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Therapeutic Diet is the Constant in Feline Diabetes Management

Q We know that diabetes mellitus occurs in overweight cats, but not all overweight cats develop diabetes. Why not?

A We often hear that diabetes in cats is similar to Type-2 diabetes in people. It's caused by many factors that can interact and lead to the development of diabetes over time. These factors include genetic predisposition, body weight and body condition, diet, activity level, and the presence of comorbid conditions. Just one of those factors is obesity. The more risk factors a cat has and/or the longer insulin resistance persists in any given cat, the higher the likelihood diabetes could develop. In short, some fat cats get lucky and some thin cats still develop diabetes.

Q How does insulin resistance develop in overweight cats?

A Fat is a metabolically active tissue that can cause several undesirable outcomes. Excess body fat can lead to increased production of inflammatory mediators, which perpetuate insulin resistance. Fat also produces adipokines that contribute to insulin resistance and have been shown to influence insulin sensitivity. Excess fat can lead to more leptin production and less adiponectin production, which overall favors an insulin-resistant state.

All of these issues are compounded when cats are fed high-carbohydrate diets, which are known to exacerbate glucose intolerance. Hyperglycemia alone has been shown to be directly toxic to feline beta cells.¹ The longer the insulin resistance and hyperglycemia persist, the more demand there is on beta cells to produce insulin. This contributes to cell exhaustion, dysfunction and eventual cell loss.

Q Once diabetes mellitus has been confirmed in a cat, what chance is there of achieving remission—and what does it take to achieve it?

A According to a survey of approximately 300 ABVP-boarded feline practitioners in the U.S., the average self-reported remission rates for natural disease were around 26%.² Standard therapies include the use of insulin glargine or ProZinc® in combination with a high-protein, low-carbohydrate prescription diet indicated for the nutritional management of feline diabetes. Achieving and maintaining an ideal body weight through dietary therapy and increasing activity

are also important if remission is a goal.

Use of a FreeStyle Libre glucose monitor facilitates more rapid titration of the insulin dose, generally contributing to more rapid initial glycemic control following diagnosis.

Quickly gaining and maintaining control of hyperglycemia are key to achieving remission. In my experience, most cats that will enter remission do so in the first month of management, although it can occur after several months of treatment (or management). Cats that are insulin-treated for more than six to 10 months without achieving remission are unlikely to do so.



A glucose monitor enables cat owners to spot check glucose levels in the comfort of home.

Remission is not always a permanent state, and up to 30% of cats relapse with overt diabetes and need to return to insulin therapy.^{3,4} While it is possible to achieve a second remission, the chances wane significantly after the initial relapse. Meanwhile, cats in remission must remain on a diet used to manage cats with diabetes and be intermittently monitored to ensure glucose levels are within an acceptable range.

“ The more risk factors a cat has and/or the longer insulin resistance persists in any given cat, the higher the likelihood diabetes could develop. ”

¹ Zini E, Osto M, Franchini M, et al. Hyperglycemia but not hyperlipidaemia causes beta cell dysfunction and beta cell loss in the domestic cat. *Diabetologia*. 2009;52:336-346.

² Norsworthy GD, Wexler-Mitchell E. Management of diabetic cats in primary care practices: ABVP roundtable report. *J Feline Med Surg*. 2015;17:967-969.

³ Roomp K, Rand J. Intensive blood glucose control is safe and effective in diabetic cats using home monitoring and treatment with glargine. *J Feline Med Surg*. 2009;11:668-82.

⁴ Gottlieb S, Rand JS, Marshall R, et al. Glycemic status and predictors of relapse for diabetic cats in remission. *J Vet Intern Med*. 2015;29:184-92.

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The “How-Tos” of Selecting a Diet for the Diabetic Cat



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There is no one-size-fits-all formula for feeding a diabetic cat. What is the cat's body condition score (BCS)? Does the cat prefer dry or wet food? Does the cat have a comorbid condition? The answers to these questions—and others—should be weighed when making a feeding recommendation.

Here is a step-by-step guide to formulating a nutrition plan.



Facilitate weight loss.

Most—though not all—cats diagnosed with

diabetes mellitus are overweight, if not obese. The closer we can get a cat to a lean body condition (reducing fat while maintaining lean body mass), the greater the likelihood we have of reducing their exogenous insulin needs and getting them into remission.

Calculating the appropriate number of calories to achieve healthy weight loss starts with **taking a diet history**. This step is essential for any pet being transitioned from one diet to another and is especially important when the goal is healthy weight loss. Taking the time to have the owner fill out a detailed diet history form over the course of a week or two will yield a good estimate of the number of calories the cat currently consumes. The veterinarian can input this information into a calculator¹ that factors in current weight, percentage overweight and BCS, as well as their ideal weight and ideal BCS—and from there calculate an appropriate starting calorie amount.



Adjust the rate of weight loss.

The ideal rate of weight loss varies from 0.5% to 2% of

body weight per week. If the cat loses at a faster rate, he or she may start pulling from lean body mass and lose the wrong kind of weight. If the cat is not losing, calories should be



further decreased by a 10% increment; conversely, if the cat is losing too quickly, a 10% increase in calories is advised. I recommend that owners purchase a small pet or baby scale so they can precisely track their cat's progress at home. Being able to track the cat's weight at home vs. having the owner bring the cat to the clinic for a weigh-in every two weeks can save both time and stress.



Select the most appropriate therapeutic diet.

The most appropriate therapeutic diet for the

diabetic cat depends on several factors.

