
Feeding Your Cat: Know the Basics of Feline Nutrition

Lisa A. Pierson, DVM

www.catinfo.org

This handout is a very abbreviated review of several detailed articles which can be viewed at catinfo.org. The online pages also contain helpful links and pictures.

Diet is the brick and mortar of health. This paper lays out some often-ignored principles of feline nutrition and explains why cats have a better chance at optimal health if they are fed a *quality canned food diet instead of dry kibble*. Putting a little thought into what you feed your cat(s) can pay big dividends over their lifetime and very possibly help them avoid serious, painful, and costly illnesses. An increasing number of American Veterinary Medical Association members, including board-certified veterinary internists, are now strongly recommending the feeding of canned food instead of dry kibble.

The three key *negative* issues associated with dry food are:

- 1) type of protein - too high in plant-based versus animal-based proteins
 - 2) carbohydrate load is too high
 - 3) water content is too low
-

Topics

- But my cat is "fine" on dry food!
- The importance of animal **proteins**, versus plant proteins
- Problems with **carbohydrates** in dry cat foods
- Cats need **water with their food** – This is one of the most important sections in this handout.
- Reading a pet food ingredient label - See www.catinfo.org – 1) *Feeding Your Cat* and 2) *Commercial Canned Food*
- Common medical problems associated with dry food
- The safety of dry food
- Tips for Transitioning - Getting dry food addicts to eat canned food
- Home prepared and commercial raw – or semi-cooked - meat diets
- Some final thoughts/What I feed to my own cats

My Cat is Doing Just "Fine" on Dry Food!

Every living creature is “fine” until outward signs of a disease process are exhibited. That may sound like a very obvious and basic statement but if you think about it.....

Every cat on the Feline Diabetes Message Board was “fine” until their owners started to recognize the signs of diabetes.

Every cat with a blocked urinary tract was “fine” until they started to strain to urinate and either died from a ruptured bladder or had to be rushed to the hospital for emergency catheterization.

Every cat with an inflamed bladder (cystitis) was “fine” until they ended up in pain, passing blood in their urine, and missing their litter box.

Every cat was 'fine' until the feeding of species-inappropriate, hyperallergenic ingredients caught up with him and he started to show signs of food intolerance/IBD (inflammatory bowel disease).

Every cat was "fine" until that kidney or bladder stone got big enough to cause clinical signs.

Every cancer patient was "fine" until their tumor grew large enough or spread far enough so that clinical signs were observed by the patient.

The point is that diseases 'brew' long before being noticed by the living being.

Do *all* cats become overtly ill when eating a species-inappropriate diet of dry food? Of course not, but many of them do. This is why the statement "but my cat is healthy/fine on dry food" means very little to me because I believe in **preventative nutrition** - not locking the barn door after the horse is gone. I don't want to end up saying "oops.....I guess he is not so fine now!!" when a patient presents to me with a medical problem that could have been avoided if he would have been feed a species-appropriate diet to begin with.

Of course, in order to be on board with the 'preventative nutrition' argument, a person has to understand the fact that carbohydrates wreak havoc on many cats' blood sugar/insulin balance, that *all* urinary tract systems are much healthier with an appropriate amount of water flowing through them, that cats inherently have a low thirst drive and need water *with* their food, and finally, that cats are strict carnivores which means they are designed to get their protein from meat – not plants.

Cats Need *Animal-Based Protein*

Cats are obligate (strict) carnivores and are very different from dogs in their nutritional needs. What does it mean to be an 'obligate carnivore'? It means that your cat was built by Mother Nature to get her nutritional needs met by the consumption of a large amount of **animal-based proteins** (meat/organs) and derives much less nutritional support from **plant-based proteins** (grains/vegetables). It means that cats lack specific metabolic (enzymatic) pathways and cannot utilize plant proteins as efficiently as animal proteins.

It is very important to understand that not all proteins are created equal.

Proteins derived from animal tissues have a complete amino acid profile. (Amino acids are the building blocks of proteins. Think of them as pieces of a puzzle.) Plant-based proteins do not contain the full compliment (puzzle pieces) of the critical amino acids required by an obligate carnivore. The quality and composition of a protein (are *all* of the puzzle pieces present?) is also referred to as its **biological value**.

Humans and dogs can take the pieces of the puzzle 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. (Note that I do *not* recommend vegetarian diets for dogs.)

