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Feline Nutrition

Feeding Your Cat: Know the Basics

Diet is the foundation of health. Cats have a better chance at optimal health if they are fed a quality canned diet instead of dry kibble. Putting small amounts of effort into your cat's diet can pay big dividends over his lifetime by possibly avoiding serious and costly illnesses. An increasing number of American Veterinary Medical Association members are now strongly recommending feeding canned cat food over dry kibble.

The three key negative issues associated with dry food are:

- 1) type of protein - too high in plant-based vs animal-based
- 2) carbohydrates are too high
- 3) water content is too low

But My Cat is "Fine" on Dry Food!

Every creature is "fine" until outward signs of a disease are exhibited. That may sound obvious but think about it..... Every cat with diabetes was "fine" until his owners recognized the signs.

Every cat with a blocked urinary tract was "fine" until he started straining to urinate and either died from a ruptured bladder or was hospitalized.

The point is that diseases "brew" long before outward signs are noticed; ideally disease can be avoided through cautionary measures instituted early in life. This is called **preventative nutrition (medicine)** – not locking the barn door after the horse is gone.

To understand the 'preventative nutrition' argument, one must understand that carbohydrates wreak havoc on cats' blood sugar/insulin balance, that all urinary tract systems are healthier with an appropriate amount of water flowing through them, and finally, that cats are strict carnivores which means they are designed to get their protein from meat.

Cats Need Animal-Based Protein

Cats are strict carnivores and are very different from dogs in their nutritional needs. Your cat is designed to meet her nutritional needs by the consumption of a large amount of meat/organs and derives much less nutritional support from plant-based proteins. This means that cats lack specific metabolic pathways and cannot utilize plant proteins as efficiently as animal proteins.

Not all proteins are created equal! Animal proteins have a complete amino acid profile (the building blocks of proteins), meaning that all the protein requirements of a carnivore will be met. Plant-based proteins do not contain this full complement of critical amino acids required by a carnivore. The quality and composition of a protein is referred to as its biological value.

Humans and dogs can take the amino acids in the plant

protein and, from those, make the missing pieces. Cats cannot do this. This is why humans and dogs can live on a vegetarian diet but cats cannot.

Taurine is one of the most important amino acids that is present in meat but is missing from plants. Taurine deficiency will cause blindness and heart problems in cats. The protein in dry food, which is often heavily plant-based, is not equal in quality to the protein in canned food, which is meat-based. The protein in dry food, therefore, earns a lower biological value score.

Because plant proteins are cheaper than meat proteins, pet food companies have a higher profit. Pet food company representatives argue that they know *exactly* what is missing from a plant. They claim that these missing elements are added to the diets to make them complete to sustain life in an obligate carnivore.

The problem is that we are not always infallible and have made fatal errors in the past when trying to compensate for such a drastic deviation from nature. Not all that long ago (1980s) cats were going blind and dying from heart problems due to errors of ignorance. It was discovered that cats are exquisitely sensitive to taurine deficiency. Pet food companies started supplementing dry diets with taurine. This solved this particular problem - but how do we know that we are not unaware of another critical nutrient that is missing?

Do cats **survive** on these supplemented plant-based diets? Yes, many of them do. Do cats **thrive** on these diets? No, they do not.

We Feed Cats Too Many Carbohydrates

In their natural setting, cats would not consume the high levels of carbohydrates (grains) found in the dry foods that we routinely feed them. Your cat would be eating a high protein, high-moisture content, meat-based diet, with a moderate level of fat and with only approximately 3-5% of her diet consisting of calories from carbohydrates.

The average dry food contains 35-50% carbohydrate calories. Some cheaper dry foods contain higher levels. A high quality canned food contains approximately 3-5% carbohydrate calories. Please note that not all canned foods are suitably low in carbohydrates. For instance, most of the Hill's Science Diet and the Hill's Prescription diets are very high in carbohydrates and are not foods that I would choose to feed.

Cats have no dietary need for carbohydrates and, more worrisome is the fact that a diet that is high in carbohydrates can be detrimental to their health. With this in mind, it is as illogical to feed a carnivore a steady diet of meat-flavored grains as it would be to feed meat to a vegetarian like a horse. So why are we continuing to feed our carnivores like herbivores? Grains are cheap. Dry food is convenient. Affordability and convenience sell. However, is a

carbohydrate-laden, plant-based, water-depleted dry food the best diet for our cats? **NO**
In the long run, I would argue that any up front cost-savings from a dry diet are lost due to veterinary expenses incurred in treating health problems that develop secondary to the poor quality diet.