• If the cat will eat canned food,

I recommend Purina® Pro Plan® Veterinary Diets DM Dietetic Management® Canned Feline Formula. Studies have shown that feeding this diet, along with appropriate insulin administration, may help promote insulin sensitivity and reduce external insulin requirements in cats with diabetes.² Because DM Canned is high in protein and very low in carbohydrate, feeding it can slow the rate of glucose coming into the body and facilitate gluconeogenesis, where the body breaks down protein to make glucose. Canned DM is also highly palatable and is formulated in several different flavors and textures.

• If the cat will eat canned food but is not feeling satiated, I recommend Purina® Pro Plan® Veterinary Diets OM Overweight Management® Canned Feline Formula. This diet is high in

protein and low in starch, but also high in insoluble fiber, which allows the cat to feel satiated.

• If the cat is overweight (above a BCS of 6) and won't eat canned food, I recommend OM Dry Formula to help facilitate weight loss. It is important to maintain the cat's—and owner's—quality of life during weight loss, and with OM Dry, the cat can eat a higher volume of food while reducing caloric intake.

• If the cat's BCS is 6 or below and he or she won't eat canned food, I recommend DM Dry Formula. This diet is extremely palatable and formulated specifically for cats with diabetes. This diet is also an appropriate option if the cat has a concurrent gastrointestinal issue that calls for a low-fiber, low-volume diet. It can also be a good choice for cats with advanced diabetes that have developed diabetic ketoacidosis and are reluctant to eat.

Whether the ultimate choice for a diabetic patient is a diabetic or a weight-loss diet in a canned or dry formulation will depend on both patient and owner factors. Given the importance of diet in managing cats with diabetes, it is worth the time it takes to carefully consider all of them.

¹ Pet Nutrition Alliance Calorie Calculators for Dogs and Cats. <https://www.petnutritionalliance.org/>. Accessed August 9, 2021.

² Frank G, Anderson W, Pazak H. Use of a high-protein diet in the management of feline diabetes mellitus. *Vet Ther. Summer 2001;2(3):238-46.*

Setting Client Expectations is Important in Diabetes Management



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Managing diabetic cats is always challenging for owners. By stressing the fundamentals of diabetes management and clearly establishing goals for their cats, I can give owners the confidence they need to dedicate themselves to the long-term management of their cats' condition.

STEP 1 Gain client commitment at each stage.

The at-risk cat. If a client comes to the clinic with a cat that is pushing 15 pounds or more, I'll tell them their cat is at high risk of developing diabetes and I explain what they need to do to get ahead of it. This typically includes portion control and meal feeding. If the cat is part of a multi-cat household, meal feeding can be tricky. I like to share my own story. I use a microchip feeder to house my thin cat's food and prevent my other cat from eating it. It helped my thin cat gain an appropriate amount of weight while it has kept my chowhound cat at 12 pounds, where he should be.

The diabetic cat. Once I confirm a cat has diabetes, it's important to be direct with clients. I tell them that managing diabetes can be time-consuming and expensive, but that if we can get the cat stabilized, regulation can follow fairly quickly. I advise clients to meal feed their cats and switch them to a therapeutic diabetic diet. My team also teaches the owner how to check blood glucose levels and administer insulin injections. Once owners get over the shock of the diagnosis and learn to administer insulin injections, they become more at ease with the diagnosis and confident in their ability to care for their diabetic cat.

STEP 2 Set goals for the patient and owner.

It's essential that clients understand that diabetes management requires a long-term commitment. Once the client is comfortable with the dietary and medical management of their cat, we can have a discussion about the

CASE STUDY

Weight loss and diet change helped this cat reverse course

Koda is a 10-year-old cat who had slowly but surely worked his way up to 19 pounds. Koda's owners are very dedicated, but have multiple cats, many of whom are older. Likely their attention was focused on their older cats and not so much on Koda, so his weight gain crept up on them.

At a routine appointment I did blood work on Koda due to his age and talked with his owners about his elevated weight and the potential for problems with that. All of his blood work was normal except for a glucose of 332, which I considered high due to stress or being prediabetic. Koda was asymptomatic for diabetes and there was no glucose in his urine. We added on a fructosamine which came back at 474, confirming prediabetes. Koda's owners wanted to get on this right away and I explained that if we could get a handle on the situation before Koda turned clinical, we could potentially reverse course.

I started Koda on Purina® Pro Plan® Veterinary Diets DM Dietetic Management® Feline Formula in March 2021. The owners were very strict about portion control. After the first month, he was down to 18.6 pounds and his glucose was 203. Three months after starting the diet, he weighed 16 pounds and his glucose was 112. He responded like gangbusters. The owners started feeding DM to their other cats as well and are very happy with the results.



potential for remission. However, if I discuss remission too early with certain clients, they may want to try managing the cat's diabetes with diet alone. My experience is that attempting that with a clinical cat can delay or even prevent remission.

I'm also careful to stress that while remission is possible for some cats, it is not necessarily the goal for every cat. My goal is a patient that will eat a diabetic diet; tolerate insulin injections; and have an owner who is able to be home to administer injections, meal feed and watch for any behavioral changes. If the owners can do this 90% of the time, the cat is likely to do very well—and may have a good shot at achieving remission.

Key Takeaways

- Genetic predisposition, body weight and body condition, diet, activity level, and the presence of comorbid conditions are among the many factors that can interact and lead to the development of feline diabetes over time. The more risk factors a cat has and/or the longer insulin resistance persists in any given cat, the higher the likelihood diabetes could develop.
- A number of considerations go into selecting the appropriate diet for a diabetic cat, including the cat's weight and BCS, weight-loss progress, canned or dry preferences, satiety, the presence of comorbid conditions, and owner preferences.
- Successfully implementing the basics when caring for a diabetic cat—administering insulin, feeding the appropriate amount of a diabetic diet and monitoring glucose levels—can stabilize and manage the disease. Remission is possible for some cats, but it's not necessarily the goal for every cat.

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