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 will have a higher profit margin when using corn, wheat, soy, rice, etc.

Veterinary nutritionists and pet food company representatives will argue that they are smart enough to know *exactly* what is missing from a plant in terms of nutrient *forms* and *amounts* - nutrients that would otherwise be in a meat-based diet. They will then claim that these missing elements are added to their diets to make it complete and balanced to sustain life in an obligate carnivore.

The problem with this way of thinking is that Man is just not that smart and has made fatal errors in the past when trying to guess how 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 Man's arrogance. It was discovered in the late 1980s that cats are exquisitely sensitive to taurine deficiency and our cats were paying dearly for Man straying so far from nature in order to increase the profit margin of the pet food manufacturers.

There are several situations that can lead to a diet being deficient in taurine but one of them is using a diet that relies heavily on plants as its source of protein. Instead of lowering their profit margin and going back to nature by adding more meat to the diets, the pet food companies simple started supplementing their diets with taurine.

This is all well and good - for this particular problem - but how do we know that Man is not blindly going along unaware of another critical nutrient that is missing from a plant-based diet? **Why is Man so arrogant that he thinks he can stray so far from what a cat is designed by nature to eat?**

Let's also ask ourselves the following question: How many cats become ill or die from these species-inappropriate diets yet the patient's diet is never even questioned as a possible cause of the illness or death? We cannot answer that question definitively but I have no doubt that the answer would be "many".

Do cats survive on these supplemented plant-based diets? Yes, many of them do.

Do cats thrive on these diets? No, they do not.

Please pay special attention to the words ***survive*** versus ***thrive*** as there is a very big difference between the two states of health.

Another important issue with regard to the protein contained in a dry food is that it has been cooked at very high temperatures for a long period of time. The extensive cooking required to remove most of the water from the food can decrease the biological value of the protein sources.

Harsh cooking also destroys other nutrients. Man then has to guess which nutrients – in what form and amounts – were destroyed by this cooking process and then try to add them back into the diet.

Given that Man will never be as 'smart' as nature – he will never know every detail of a cat's normal prey - it is obvious that there is a risk when arrogance and greed cause humans to stray so far from a cat's natural diet.

With regard to the overall protein *amounts* contained in a food, do not be confused by the listing of the protein percentages in dry food compared to canned food. At first glance, it might appear that the dry food has a higher amount of protein than the canned food—but this is *not* true on a dry matter basis which is the accurate way to compare the two foods. Most canned foods, when figured on a dry matter basis, have more protein than dry food. And remember, even if this was not the case, the percentage numbers do not tell the whole story. It is the protein's biological value that is critical.

We Are Feeding Cats Too Many Carbohydrates

In their natural setting, cats—whose unique biology makes them true carnivores--would not consume the high level of carbohydrates (grains) that are in the dry foods that we routinely feed them. You would never see a wild cat chasing down a herd of biscuits running across the plains of Africa or dehydrating her mouse and topping it off with corn meal gluten souffle.

In the wild, 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 percent of her diet consisting of calories from carbohydrates.** The average dry food contains 35-50 percent carbohydrate calories. Some of the cheaper dry foods contain even higher levels.

This is NOT the diet that Mother Nature intended for your cat to eat.

A high quality canned food, on the other hand, contains approximately 3-5 percent carbohydrate calories.

Please note that not all canned foods are suitably low in carbohydrates. For instance, most of the Hill's Science Diet (over-the-counter) and the Hill's Prescription diets are very high in carbohydrates and are not foods that I would choose to feed.

Cats have a physiological decrease in the ability to utilize carbohydrates due to the lack of specific enzymatic pathways that are present in other mammals, and the lack a salivary enzyme called amylase. **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 as I explain below.**

With this in mind, it is as illogical to feed a carnivore a steady diet of meat-flavored cereals as it would be to feed meat to a vegetarian like a horse or a cow, right? So why are we continuing to feed our carnivores like herbivores? Why are we feeding such a species-inappropriate diet? The answers are simple. **Grains are cheap. Dry food is convenient. Affordability and convenience sells.**

However, is a carbohydrate-laden, plant-based, water-depleted dry food the best diet for our cats? Absolutely not.

Obligate carnivores are designed to eat meat – *not* grains - and they need to consume water *with* their food as explained below.

