FHTC
Feline Hyperthyroid Treatment Center

Restoring Health & Happiness to Senior Cats

Treating Hyperthyroid Cats Since 1992
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www.felinehtc.com

Feeding Cats With Hyperthyroidism

When treating cats for hyperthyroidism, most of us focus on the treatment that best cures (I-131) or manages (methimazole) their disease. However, it's crucial to realize that nutrition plays an important role in their recovery. Aside from any remaining non-thyroidal illnesses, the most significant factor affecting a cat's recovery from hyperthyroidism is his diet.

In addition, dietary measures may help minimize the risk or recurrence of hyperthyroidism. Recent research identifies chemicals and ingredients in foods and packaging that disrupt endocrine function and are best avoided.

At the Feline Hyperthyroid Treatment Center, clients often ask,

"What's the best diet to feed my hyperthyroid cat?"

In order to answer this common question we need to keep 3 key points in mind:

- ***Our patients are obligate carnivores***
- ***They are aging***
- ***And they have a catabolic disease causing muscle-wasting***

  In other words, they're sick, old, carnivores, often dealing with added complications such as glucose intolerance or renal failure, each a factor influencing our patients' nutritional needs.

Any discussion about feline nutrition calls for a review of what carnivores need and why.

Carnivore Basics

Because cats have continued to capture their own food up until a half-century ago, there hasn't been much evolutionary push to change genetically from their efficient little desert ancestors living in the Fertile Crescent 10,000 years ago. Cats are still obligate carnivores that rely on nutrients in animal tissues to meet their specific and unique nutritional requirements. In the wild, a cat's normal diet of prey provides a high amount of meat-based protein (50-70%), with a moderate level of fat (30-50%) and less than 2% carbohydrates. They obtain most of their water from their diet as well.

Protein:

Cats are metabolically adapted to use protein and fats as **energy** sources, so they have an increased need for dispensable protein. This requires them to use protein to maintain their blood glucose levels, even when their diet lacks enough protein. Omnivores, such as humans and dogs, differ in that when fed a low-protein diet, they can conserve amino acids by reducing activities of enzymes involved in protein catabolism. They simply reduce their protein utilization, and use carbohydrates for energy. Cats can't make the switch; if cats don't have enough protein in their diets, they'll burn their own muscle for energy.

Cats also need **specific amino acids** in their diet: taurine, arginine, methionine, and cysteine. The likely reason that synthetic pathways for these amino acids, which are found in omnivorous species, are not found in cats is that they are redundant and, thus, energy inefficient. They don't need to make what they can eat. This may be 'metabolically efficient', but means that cats need to eat high amounts of these specific amino acids in their meat because they can't synthesize their own.

Not only do cats need more protein, it has to be **meat-based.** Plant-based proteins that work well for us omnivores do not contain the full complement of amino acids required by carnivores. Properly composed and utilizable amino acid sequences, found in meat, are referred to as high **biologic value (BV)** proteins. Meats are high biologic value for cats and plant proteins are low.

Carbohydrates:

Because cats don't naturally eat carbohydrates, they lack many enzymes and metabolic pathways needed to digest them very well.

For example, cats have no amylase in their saliva, and low activity of pancreatic amylase used to break down carbs in the intestines. They have no fructokinase needed to metabolize simple sugars. They also lack enzymes (glucokinase) and pathways responsible for converting glucose to glycogen for storage in the liver or muscles. As a result, cats are more hyperglycemic after high-carb meals, and carbs that aren't used for energy or stored as muscle glycogen are stored as fat. Cats on high-carb diets are more likely to have higher fat to muscle ratios, a greater tendency toward obesity, and are more likely to develop diabetes.

Fats:

In carnivores, fat provides a lot of the fuel for energy. It also increases palatability.

Meat-based diets, containing animal fats, supply essential fatty acids to cats, including linoleic, linolenic and arachodonic acids, precursors for prostaglandins and leukotrienes.

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Sarcopenia of Aging

Cats lose muscle mass as they age. Age-related muscle loss is referred to as sarcopenia, from the Greek "poverty of flesh". This is due both from an increased energy requirement in older cats, as well as a reduced ability to digest protein. If old cats don't eat enough protein, they waste more quickly.

Hyperthyroidism is a Catabolic State

With 'run-away train' metabolisms, these cats simply burn calories faster than they can eat them, and resort to catabolizing (breaking down) their own muscle. This is first noticed as a loss of muscle over the spine.

Because many hyperthyroid cats eat ravenously, they may even gain a little weight in the initial stages of the disease, expressed as a higher overall body condition score (BCS). These cats may retain their belly fat despite steady muscle wasting. Therefore, muscle condition scores (MCS) more accurately reflect these hyperthyroid cats' lean body conditions than overall body condition scores (BCS), which include fatty weight.

Eventually, the muscle wasting accelerates and they lose any remaining fat, resulting in generalized emaciation. The heart also suffers thyrotoxic insult, making it reasonable to assume that sufficient quantities of high BV proteins could aid remodel and repair of cardiac muscle after resolution of thyroid disease via I-131.