Cats Need Lots of Water

Water is a vital nutrient that contributes to overall health. Couple this with the fact that cats do not have a strong thirst drive and you will understand why it is critical for them to ingest a water-rich diet. The cat's lack of a strong thirst drive leads to low-level, chronic dehydration when dry food makes up their diet.

Cats are designed to obtain most of their water with their diet since their normal prey contains about 75% water. Dry foods only contain 7-10% water whereas canned foods contain approximately 78% water. Canned foods more closely approximate the natural diet of the cat and are better able to meet her water needs.

A cat consuming a predominantly dry-food diet does drink more water than a cat consuming a canned food diet, but in the end, when water from all sources is added together the cat on dry food consumes about half the water compared with a cat eating canned food.

This is a crucial point when considering how common kidney/bladder problems are in cats.

When your cat starts eating a more appropriately hydrated diet of canned food, his urine output will increase significantly, which is a very good thing for bladder health. Think of canned food as 'hosing out' your cat's bladder. Given this increase in urine output, litter boxes need to be scooped daily or more boxes need to be added to the home.

Common Feline Health Problems

Diabetes: Diabetes is a serious, and difficult to manage, disease that is not uncommon in cats. We do not know all of the causes of this complex disease but what we do know is that many diabetic cats cease needing insulin or have their insulin needs significantly decrease once their dietary carbohydrate level is decreased to a more species-appropriate level.

Given this fact, and given what we know about how the cat processes carbohydrates, it is not a stretch to say that high carbohydrate diets could very well be causing diabetes in some cats.

In addition to the issue of carbohydrates and how they raise the blood sugar level of cats, dry food is very calorie dense and is usually free-fed, which can lead to obesity.

Fat cells produce a substance that makes the other cells in the body resistant to insulin. This promotes the diabetic state.

Kidney Disease (CKD): Chronic kidney disease is probably

the leading cause of mortality in the cat. It is troubling to think about the role that chronic dehydration may play in causing or exacerbating feline kidney disease. The prescription dry 'renal diets' contain only a small amount of moisture (~10% versus 78% for canned food) leaving your cat in a negative state of water balance.

Cystitis (Bladder inflammation), Bladder/Kidney Stones, Urethral Blockage: Cystitis refers to inflammation (with or without infection) of the bladder wall. We do not fully understand all of the causes of this painful disease but we do know that it is strongly linked to stress and the water content of the diet.

It is very common for a cat to have cystitis without an infection. This is known as "sterile cystitis". In fact, most cases of cystitis are sterile. In other words, they are not the result of an infection and should not be placed on antibiotics.

Facts: Only ~1-2% of cats with cystitis that are under 10 years of age have a urinary tract infection. This means that ~98% of these patients do not need antibiotics. In cystitis patients over 10 years of age, infections are more common (~20-30% vs ~1-2%) but that still does not mean that older cats with cystitis should automatically be put on antibiotics. Note that 70+% of these patients have sterile cystitis. So how do we determine if the patient has an infection or not? A culture & sensitivity lab test (C & S) identifies the bacteria (if present) and tells the veterinarian which antibiotic is appropriate. This test is run in an outside laboratory and takes ~3 days to get final results.

As stated above, we know that stress plays a critical role in causing inflammation of the feline bladder.

Cystitis is very painful. Pain => stress and stress => cystitis. Consequently, it is important to address pain management. Buprinex is a good choice for a pain medication.

Cystitis often leads a cat to start urinating outside of the litter box due to an association of the litter box with their pain. This is called a "litter box aversion". Therefore, it is also vital for the cleanliness of the home to do whatever we can to avoid a litter box aversion.

The water content of the diet is easy to control – feed canned food with added water as noted below.

Adding 1-2 TBS of water (plain or flavored – such as tuna water) per meal of canned food is very beneficial, as is using water fountains. Make your own tuna water by taking one can of tuna and mixing the contents into 3 cups of water.

Mash it around and let it sit for ~20 minutes. Pour the water into covered ice cube trays. Freeze to prolong the freshness. Use covered trays to keep the water tasting and smelling fresh.

Any cat that is repeatedly entering the litter box but not

voiding any urine is in need of IMMEDIATE medical attention!