Cats Need Plenty of Water *With* Their Food

This is a very important section because it emphasizes why even the low-carb, grain-free *dry* foods are not optimal food sources for your cat.

Please see the *Feline Urinary Tract Health* page at www.catinfo.org to see how sweet Opie suffered tremendously and came close to losing his life after becoming blocked and almost rupturing his bladder.

Keep in mind that the cheapest canned food is better than *any* dry food on the market.

Water is an extremely important nutrient that contributes to overall health in every living creature. Couple this with the fact that cats **do not have a very strong thirst drive when compared to other species** 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 the bulk of their diet.**

Cats are designed to obtain most of their water with their diet since their normal prey contains approximately 70 - 75 percent water. Dry foods only contain 7-10 percent water whereas canned foods contain approximately 78 percent water. Canned foods therefore more closely approximate the natural diet of the cat and are better suited to meet the cat's water needs.

I hear the reader saying "...but I see my cat drinking water frequently so he must be getting enough!"

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 (what's in their diet plus what they drink), **the cat on dry food consumes approximately half the amount of water compared with a cat eating canned food. This is a crucial point when one considers how common kidney and bladder problems are in the cat.**

Please keep in mind that when your cat starts eating a more appropriately hydrated diet of canned food, his urine output will increase significantly – often doubling – which is a very good thing for bladder health. Think of canned food as 'hosing out' your cat's bladder several times/day. Given this increase in urine output, **litter boxes need to be scooped more frequently or more boxes need to be added to the home.** Please see [The Litter Box From Your Cat's Point of View](#) webpage at catinfo.org for reasons why I strongly feel that clumping litter is the only sanitary choice of litter to use for cats. Non-clumping litters do not allow you to remove all of the urine and are not sanitary litters.

Common Feline Health Problems and Their Ties to Diet

There is a very strong and extremely logical connection between the way that we are currently feeding our obligate carnivores and many of the life-threatening diseases that afflict them. See catinfo.org for more details regarding each disease process briefly discussed below.

- **Diabetes:** Diabetes is a very 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-inappropriate level than that found in many commercial foods.

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 a significant factor in *causing* diabetes in some cats.

In addition to the issue of carbohydrates and how they affect the blood sugar level of most cats, dry food is very calorie dense, is very palatable, and is usually free-fed which often leads to **obesity.**

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

It is very important to understand the impact that a low carbohydrate diet has on the insulin needs of a diabetic cat.

If you have decided to start feeding your diabetic cat a low carbohydrate diet, please review the [Feline Diabetes](#) page at catinfo.org before you change the diet. Be sure to review the STOP sign section on that webpage.

- **Kidney Disease** (CKD - formerly called "CRF"): 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' such as Hill's Prescription k/d - which are commonly prescribed by veterinarians - contain only a small amount of moisture (~10% versus 78% for canned food) leaving your cat in a less than optimal state of water balance.

I must say that I find it truly amazing when I hear about the very large numbers of cats receiving subcutaneous fluids while being maintained on a diet of dry food. This is an extremely illogical and unhealthy practice and every attempt should be made to get these cats on a diet that contains an appropriate moisture level.

Please also note the first four ingredients of Hill's Prescription dry k/d while bearing in mind that your cat is a carnivore:

Brewers rice, corn gluten meal, pork fat (preserved with mixed tocopherols and citric acid), chicken by-product meal

This is a diet that would never find its way into a food bowl owned by any cat in my care. The first three ingredients contain no animal-based proteins making it an extremely low quality, inappropriate diet for any cat.

The purpose of this prescription diet is to restrict protein which, unfortunately, it certainly does. **However, please understand that there are no studies showing that restricting protein to this level will prevent further deterioration of kidney function.**

k/d restricts protein to the point that some cats - those that are not consuming enough of the diet to provide for their protein calorie needs - will catabolize (use for fuel) their own muscle mass which results in muscle wasting and weight loss. This internal breakdown of the cat's own muscle mass will cause an increase in creatinine which needs to be cleared by the kidneys. The rise in creatinine, and muscle wasting, can lead to an often-erroneous conclusion that the patient's CKD is worsening.

Of course, the same deterioration can occur in any cat that is not consuming enough protein, but the level of protein in this diet is not only at an **extremely low level**, it is in an **incomplete form for a carnivore**. Note that it is made up mainly of plant proteins – not meat proteins. There really are much healthier diets available for cats with kidney disease than dry k/d.