It's Complicated: Other Issues in Hyperthyroid Cats Affecting Nutritional Needs

Prediabetes

In addition to their catabolic state, hyperthyroid cats commonly develop changes in glucose and insulin metabolism. Frequently, insulin resistance and reduced secretion lead to a pre-diabetic state. Even if this isn't recognized (commonly mistaken for "stress hyperglycemia") or remains subclinical, it does impact the nutritional needs of the hyperthyroid cat. Occasionally, an untreated hyperthyroid cat will develop overt diabetes mellitus, which is more difficult to control. Some cats develop diabetes after the hyperthyroidism is corrected because the alterations in glucose tolerance and insulin secretion can't always be reversed completely, especially if the cat is allowed to become overweight once the metabolic rate decreases to normal.

Secondary Renal Hyperparathyroidism

30-50% of hyperthyroid cats develop hyperphosphatemia, and about 60% have elevated parathyroid hormone levels, perhaps due to underlying and often masked CKD. In turn, both high phosphorus and high PTH levels caused by secondary renal hyperparathyroidism accelerate renal degeneration.

Non-thyroidal Illnesses

Hyperthyroid cats often have concomitant non-thyroidal illnesses (NTI's), such as CKD or independent GI diseases, each with their own dietary considerations. Combine the nutritional demands of hyperthyroidism with those of any non-thyroidal disease(s) the cat may be dealing with, and it becomes clear how important a nutritional strategy becomes.

Nutritional Strategy: What Should We Feed These Cats?

Although it's difficult to duplicate natural diets of prey with commercial cat foods, we should strive toward this model, expressed in terms of percentage of metabolizable energy (ME) calories, on a dry matter basis. The diet should be balanced in this way:

>40% meat-based protein, ~50% fat, <10% carbohydrate = 100% calories

High Amounts of Meat-based Protein

Even with the treatment of hyperthyroidism, recovery of muscle may be prolonged, taking weeks to months. Restoring muscle in old cats with long-lasting alterations in glucose metabolism requires a diet rich in high biologic value (meat-based) protein, ideally for the rest of their lives.

Animal protein is more expensive than plant protein, fat, and carbohydrate sources (grains, fruits and vegetables). Therefore, many canned and ALL dry cat foods include high amounts of plant-origin proteins and inadequate amounts of meat. Diets using whole grains, glutens, and soy have a portion of their protein coming from low biologic value sources.

Low Carbohydrates: No Fruits, No Vegetables, No Grains

Because many cats recovering from thyroid disease still have subclinical diabetes, with continued glucose intolerance and insulin resistance even after the HT4 is corrected, a diet low in carbohydrates (<10% ME) is even more important.

Feeding a low carb diet lessens hyperglycemia, improves insulin sensitivity, and helps stabilize glucose metabolism in these cats, reducing the chance of diabetes mellitus.

"Grain-free" does not necessarily mean "low-carb." Potatoes, peas, and soy are often used in "grain-free" products. The easiest way to avoid carbohydrates in cat foods is to select foods containing no fruits, vegetables or grains.

The composition of almost all dry cat diets are much too high in carbohydrates and plant-based proteins, and are too low in meat-based proteins. Therefore, any canned is better than any dry, and it's best to feed no dry at all.

Energy Dense, High Fat, but not TOO many calories

About half of a canned cat food diet is animal fat. For thin cats, this energy density helps, but after the thyroid disease is cured, and the cat resumes a more normal metabolism and weight, overall calories need, yet again, to be monitored to ensure the cat doesn't become overweight.

Low Phosphate

Because about 30% of the hyperthyroid cats we treat at the FHTC have some degree of renal insufficiency, a diet low in phosphorus is recommended. Restricting phosphorus in these cats can reduce PTH concentrations and improve survival time.

Ideally, cat foods should contain <250 mg Phosphate/100 kcal. Unfortunately this is only rarely accomplished in higher protein foods, and a high protein/low phosphorus food has yet to be formulated.

What About Cats With Chronic Kidney Disease?

We do not recommend renal failure diets for cats in earlier (IRIS stage 1-2) CKD.

We agree that higher protein foods are more likely to result in higher nitrogen waste product (BUN and creatinine) levels. However we do not believe that high protein in cats, accelerates the progression of the renal failure. We typically don't protein-restrict cats until they are in later stages of renal failure, at which time sacrificing protein in order to lessen 'unlivable' levels of azotemia becomes the priority.

None of the commercial kidney diets meet the recommendations for higher protein, which remains: no less than 40% ME calories as meat protein (12 g/100 kcal food).

Protein content of some common protein-restricted diets are: Hills K/D® = 22 %, Purina NF®=27 %, Royal Canin Renal LP= 21 %, Hill's y/d®=27 %

Therefore, we recommend continuing to feed CKD cats high-protein canned or raw diets until the BUN > 50 and/or the creatinine > 3 mg/dl.

In cats with earlier stages of CKD, phosphorus should be restricted using methods other than changing to a low protein diet.