Obesity: Obesity is an extremely common and serious health problem in cats. Overweight cats are four times more likely to develop diabetes. Obese cats are more prone to orthopedic problems and often cannot clean themselves properly. Carbohydrates are minimally used for energy by cats and those that are not used are converted to and stored as fat. The so-called "light" diets that are on the market have targeted the fat content as the nutrient to be decreased. An optimal weight loss diet should be high in protein (over 40% of calories), moderate in fat (under 50% of calories), and low in carbohydrates (under 10% of calories). In several studies, cats fed a high protein/low carbohydrate diet lost weight but maintained their lean body mass in comparison to cats fed a high carbohydrate/low fat diet.

Dental Disease: Long-standing claims that cats have less dental disease when fed dry food versus canned food are grossly overrated, and are not supported by recent studies. The idea that dry food promotes dental health makes as much sense as the idea that crunchy cookies would promote dental health in a human.

First, dry food is hard, but brittle, and merely shatters with little to no abrasive effect on the teeth. Second, a cat's jaws and teeth are designed for shearing and tearing meat, not biting down on dry kibble. Third, many cats swallow most of their dry food whole.

There are many factors, known and unknown, that contribute to dental disease in the cat such as genetics, viruses, diet, and the fact that cats do not brush their teeth like humans do. One obvious answer is that we feed the cat a diet so different from its natural diet.

When cats consume their prey in the wild, they are tearing at flesh, hide, bones, tendons, and ligaments. This is a far cry from the consistency of dry or canned food. Brushing teeth, by far, is the best way to promote your cat's dental health. Google 'Cornell brushing your cat's teeth' for a great instructional video. Please pay close attention to the statement in the video regarding a **thorough dental exam by your veterinarian before starting a brushing program.**

Many cats have painful mouths but show no outward signs of this. If you try to brush your cat's teeth in the face of a painful mouth, all you will end up with is a cat that is scared and has a strong aversion to toothbrushes. If this aversion occurs, you may never get him to accept tooth brushing. First address the painful mouth with your vet.

Please understand that I am not saying that canned food is necessarily better for teeth than dry food. For optimal dental health, a cat should not be eating either canned or dry food but we have to work with what is practical in a typical home setting and feeding a cat a 'whole carcass prey' diet is not

terribly practical, even if it would be great for their teeth. The compromise is to give them some muscle meat to chew on, in addition to brushing their teeth.

Transitioning to Canned Food

The best time to implement a diet change is when the cat is healthy. Trying to get an ill cat to embrace a new food can be problematic. Sick cats are often not consuming enough calories; this is not the time to push a diet change with too much intensity.

For diabetic patients, it is very important to decrease their carbohydrate consumption (to less than 7-10% of their daily caloric intake) while keeping in mind that as dietary carbohydrates are lowered so will the insulin needs for nearly all cats. If this fact is not considered, with the insulin lowered accordingly, a dangerous hypoglycemic (low blood sugar) state may occur. This should be discussed with your veterinarian.

It is critical for diabetic patients to consume enough total calories per day to help prevent the onset of diabetic ketoacidosis (DKA). This does present a more challenging situation, but not an impossible one.

Vacations and jobs that demand long working hours are often used as reasons for free-feeding dry food to cats. With regard to pet-sitters, cats need to be checked on daily to clean their litter box and to make sure that all is well.

Let's say that you are going to be gone for 1 week. Freeze 7 meals and have your once-a-day pet-sitter put out two meals at each visit – one meal that hasn't been frozen (room temperature canned food) and one that is frozen. The freshness of the frozen meal will be prolonged and your cat will be fine until your sitter returns. The same trick can be used if you are working long hours or live in a hot climate.

There are few things in life more frustrating than dealing with a finicky cat. Cats, like children, often resist what is best for them. The two most frequent comments that I hear from people when trying to convince them to feed their cats a healthier diet are "my cat won't eat canned food" and "but my cat really likes his dry food." Children really like potato chips and ice cream but that certainly does not mean those food items constitute optimal nutrition. The transition process often involves much more than just plunking down a new food item. Time, patience, and tricks are often required.

Some Tips to Making the Switch

The single biggest mistake I see people make is to say that their cat "won't touch" the new food and then panic and fill up the bowl with dry food. There are two categories of cats - those that will eat canned food and those that will be extremely resistant. If your cat has been on all dry food, or only receives canned food as an occasional 'treat', start by feeding canned food in increasing amounts. Gradually

decrease the dry, taking about a week to fully switch the cat over to 100 percent canned food.

Some cats may experience softer stools during the transition. I do not worry if this happens and tend to 'ride it out'. If diarrhea results from the diet change you will either need to experiment with different canned foods or slow the transition down and do it over a period of several weeks.