- **Cystitis (bladder inflammation), Bladder/Kidney Stones, Urethral Blockage:**

Please see the [Feline Urinary Tract Health](http://catinfo.org) webpage at catinfo.org for more detailed information on urinary tract issues, including the story and pictures of "Opie". The first paragraph on that webpage reads:

If I could have the reader take away just one word from this discussion, it would be "water". If your cat is on a properly hydrated diet of 100% canned food - and no dry food - you stand a very good chance of never needing to read this webpage.

Note that I said "water", not "crystals", or "urine pH", or "prescription diets" which are low quality diets used to manipulate urine pH. This is because if humans would just feed cats a properly hydrated, meat-based diet to begin with, urinary crystals and pH would, in almost all cases, become non-issues.

Please keep in mind that **a cat has a very low thirst drive and is designed to get water with their food.** It has been shown that a cat on canned food consumes **double** the amount of water when compared to a cat eating dry food when all sources of water (food and water bowl) are considered. People who feed dry food to their cats often say "but my cat drinks a lot of water" but, in reality, their cat consumes roughly half the amount of water that a cat on canned food consumes.

The urinary tract system of any living creature needs water flowing through it to maintain optimal health. For the cat, this means they should be eating canned food, not dry food. Think of canned food as flushing out your cat's bladder several times each day.

In addition to feeding a water-depleted diet and focusing too heavily on pH and urine crystals, another very serious mistake that Man makes with regard to urinary tract disease in the cat is the rampant **misuse/abuse of antibiotics**. Antibiotics are prescribed on a daily basis in many veterinary practices without considering the fact that **infections are not a common cause of urinary tract disease in cats**. This frequent abuse of antibiotics not only wreaks havoc on the cat's body, but also promotes bacterial resistance to the antibiotics.

The most common cases that receive needless antibiotics involve patients with **cystitis**. 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**.

Again, 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**. This is a very important concept to understand if we are ever going to stop abusing antibiotics for feline urinary tract issues.

Many people – including veterinarians - erroneously use the term “UTI” (urinary tract infection) to label what is usually sterile cystitis but, in most cases, the “I” should stand for “inflammation”, not “infection”. Cats with sterile cystitis are often given needless antibiotics when, in fact, they are crying out for pain medication, as discussed below. **Keep in mind that blood in the urine does not necessarily mean that an infection is present**. Blood is often present at a site of inflammation but is *not* specific for infection.

Important statistics: 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. The patients in this age group rarely have infections because they produce very concentrated urine (Urine Specific Gravity greater than 1.035) and bacteria do not grow well in concentrated urine.

In cystitis patients over 10 years of age, infections are more common (~20-30% versus ~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. The reason that an older cat is more prone to urinary tract infections is because kidney disease is more common in this age group and if the patient does have kidney insufficiency, they will have a more dilute urine which is not as hostile to bacterial growth.

Diabetes and hyperthyroidism are also more common in cats over 10 years of age and both disease render the patient more prone to urinary tract infections.

So how do we determine if the patient has an infection or not? And if they do have an infection, how do we know which is the best antibiotic to use?

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. The urine for a C & S needs to be obtained by way of cystocentesis which involves using a syringe and needle to obtain urine directly from the bladder. This is not a painful procedure for the cat and this method is the only way to obtain a sample for accurate information in order to properly treat with antibiotics. One problem, however, is that a sample may be difficult to obtain without waiting a few hours since cats with cystitis urinate frequently and often do not have enough urine in their bladder to get a good sample.

To get around this problem, some veterinarians will give the patient a dose of subcutaneous (just under the skin) fluids. The cat is then put into a cage without a litter box. Within a couple of hours, the bladder is usually full enough to obtain a urine sample via cystocentesis. This usually only takes 2-3 hours – sometimes even less time.

To repeat: ~98% of cats under the age of 10 years, and 70%-80% of cats over 10 years of age, that present with clinical signs of cystitis, do *not* have an infection.

A culture and sensitivity (C & S) lab test should be run on all (or at least those with dilute urine or diabetes) patients with cystitis to prove that an infection does – or does not – exist. **We have to stop treating all cases of cystitis with antibiotics without supporting evidence of an infection!**

As stated above, we know that **stress** plays a critical role in causing inflammation of the feline bladder. Therefore, an understanding of the vicious cycle involving **pain** and **stress** is crucial to the management of this disease.

