

## **Feline Nutrition: Getting Nutrition Into a Cat**

### **Learning Objectives**

1. Provide clinicians with a practical list of non-pharmaceutical interventions for an anorectic cat.
2. Highlight the strengths and weaknesses of pharmaceutical options for feline anorexia.
3. Provide clinicians with step-by-step instruction on the placement of an esophageal feeding tube.

### **Introduction**

Our understanding of feline nutrition has advanced significantly from the day when we simply considered them small dogs, and the number of options we now have for dietary intervention in this species has expanded exponentially. But neither the knowledge of feline metabolism nor the number of available diets helps us, or the cat, one bit, if we can't get the stuff into them. When a Labrador retriever refuses to eat we know the prognosis is grave: when a cat refuses to eat it may well be that they have decided that the presentation of their latest meal was not up to standards. Unlike Labrador retrievers, cats are one-trial learners, so make the mistake of trying sneak a medication into the one particular flavor of food the cat will tolerate, and that may well be the last time you get anything into that cat's mouth. Try to switch diets on a Labrador and you might get a brief pause as the dog considers the phrase "fool me once, please!". Try to switch diets on a cat, for its own good mind you, and suffer an expression of disdain and an attitude of incredulous indignation. So of course, what is perhaps the single most common clinical expression of almost anything wrong with a cat? A decreased-to-absent appetite. And what are the consequences of anorexia in a cat compared to a Labrador? Well cats have their own specific condition for just that – hepatic lipidosis. This presentation should be considered a "group effort" as collectively the veterinary profession aspires to be more clever than a single cat and we explore a plethora of possible strategies for getting nutrition into a cat. This presentation addresses the anorectic cat, starting with the cause and consequences. Therapeutic targets are highlighted, from attitude to environment to the chemistry and physiology behind the cat's refusal to eat – and how the clinician might best intervene.

### **Terminology and Differentials**

Hyporexia (or Dysrexia) is the term for a reduced appetite and Anorexia is complete inappetence. Large category differentials for Anorexia are: Primary anorexia, Secondary Anorexia, and Pseudo-Anorexia. Primary anorexia is most often associated with brain disease, trauma, or tumor, including "anosmia" or the inability to perceive odor – a particularly important sensation for cats. Pseudo-anorexia is any condition where the cat actually wants to eat but is extremely reluctant to do so because of other pressing problems. Examples of pseudo-anorexia would include dental disease, musculoskeletal disorders, pain (of the some component of the oral cavity and GI tract, or an unrelated but uncomfortable condition), stress, anxiety, depression, even environmental cues. Secondary anorexia is everything else, and the category that is most commonly the reason for presentation of a cat that's not eating.

## Consequences

Anorexia leads to malnutrition, and malnutrition has significant consequences for cats. The cat's unique metabolic make-up is not particularly well suited for adapting to different nutritional planes, their metabolic rate and preferential metabolic pathways do not alter their activity level to a great extent in response to changes in nutrient content. When their diet or lack of dietary intake fails to provide their preferred nutrients they may turn to their endogenous supply (muscle protein leading to cachexia) or over-produce harmful metabolic by-products (ketoacidosis). A poor nutritional plane leads to immunosuppression, proteolysis, hepatic lipidosis, and an increase in mortality. Importantly, Reynolds et al. (2010) showed that for cat owners the quality of life is more important than longevity, and appetite ranked as one of the key components in a cat owner's perception of their cat's quality of life. Cats are also particularly prone to stress, whether obvious to us or only perceived by the cat, and Stella et al. (2011) demonstrated that one of the consequences of stress in cats is anorexia.

## Veterinary Clinics and Hospitalized Cats

The advent of Feline Friendly Practice standards ([www.catvets.com](http://www.catvets.com)) from the American Association of Feline Practitioners goes a long way towards helping clinicians design environments and interactions that can reduce stress and decrease the incidence of hospital acquired anorexia in our feline patients. Unfortunately there are still too many scenarios where cats who are already feeling ill are stuffed into a carrier and exposed to a room full of predators just before being introduced to the healing hands of the veterinary staff, potentially for restraint, target practice, and indignity before being transferred to a metal box with none of the comforts of home. But an active appreciation and the motivation to change can go a long way towards relatively simple (a hiding box, an elevated perch, the appropriate temperature, the line-of-sight) or complex (feline-only reception area, cat-only exam rooms, specially trained and qualified "crazy cat" nurses) measures to reduce the stress of your feline patients and the anxiety of their owners. While hospitalized it should be routine for cats to be weighed daily and assessed in terms of body condition score, muscle score, amount of food and water consumed, evidence of urination and defecation, including fecal characteristics. Consideration of who is feeding the cat, what and in what, when and where, texture (it is often mistakenly assumed that every cat would prefer wet food to dry... not so) and social setting (some will only eat when witnessed, others only when alone). Remember that cats are "neophobic", they are very suspicious of new things and most everything in a veterinary clinic is new to a cat. Ironically, the veterinary hospital is probably the worst place (and time) to attempt to introduce a cat to a new "prescription diet", and as mentioned, hiding medication in what a cat will eat is, unfortunately, often a quick way to add that to the list of what a cat will not eat. Consider a "sacrificial" diet first.