Another complaint that I often hear is that cats often regurgitate their canned food shortly after ingesting it. I confess that in the otherwise-healthy cat, I do not understand why cats do this. One of my own cats did this for many weeks after the transition – and then she stopped.

The average cat should eat 4-6 ounces of canned food per day split between 2-3 meals but this is just a general guideline. When determining how much you should be feeding your cat once transitioned to canned food, keep it simple. Too fat? Feed less. Too thin? Feed more.

For 'resistant-to-change' cats, you will need to use the normal sensation of hunger. For this reason, it is very important to **stop free-feeding** dry food. This is the first, and critical, step. You need to **establish set mealtimes**. They are not going to try anything new if their bowl of dry food is in front of them 24/7. Cats do not need food available at all times.

This is where many people fail and give in by filling the dry food bowl when their cats act hungry. On the other hand, do not attempt to withhold food for long periods of time (greater than 24 hours) with the hope that your cat will choose the new food. Allowing a cat to go without food for a long period of time can be quite dangerous and may result in hepatic lipidosis (fatty liver disease).

Hepatic lipidosis can also develop when a cat consumes ~50% or less of his daily caloric requirements over a period of many days. For this reason you need to have some idea of the calories from canned food combined with the calories from dry food that your cat is consuming on a daily basis while you are implementing the transition to canned food. Or, if you have a multiple-cat household that makes it difficult to know how much each cat is consuming, I suggest weighing the transitioning cat daily.

I have never seen a cat develop hepatic lipidosis when consuming at least 15 calories per pound per day. This number is figured on lean body weight, not fat weight. If your cat weighs 18 pounds but really should weigh 12 pounds, please make sure that he is consuming at least ~180 calories per day. (12 pounds lean body mass X 15 calories/pound/day = ~180 calories/day)

Canned foods never list the calorie content but many dry foods do list this information. A rough guideline for the calorie content of most canned foods that are 78% moisture is ~30 calories/ounce but can range from 20 to 40

calories/ounce.

Most cats will lose some weight during the transition to canned food. Given that a high percentage of cats are overweight, this is a favorable result - as long as they do not lose too much weight too fast. A cat should never lose more than 1-2% of his body weight per week. I highly suggest that all cat caregivers weigh their cats periodically – daily if you are not able to monitor food consumption.

Some tricks for the stubborn cats

- If your cat has been eating dry food on a free-choice basis, take up the food and establish a schedule of 2 - 3 times per day feedings. I prefer twice-daily feedings. A normal, healthy hunger response after 12 hours helps to convince them to try something new.

Once the cat has transitioned to canned food, I prefer to either free-feed them (if they are not too fat) or to put out a meal 3 times per day. Small cats in the wild eat 8-10 small meals per day. I do not worry about leaving canned food out for up to 12 hours at a time.

If you want to take the transition very slowly, you can feed the amount that your cat normally consumes in a 24 hour period - split up into two feedings to get him used to meal feeding. Many people are unsure how much their free-fed cat really eats so I would start off by figuring out the calories that your cat needs to maintain his weight - if he does not need to lose any weight – and then divide that in half for the AM and PM feedings. Again, most cats only need 150-250 calories/day.

Leave the dry food down for 30 minutes, and then remove any uneaten portion. Repeat in 8 -12 hours depending on if you are feeding 2 or 3 times per day. During the first few days of transitioning to a set schedule, you can offer canned food during the dry food meals, or in-between meals. The stubborn ones, however, will not touch it. Do not despair - all cats will eventually eat canned food if their caregiver is determined and patient.

- Once you have established scheduled mealtimes, you will most likely need to start feeding a bit less at each mealtime in order to get the normal sensation of hunger to work in your favor. Again, we are trying to use this hunger to help us out. We are not trying to starve the cat into the diet change.

- Once your cat is on a schedule of meal-feeding instead of free-feeding, try feeding a meal of canned food only. If he will not eat it try not to get frustrated - and do not put down dry food. Try some of the other tips listed below. If he still will not eat the canned food, let him get a bit hungrier. Offer the canned again in a couple of hours – or just leave it out. Some cats will be more apt to try something new if they keep walking by it and seeing/smelling it. Try a different brand/ flavor or a different 'trick'. Once it has been ~18

hours since he has eaten anything, give him just a small amount (~1/4 of a cup) of his dry food – keeping track of his daily calorie intake.