Cystitis is very painful. **Pain => stress** and **stress => cystitis**. Consequently, it is very important to address pain management in cystitis patients. Buprinex is a good choice for a pain medication. This is superior to Torbugesic which has been used for pain management in the cat in the past. (Buprinex is a prescription medication that you must get from your veterinarian.) **Unfortunately, many veterinarians overlook pain medication as a very important part of the treatment of this common feline problem.**

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, in addition to pain medication being an

important part of the treatment, it is also vital for the cleanliness of the home to do whatever we can to avoid a litter box aversion. And, of course, it is only humane to treat any animal's pain.

Cystitis will often recur in these patients but on a good note, many cats will have their clinical signs quickly (within a few of days) resolve, especially if their pain is immediately addressed with Buprinex. Another subset of cats will spontaneously go into remission without any treatment at all.

With regard to the overuse of antibiotics in these patients, it has often been said, jokingly, that a cat with cystitis will often stop exhibiting clinical signs within seven days *with* antibiotics and in one week *without* antibiotics.

Unfortunately, when people don't understand that many of these patients experience spontaneous remission on their own with no treatment, antibiotics get the credit when they had nothing to do with the patient's improvement. When this happens, the abuse of antibiotics continues.

In summary, **stress/pain management** and **water content of the diet** are the most important issues when considering the **prevention** and **treatment** of cystitis. That said, even cats that are fed a 100 percent canned food diet may experience bouts of cystitis but far less commonly than dry food-fed cats. This is a very frustrating disease to deal with and one that the veterinary community does not have all the answers for. The water content of the diet is easy to control – feed canned food with added water as noted below. The stress issue is another matter and is not always easy to address since cats can be very sensitive and are often 'silent' in their stress.

Leaving cystitis and moving on to **crystals**: It is very important to note that crystals are not the same thing as stones. **Crystals are often a normal finding in a cat's urine** and it is not necessarily appropriate to put the cat on a "special urinary tract" formula when these are found in the urine.

I see too much clinical significance placed on the identification of crystals in the urine, in general, but the situation is made worse when it is assumed that the crystals are 'real' without regard to how the urine sample was handled. It is very important to understand that crystals **will often form once outside of the body within a very short (30-60 minutes) period of time**. If the veterinarian does not examine the urine right away and either sends it to an outside laboratory or uses a free-catch sample that the owner brought from home, an erroneous diagnosis of crystals may be made. This is called a "false positive" report and results in unnecessary worry on the part of the owner and often leads to the cat being placed on an inappropriate, low quality diet.

What role does diet play with respect to crystals?

When a cat is on a diet of water-depleted dry food, they produce a more highly **concentrated** urine (higher urine specific gravity - USG) and they produce a lower **volume** of urine (often half of what a cat on canned food produces) which means that a **higher concentration of crystals** will be present in the urine. This increases the chance of these crystals forming life-threatening stones. It is also thought that the highly concentrated urine may be very irritating to the bladder wall in some cats, predisposing them to painful cystitis.

Adding 1-2 TBS of water (plain or flavored – such as tuna water, clam juice, chicken or beef broth) 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.

If you are still worrying about crystals, consider this analogy:

If leaves keep falling on your driveway (which is a normal situation) and you don't regularly hose down or sweep your driveway, those leaves will build up and cause a problem. If you picture crystals as the leaves in this analogy, it is easy to see how canned food does a much better job of 'hosing down/flushing' your cat's bladder than dry food does.

To repeat, crystals are *not* an abnormal finding in cat urine. However, they can become a problem if Man continues to insist on feeding the cat a water-depleted diet. Stones, or a large amount of crystals, can cause a fatal rupture of the bladder by blocking the outflow of urine. (See Opie's story at catinfo.org - *Feline Urinary Tract Health*.)

Any cat that is repeatedly entering the litter box but not voiding any urine is in need of IMMEDIATE medical attention! This is one reason why it is so important to use a clumping litter. Clumping litter allows

you to see just how much, if any, urine is being voided. Is the urine ball the size of a raisin? A grape? A golf ball? A plum? A tennis ball? Non-clumping litters are not sanitary since it is impossible to remove all of the urine several times/day (see [The Litter Box](#) at [catinfo.org](#)) and they do not allow you to quantify the amount of urine being passed.