Is it safe to feed an iodine deficient diet (Hills y/d®) to hyperthyroid cats?

Hill's y/d® includes at least two of the dietary factors that appear to contribute to the development of hyperthyroidism including overt iodine deficiency and soy isoflavins that act as goitrogens.

"In light of our increasing awareness that iodine deficiency likely plays a role in the development of hyperthyroidism in cats, how advisable is it to feed a dramatically iodine deficient diet to cats that have already developed thyroid tumors? Minimally, we know that this diet does nothing to prevent the continued growth of the tumors responsible for hyperthyroidism in cats." Mark Peterson, DVM, ACVIM

"There is little doubt that feeding Hill's new iodine deficient diet y/d® has the potential to lower circulating thyroid hormone levels in hyperthyroid cats. The real question is whether a severely iodine deficient diet is the way to achieve "Thyroid Health". With what we know about the potential causes of hyperthyroidism in cats combined with the basic nutritional needs of the feline species it appears that a low protein, high carbohydrate, plant based, iodine deficient cat food is the epitome of what some have called "tunnel vision" nutrition"."

Mark Peterson, DVM, ACVIM, Animal Endocrine Center, NYC: Dr. Peterson served as head of endocrinology and nuclear medicine at The Animal Medical Center for over 30 years. Dr. Peterson has become renowned for advancing the world's understanding of feline hyperthyroidism.

May Dietary Measures Actually Help *Prevent* Hyperthyroidism?

There are numerous nutritional and environmental factors that may be involved with the pathogenesis of hyperthyroidism. Thyroid disruptor chemicals or goitrogens most likely act together to affect thyroid hormone metabolism, leading to thyroid tumors and resulting hyperthyroidism. It is quite possible that avoiding certain goitrogenic ingredients or chemicals in cat foods and packaging could help prevent thyroid disease.

It may be best to avoid:

Ultra-high or ultra-low IODINE diets: both excesses and deficiencies in iodine lead to thyroid disease. Fish and kelp contain a lot of iodine. Hill's y/d® is iodine deficient.

SOY: Many food manufacturers include soy flours or "soybean mill run" to bolster protein percentage in cat foods. Plant proteins aren't required or metabolized as efficiently as meat proteins by cats, and soy isoflavins are goitrogenic, so soy-containing cat foods should be avoided. Soy also contains enzyme inhibitors that impede normal protein digestion.

Can linings: almost all food cans are coated with epoxies containing bisphenol A, a known goitrogen. Some companies limit BPA, and smaller cans are less likely to be lined with BPA than are larger cans. BPA-free cans are ideal, but uncommon.

Plastic food bowls and storage containers: often contain BPA, which leaches into the food, especially if it is heated (microwaved) in the container.

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INSIDE: Feeding Cats with Hyperthyroidism

Fish: fish contain higher amounts of iodine and may be contaminated with PCB's, PBDE's, dioxins, DDT, mercury, perfluorinated compounds, and other chemicals commonly found in our Western environments. In fact, fish tend to biomagnify (build up) chemicals.

In summary, our answer to your client's query:

"What's the best diet to feed my hyperthyroid cat?"

The best diet for your hyperthyroid cat satisfies his/her nutritional requirements as an aging carnivore recovering from a muscle-wasting disease, and avoids substances that may contribute to thyroid disease. ***We encourage you to read cat food labels and consider these guidelines.***

It is best to feed:

Canned or raw diets, that contain little to no fruits, vegetables, or grains. Any canned cat food is better than any dry, which contains too much carbohydrate and plant-based protein. Meat by-products are fine for carnivores: they're simply protein sources such as organ meats and entrails that people don't find appetizing. Gravy foods tend to be high in carbs, so pates are a better choice.

Motivated clients may check out the website (www.catinfo.org), which gives nutrient breakdown of various prescription and over-the-counter diets in the link "Protein/Fat/Carbs Chart". An acceptable composition is:

>40% meat protein, 50 % fat, <10 % carbs, <250 mg/100kcal phosphate

Note: these percentages are based on dry matter, metabolizable energy, unlike those on the can label

It may be best to avoid:

- SOY-containing foods
- BPA in canned food linings
- Fish
- Plastic food and water bowls (replace with glass, ceramic or metal)
- Storing food in plastic containers
- Ultra-high or ultra low iodine diets

What should we be telling our clients?

Aside from curing their cat's hyperthyroidism with I-131, one of the most important factors in their cat's recovery is nutrition. We believe these cats should eat diets high in meat-based proteins, with little to no fruits, vegetables or grains. We are also learning that avoiding substances that disrupt endocrine function may actually help prevent hyperthyroidism.

We strive to work with you to build a plan to recover these cats. We respect your clinical expertise. If there is anything we can do to improve our services, we appreciate your feedback.

Faythe Vaughan, DVM and Dennis Wackerbarth, DVM

Upcoming Newsletters:

Etiology of Hyperthyroidism • Other Considerations: Optimizing Recovery After I131
Methimazole Trials: What Are They Good For?

We're available to consult about these topics any time – please contact us if you have any questions.

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