- Exercising your cat with a tassel toy before feeding can also help stimulate his appetite.
- Instead of putting the dry food portion in his bowl, turn it into a game. Throw the dry food, one or two pieces at a time across the room so that he has to run back and forth and ‘hunt’ for it. This trick worked very well for my obesity project, Bennie. Bennie went from 30 lbs to 18 lbs once on portion controlled canned food. Playing the ‘toss the dry food portion’ game will help your cat burn off calories and should stimulate his appetite so that he may be more inclined to try canned food. It is also a great way to interact with your cat.
- Cats’ noses are much more sensitive than ours. They can smell the dry food in the cupboards. I suggest putting it in the refrigerator or at least putting it in a tightly sealed container. If they can smell it, they’ll wait for it.
- Pet your cat while he is in front of the food bowl. Some cats will be stimulated to eat when being petted.
- The following worked for my cats: Sprinkle a very small amount of tuna – or any other favorite treat (some cats would prefer cooked chicken) - on the top of the canned food and then once they are eating this, start pressing it into the top of the new food. Be careful to decrease the amount of fish as soon as possible. Health problems can occur with a predominantly fish-based diet.
- Make sure that any refrigerated canned food is warmed up a bit. Cats prefer food at ‘mouse body’ temperature.
- Try offering some cooked chicken or meat baby food. One of the goals is to get your cat used to eating food that does not crunch. If he eats the chicken, he may head right into the canned food.
- Try sprinkling some Parmesan cheese on the canned food. This trick has been very successful for me.
- Try a product called FortiFlora. This product can be obtained from your veterinarian or online. Most cats love FortiFlora and this has recently become my favorite trick. This is a probiotic, but you are just going to use it as a flavor enhancer. The base ingredient in FortiFlora is animal digest - the very substance that makes dry food so very enticing to cats. You may only need ~1/4 of a package - or less - with part mixed into the food and part sprinkled on top of the food.
- A common question is “can I just soak the dry food in water?” Dry food often has a high bacterial content. Mold is also often found in dry food. There have been many deaths of dogs and cats secondary to eating mold mycotoxins, vomitoxins and aflatoxins which often contaminate the grains found in dry food. If you want to try the trick of

wetting down the dry food to alter the texture, please leave it out for only 20 minutes then discard it. Bacteria and mold thrive in moisture.

- Try dipping some dry food pieces in the juice from the canned food. If he will eat it with a bit of canned juice on it, try the ‘chip and dip’ trick. Scoop up a tiny bit of canned food onto the piece of dry food. Put them on a separate plate from the portion of dry food
- Going one step further, try adding a few small pieces (the size of an eraser head) of the canned food to the portion of dry food. Your cat may pick around the canned food but will get used to the smell - and texture - even if he does not eat any pieces of the new food.
- Crush some dry food and sprinkle it on the top of the canned food.
- If you do not think it will upset your cat, try gently rubbing a bit of canned food or juice on the cat’s gums. This may get him interested in the taste and texture of the new food - but do it gently. You do not want to make this a stressful situation and create a food aversion.
- If you have a multiple cat household, some cats like to eat alone in a less stressful environment, so you may need to take these cats into a separate, quiet room. Once in a quiet setting away from the other cats, two of my cats would eat canned food/tuna ‘meatballs’ by hand. Not from a bowl, mind you, but only from my hand. They did eventually start eating from a bowl after a few hand feedings.
- Try various brands and flavors of canned foods. Try Friskies, 9-Lives, Fancy Feast, etc. Many cats love the foods that are all by-products and turn up their noses at the ‘higher end’ foods like Merrick, Wellness, Nature’s Variety, etc. You can worry about feeding a higher quality canned food later and you can always mix different types of food together. The initial goal is just to get your cat used to eating canned food. And keep in mind that it is better to feed Friskies or 9-Lives canned food than any dry food because, even though they are made up of by-products, they have the Big Three covered: 1) high in water, 2) usually low in carbohydrates, 3) animal-based proteins – not plant-based.

Some Final Thoughts

If you have made it to this point in this article, you must really care about feeding your cat a healthy diet and are open to new ideas regarding their nutritional needs.

Cats do not need, nor benefit from, any dry food in their diet. They also do not need constant access to food.

Everyone’s lives are different and there are several ways to successfully feed your cat high quality nutrition. The goal of this paper is to arm you with knowledge about the special dietary needs of your cat so you can make an informed decision on how and what to feed while striking a balance

that works for both of you.

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