Guideline for How Much to Feed a Cat:

Resting Energy Requirement (RER) =  $30 \times \text{weight (kg)} + 70 \text{ Kcal}$  for cats < 5 kg  
=  $70 \times \text{weight (kg)}^{0.75} \text{ Kcal}$  for cats > 5 kg

5 kg cat: 220 kcal/day, with > 5 gm protein/kg/day

KEY = Monitoring!

## Non-Pharmaceutical Intervention in Hyporexic Cats

Dr. Google, the Popular Press, Cat Fancy magazine, YouTube, and the Crazy Cat Lady next door, the number of reliable sources for ideas on how to convince a cat to eat are almost boundless! Much of it common sense, some of it is cat sense, some of it is Oscar Myer Bologna. At first do no harm, but as long as you observe that Golden Rule, Kitty-bar-the-door because it is open to most whatever your imagination can come up with. From obvious (palatability, smell, temperature, texture, freshness, presentation) to open-mindedness (acupuncture, slippery elm, B vitamin complex) to absurd (wafting wonderful odors under their noses while blowing CatNip bubbles into their faces...), all are worthy of consideration.

## Pharmacology

Several recent pharmaceutical advances are of tremendous benefit to the cat with some form of gastrointestinal disease as a reason for anorexia, and the clinician attempting to care for that patient. Metoclopramide still may have a place as a pro-motility agent in the cat, but it has largely been replaced by cisapride (5mg per cat, two to three times daily) for that function. The pharmacology of the cat's emetic center is simply not amenable to metoclopramide as an effective feline anti-emetic. Fortunately, ondansetron (0.5 mg/kg IV or PO once daily) and maropitant (1mg/kg daily, subcutaneously or orally – 1/4<sup>th</sup> of a 16mg tablet) appear to be very effective anti-emetics in the cat. So if needed, we can stop the cat with acute gastritis from vomiting. What about getting them to eat? Cyproheptadine (2-4mg per cat, once or twice daily) has long been used as an appetite stimulant in cats, with variable success. More recently, mirtazapine (1/8<sup>th</sup> of a 15mg tablet once daily, reduce the dose to every other day in cats with chronic kidney disease) has been shown to be an effective appetite stimulant in many cats, and may have some anti-emetic properties as well. Contrary to the original dosing information (every 3 days), research by Dr. Quimby at Colorado State University has shown that the pharmacokinetics of mirtazapine in cats would require daily administration of the drug for full effect. It appears safe to mix and match the various anti-emetics and appetite stimulants, and the most effective combination will likely differ for different patients.

Finally, if a feline patient at CSU is approaching 48 hours without having been convinced to take on nutrition voluntarily (or with the help of pharmaceutical intervention), we will move relatively quickly towards "assisted feeding" through either a nasoesophageal feeding tube (liquid diet such as CliniCare at 1 kcal/ml, or the human product Ensure, also 1 kcal/ml), or quite frequently, an esophageal feeding tube (E-tube) with a blenderized diet, particularly if we are trying to get the cat out of the hospital.

E-tube placement: (a number of excellent demonstrations available as YouTube videos). Consider the commercially available product (see [www.milainternational.com](http://www.milainternational.com); Esophagostomy Feeding) for user-friendly ease of insertion.

- 20-24 French Argyle Catheter
- Surgical scrub & alcohol; sterile gloves; 3cc syringe; 2-0 or 3-0 Nylon suture
- Clippers & blades, Sterile instrument pack (towels, drape, clamps, scalpel #10 blade, 4x4s)
- Curved blunt-tipped forceps
- General anesthesia, right lateral recumbency for left-sided placement
- Aseptic prep of lateral mid-cervical area, extend neck, place mouth speculum
- Premeasure feeding tube from mid-cervical to 7<sup>th</sup>-8<sup>th</sup> intercostal space (place mark on tube)
- Cut end of feeding tube at an angle to enlarge diameter of delivery
- Large curved forceps through oral cavity, into esophagus, push outward to id entry point
- 1-2 cm incision over Forceps bulge in neck, avoid vessels
- Blunt dissection of subQ, esophagus & esophageal mucosa to visualize forceps
- Forceps grasp end of E tube and pull that portion out of the mouth to pre-marked length
- Reinsert tip of tube through mouth, into esophagus, and feed distally

- Outer portion of E-tube will “flip”, showing that inner portion is running in aboral direction
- Chinese finger trap and bandage

## **Summary**

1. Anorexia leads to malnutrition relatively quickly in the feline and should be addressed early.
2. Abundant numbers of unproven strategies exist for encouraging cats to eat, use common sense.
3. Pharmacological intervention should be temporary while underlying conditions are addressed
4. The Esophageal Feeding Tube is an excellent way to empower an owner to help their cat.

## **Suggested Reading**

Fink L, Jennings M, Reiter AM. Esophagostomy feeding tube placement in the dog and cat. *J Vet Dent* 31:133-8, 2014.

Kahn SA. Placement of canine and feline esophagostomy feeding tubes. *Lab Anim (NY)* 36:25-6, 2007.

Agnew W, Korman R. Pharmacological appetite stimulation: rational choices in the inappetent cat. *J Feline Med Surg* 16:749-56, 2014.

Ferguson LE, McLean MK, Bates JA, et al. Mirtazapine toxicity in cats: retrospective study of 84 cases (2006-2011). *J Feline Med Surg* 18:868-874, 2016.

Chan DL. The inappetent hospitalized cat: clinical approach to maximizing nutritional support. *J Feline Med Surg* 11:925-33, 2009.