Urine pH is often considered when discussing urinary tract crystals but we really need to stop focusing on pH. **Again, a proper amount of water in the diet is the important issue here - not urine pH.**

The one exception to this would involve the **temporary** (1-2 months) use of a prescription acidifying diet such as Hill's canned (not dry) s/d - with added water - for struvite stones or a large amount of struvite crystals - especially in a male cat since their long, narrow urethral puts them at greater risk for a life-threatening blockage. **This diet is not to be used for long-term feeding!**

It also must be understood that if the cat has calcium oxylate stones or crystals, this diet will make matters worse for the patient since calcium oxylate forms in acidic environments. The patient should be re-checked with xrays or ultrasound within 3-4 weeks after starting the diet in order to monitor progress, or lack of progress, in dissolution of the stones/crystals.

Other than as stated above, I do not use the prescription diets or any over-the-counter 'Urinary Tract Health' diets. Many of these often-prescribed feline lower urinary tract diets are formulated to make the urine acidic but it is thought that these low magnesium, acidifying diets may actually exacerbate painful cystitis. Also, these acidifying diets often end up promoting calcium oxylate stone formation and can also lead to hypokalemia (low potassium in the blood) which can cause or exacerbate kidney disease.

It is also important to note - for those people still stuck on worrying about the urine pH - that there are many factors which determine the pH of urine and only one of them is diet.

With regard to dry food and urinary tract health, aside from the lack of water in this type of diet, there is also a correlation between the consumption of a high carbohydrate diet (most dry foods are very high in carbohydrates) and the formation of struvite crystals because carbohydrate-based diets promote an alkaline urine.

Veterinarians often prescribe Hill's Prescription dry c/d and x/d for urinary tract problems but again, these diets are only ten percent water and contain a high level of species-inappropriate ingredients and questionable preservatives. They are also very high in carbohydrates with dry c/d containing 42 percent of its weight as carbohydrates. Please note the first few ingredients in dry c/d while remembering that your cat is a carnivore. This is certainly not a diet that I would recommend for any cat.

Brewers rice, chicken by-product meal, corn gluten meal, pork fat (preserved with mixed tocopherols and citric acid), chicken liver flavor, taurine, preserved with BHT and BHA

- **Inflammatory Bowel Disease (IBD):** IBD can cause vomiting, diarrhea, and/or constipation in the cat. IBD can also present with weight loss as the only clinical sign. There are many unanswered questions with respect to this disease process, but it seems logical to start to "treat" a gastrointestinal problem in the cat with a species-appropriate diet.

Too often these cats are initially treated with a high level of steroids and a prescription grain-laden, dry food diet. I feel very strongly that this common therapeutic regimen needs to be abandoned. There are an impressive number of anecdotal reports of cats that were terribly ill with IBD exhibiting dramatic improvement when *all* dry food was removed from their diet. (Steroids – long-term or temporary - are necessary in some cases but we need to focus more heavily on feeding these patients an appropriate diet.)

Taking it even one step further, **there are many reports of cats with IBD that improved tremendously on a *balanced, grainless, raw-meat or lightly cooked meat diet***. See the [Making Cat Food](#) page at [catinfo.org](#) for a balanced recipe that has helped many IBD cats.

- **Obesity:** Obesity is an extremely common and very serious health problem in cats. For instance, overweight cats are four times more likely to develop diabetes than cats that are at an optimal weight. Obese cats are more prone to orthopedic problems and often cannot clean themselves properly. Obligate carnivores are designed to meet their energy needs with a high protein, moderate fat diet with few carbohydrates. Carbohydrates are minimally used for energy 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. The choice is then to raise either the protein or carbohydrate content, or both.

Since protein (meat) is more expensive than carbohydrates (grains), pet food manufacturers raise the carbohydrate levels in these foods making them very species-inappropriate and unhealthy.

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). See the Merrick line of foods for examples of this profile.

Many cats on the commercial “light” or “less active” diets either do not lose weight or do lose weight but also lose muscle mass along with the loss of fat. This is not our goal. The goal is to lose fat while maintaining muscle mass.

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.

Many caretakers feed very small amounts of these ‘light’ diets hoping that their cat will lose weight. However, feeding a *small amount* of a diet that is inappropriate for the species is *not* the answer! The caretaker often ends up with either a crabby, overweight cat or a thinner cat that may have lost too much muscle mass.

