellular glucose uptake, so patients must still produce some endogenous insulin. Without it, progressive ketosis can develop, making ketone monitoring essential.

Diabetic dogs are generally insulin deficient and are therefore unlikely to have enough endogenous insulin for SGLT2 inhibitor therapy to be used safely without concurrent insulin.

Newly diagnosed cats, however, are often still producing substantial amounts of insulin, which is why SGLT2 inhibitors are labeled for this population. Obesity is a major risk factor for feline diabetes, and early in the disease these cats may be hyperinsulinemic—producing considerable insulin, but not enough to overcome peripheral insulin resistance.

Some cats with longer-standing diabetes may also respond. However, the longer a cat has required insulin, the greater the concern that endogenous insulin production has declined and the higher the risk of diabetic ketoacidosis with an SGLT2 inhibitor. Monitoring, particularly of ketones, must be more intensive as treatment moves beyond the labeled population.

COMMUNICATION WITH CLIENTS

Dr. Sparkes: Much of the day-to-day treatment of diabetes is carried out by the client. How do you discuss management with owners and build their confidence?

Dr. Bugbee: Most clients already know something about diabetes, so I build on that knowledge while explaining how the disease differs in animals. I emphasize that it is manageable and that treated pets can have a good quality and quantity of life.

For cat owners, the possibility of remission can be motivating. Peer support may also reassure clients anxious about injections by showing that treatment can fit into daily life.

I present SGLT2 inhibitors versus insulin, explaining that oral therapy may be easier initially but is not suitable for every cat and may eventually need to be replaced by insulin. Setting expectations early helps clients remain confident and engaged.

At the first visit, I focus on essentials—medication administration and the dietary plan—rather than overwhelming clients with information. Early rechecks allow us to add information gradually, reinforce key

points, and answer questions. Selected handouts and videos provide additional support. Since oral medications became available, most clients are willing to at least try treating a newly diagnosed diabetic cat.

Dr. Sparkes: How do you discuss importance of a consistent dietary plan with clients?

Dr. Rollins: I often see poorly regulated referral cases. I emphasize a practical, consistent dietary plan. For cats, weight management is essential for achieving and maintaining remission because persistent obesity increases risk of relapse. For dogs, dietary consistency helps control blood glucose.

Treats are acceptable in moderation, but I recommend lower-glycemic options.

Dr. Bugbee: I help owners identify safe, lower-carbohydrate foods their dog enjoys for treats.

For cats, cost may influence dietary choices. When feasible, start by switching from the current dry diet to its canned counterpart and adjusting the plan based on response.

FINAL TAKE-HOME MESSAGES

Dr. Sparkes: What are one or two take-home messages from this discussion?

Dr. Rollins: Diet matters, especially in diabetic dogs. Thoughtful dietary management can help optimize glycemic control and improve overall response to treatment.

I would also emphasize the importance of an individualized approach. Whether we are considering meal timing, food type, nutrient composition, or weight management, every patient is different and the plan should reflect that animal's specific needs.

Dr. Bugbee: We often learn broad dietary rules—for example, high-protein, low-carbohydrate diets for cats or lower-carbohydrate, higher-fiber diets for dogs—but those general recommendations are not always the best choice for every patient. Treat each patient as an individual and

avoid applying the same management plan automatically to every dog or cat with diabetes. Talk with clients about their lifestyle, resources, and the impact of caring for a diabetic pet, then tailor management to what they can realistically maintain. When clients are engaged as partners, adherence is more likely to improve—and so are clinical outcomes.

CHAIR/MODERATOR

Andrew Sparkes, BVetMed, PhD, Dipl. ECVIM, MANZCVS, MRCVS, is a leading feline medicine expert. After completing a residency and PhD, he lectured at the University of Bristol. Dr. Sparkes headed the Division of Small Animal Studies at the Animal Health Trust and later served as Veterinary Director of International Cat Care (iCatCare) and International Society of Feline Medicine (ISFM; now the iCatCare Veterinary Society). Founder and co-editor of the *Journal of Feline Medicine and Surgery*, he works as an independent consultant.

PANELISTS

Andrew Bugbee, DVM, DACVIM (SAIM), is Chief Medical Officer, Clinical Professor and Chief of Internal Medicine, and Director of the Texas A&M Veterinary Endocrinology Clinic and Research program at TAMU College of Veterinary Medicine and Biomedical Sciences. He completed an internship and internal medicine residency at the University of Georgia, then was on faculty at Purdue University and UGA, and then joined TAMU in July 2023.

Angela Rollins, DVM, DACVIM (Nutrition), is a Board-Certified Veterinary Nutritionist® and Clinical Professor at the University of Tennessee College of Veterinary Medicine. She is a lifelong Volunteer, having completed all her education and training (DVM, PhD, and nutrition residency) at the University of Tennessee. Dr. Rollins has served as president of the American Academy of Veterinary Nutrition and the American College of Veterinary Nutrition. Her primary research focus is on companion animal obesity physiology, treatment, and prevention.

¹ Adapted from the live broadcast of The Role of Nutrition in Diabetes Management, a Purina Institute Creating Collaborative Care Through Nutrition Conversations webinar, available on demand at [Purina Institute Webinar Series 2026](#).

² Hess, R. S., Saunders, H. M., Van Winkle, T. J., & Ward, C. R. (2000). Concurrent disorders in dogs with diabetes mellitus: 221 cases (1993–1998). *Journal of the American Veterinary Medical Association*, 217, 1166–1173.

Shields, E. J., Lam, C. J., Cox, A. R., et al. (2015). Extreme beta-cell deficiency in pancreata of dogs with canine diabetes. *PLoS ONE*, 10(6), e0129809. doi: 10.1371/journal.pone.0129809

Tardo, A. M., Del Baldo, F., Dondi, F., et al. (2019). Survival estimates and outcome predictors in dogs with newly diagnosed diabetes mellitus treated in a veterinary teaching hospital. *Veterinary Record*, 185(22), 692. doi: 10.1136/vr.105227

³ Secrest, S., Sharma, A., & Bugbee, A. (2018). Computed tomographic angiography of the pancreas in cats with chronic diabetes mellitus compared to normal cats. *Journal of Veterinary Internal Medicine*, 32(3), 962–966. doi: 10.1111/jvim.14899

Zini, E., Hafner, M., Kook, P., et al. (2015). Longitudinal evaluation of serum pancreatic enzymes and ultrasonographic findings in diabetic cats without clinically relevant pancreatitis at diagnosis. *Journal of Veterinary Internal Medicine*, 29(2), 589–596. doi: 10.1111/jvim.12565

⁴ Jørgensen, F. K., Mohanty, A., Kieler, I. N., et al. (2026). A two-center, randomized controlled trial to determine the effect of 12 weeks of caloric restriction with a novel diet in overweight cats with diabetes mellitus. *Journal of Veterinary Internal Medicine*, 40(2), aalago40. doi: 10.1093/jvimsj/aalago40

For more information and a wealth of pet nutrition resources, visit [PurinaInstitute.com](#) and sign up for scientific communications. By signing up, you'll receive updates on discoveries in nutritional science, free resources to support you in your nutrition conversations with clients, invitations to events, newsletters, and much more from the Purina Institute. [PurinaInstitute.com/Sign-Up](#)