See Molly’s and Bennie’s story of weight loss at [Feline Obesity](http://catinfo.org) - catinfo.org - to read about how these sweet cats went from inactive obese cats that could barely walk or clean themselves to healthier, happier felines.

Molly’s veterinarian had prescribed Hill’s Prescription dry r/d but this is a poor quality, high carbohydrate (33%) diet. There are much healthier – and less expensive - ways to address feline obesity. However, if you are contemplating the use of the high protein/low carb, grain-free *dry* foods, please understand that these diets are VERY calorie-dense and often result in weight *gain*, in addition to being detrimental to the urinary tract system because of their water-depletion.

- **Hepatic Lipidosis (Fatty Liver Disease):** This is the most common metabolic liver disease of cats. Cats that go longer than 48 hours without eating, for any reason, are in danger of developing this serious, and often fatal, disease. Even though thin cats can end up with hepatic lipidosis, overweight cats are much more prone to experiencing this disease. Feeding a high-protein, low-carbohydrate canned diet helps keep cats at an optimal, healthy body weight and, in turn, makes them less likely to end up with fatty liver disease.
- **Dental Disease:** Long-standing claims that cats have less dental disease when they are fed dry food versus canned food are grossly overrated, inaccurate, and are not supported by recent studies. This frequently stated (among veterinarians and lay people) myth continues to harm cats by perpetuating the idea that their food bowls need to be filled up with an unhealthy diet in order to keep their teeth clean. The idea that dry food promotes dental health makes about 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 the majority 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. There remain many unanswered questions concerning the fact that cats often suffer from poor dental health but one very obvious answer lies in the fact **that Man feeds the cat a diet that does not even come close to what they would eat in their natural state.**

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.

Neither dry kibble nor canned food comes close to mimicking a cat’s normal diet of mice, birds, rabbits, etc. Given what a cat does eat in nature, it makes much more sense to be feeding part of the diet in the form of large chunks of meat (as large as you can get your cat to chew on) or gizzards (tough and fibrous) which a cat’s teeth are designed to chew. Raw meat is ‘tougher’ to chew than cooked meat so I prefer to use raw – or parboiled - meat to promote dental health. (See *Making Cat Food - Dental Health* at catinfo.org.)

Notice the phrase “part of the diet” in the above sentence. It is very important to understand that **plain meat (ie - without bones or another source of calcium) is very unbalanced** since there is minimal calcium in meat. Keep in mind that when a cat eats his normal prey, he is consuming the bones along with the meat.

When fed as a supplement to most commercial canned foods, it is safe to feed ~15% of the daily calories in the form of plain meat. For example, if a cat is eating 6 ounces of canned food per day, you could feed him 5 ounces of canned food plus 1 ounce of chunked muscle meat per day.

When people ask me “how often should I feed chunks of meat to my cat?”, I reply “how often do you brush your own teeth?”

And speaking of **brushing teeth**, this is, by far, 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 very painful mouths but show no outward signs of this pain. 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 - along with developing a strong aversion to tooth brushes. If this aversion occurs, you may never get him to accept tooth brushing once you have addressed 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 since neither food type promotes healthy teeth 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 if possible, and to **stop fooling ourselves into thinking that dry food promotes dental health in our cats.**

- **Feline Asthma/Allergic Airway Disease:** Many cats have had their respiratory symptoms (coughing/difficulty breathing) subside considerably, or disappear completely, once they were placed on a grain-free canned food diet, or a meat-based home-prepared diet. Some of these struggling cats may have been simply reacting to the grain proteins found in high levels in dry food or they may have been reacting to storage mites or cockroach antigens that are present in dry foods.

Sadly, many cats exhibiting debilitating lung disease are simply put on an immunosuppressive dose of steroids - **while still being fed an inappropriate diet.** While steroids are necessary in many cases of airway disease, they are not addressing the root of the problem which can, in many cases, be an allergy to proteins in the form of species-inappropriate grains, and insect antigens. Steroids can cause diabetes in cats and also render them vulnerable to infections from viruses, bacteria, and fungal agents so it is very important to make sure you have ruled out diet as a cause of the cat's respiratory symptoms.

The Safety of Dry Food

Dry food is far from a clean, safe, and pathogen-free source of food for your cat. Please see the [Making Cat Food](#) page at [catinfo.org](#) which details just a few of the many pet food recalls that have been initiated due to contamination of commercial pet food with deadly chemicals, bacteria (salmonella, etc.), fungal mycotoxins, and storage mites. The issue of rancid fats in dry food is also discussed on that webpage.

Transitioning Dry Food Addicts to Canned Food

Note: There is a separate PDF file for the [Tips for Transitioning](#) which can be found at [catinfo.org](#). It is 7 pages long.

Keep in mind that the best time to implement a diet change is when the cat is *healthy*. Trying to get an ill cat to embrace a new type of food can be problematic and a cat that is not feeling well may even develop a food aversion if they associate the new food with their discomfort.

All cats will eat canned food eventually if the human is patient enough and tries enough tricks.

Home-Prepared Diets

If you are considering making your own cat food, please be aware that many people go down this path without doing their homework and end up feeding their cats **dangerously unbalanced diets.**

Please see [Making Cat Food](#) at [catinfo.org](#) if you would like more information about making cat food. For the past 7.5 years, I have been feeding my cats only food that I prepare for them myself and I could not be happier with their health.

People are often overwhelmed or intimidated by the idea of making their cat's food but, in reality, it's quite simple - **as long as you follow a balanced recipe.** I make cat food once every 1-2 months and freeze it. Making your own cat food doesn't mean slaving in the kitchen every day--trust me, if it did, I wouldn't be doing it.

One common mistake people make when feeding a home-prepared diet is thinking that a cat can live on meat alone - without bones as a source of calcium, organ meat as a source of important nutrients, or added taurine, etc. While meat *must* be the primary component of a feline diet, there is not enough calcium in meat (without the bones) to ensure that a safe calcium-to-phosphorus ratio is achieved. **Always remember that calcium is not an optional “supplement,” but is a very critical component of the diet.** Meat is also deficient in other vital nutrients so, again, make sure that you follow a balanced recipe from a reputable source.

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. This paper has outlined what constitutes optimal nutrition for an obligate carnivore in a home environment.

The most common complaint that I hear from people is that their cat will NOT eat canned food and will ONLY eat dry food. My cats fell into this category which was not surprising since they had been on a 100 percent dry food diet their entire lives and ranged in age from 2 -10 years at the time of the transition to a healthier diet. It took me several months to convince them that they are **carnivores and need meat** – and not in a dry, overly processed form that also includes far too many carbohydrates and too little water. It was a little rough, at times, since two of my cats get very crabby with their housemates when they are hungry. These boys were occasionally taken into a separate room during the transition period and fed some dry food because I do not like unrest in my home.

Surprisingly, one of my most stubborn dry food addicts is now happily eating a home-prepared raw or parboiled meat/bones/organs diet that he actually likes better than the canned food. To be very honest, it does my heart good to see my little carnivores gnawing on meat – eating a diet that was meant for their species.

I no longer feed any dry food and can't imagine ever feeding my cats this type of diet again. Cats do not need, or benefit from, any dry food in their diet. They also do not need access to food 24 hours a day.

Many people who are at work all day worry that their cat will suffer without access to food continuously. However, I routinely leave canned food out for up to 12 hours at a time for my foster cats and kittens. Keep in mind that a cat's gastrointestinal tract is much different from ours.

If you are worried about leaving canned food out, you can always leave part of the food out at a normal ('mouse body') temperature and part of it **frozen**. The frozen portion will thaw within a few hours and will add some time to the freshness of the food. This is also a great trick if you need to be gone for 24 hours or if you can't find a pet sitter that can come to your home every 12 hours when you go on vacation. There is never any reason to revert back to sitting out a bowl of dry food since cats should be checked on – including having their litter box (es) cleaned – at least once every 24 hours anyway. Normally litter boxes should be cleaned at least twice-daily so if they are only going to be cleaned once-daily, you should consider adding another box or two....keeping mind that once there are more than 3-4 'items' in a box, it is dirty and needs to be scooped in order to be fair to your cat(s).

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.

Lisa A. Pierson, DVM
DrPierson@catinfo.org
Updated: August, 2010

Information contained in this handout is for general informational purposes only and is provided without warranty or guarantee of any kind. The information contained here is not intended to replace professional advice from your own veterinarian and nothing in this handout is intended as a medical diagnosis or treatment. Any questions about your animal's health should be directed to your veterinarian.