

FELINE FEEDING PROGRAMS

Addressing behavioral needs to improve feline health and wellbeing

Tammy Sadek (chair), Beth Hamper, Debra Horwitz, Ilona Rodan, Elizabeth Rowe and Eliza Sundahl

Purpose

To advise veterinarians, veterinary students, veterinary technicians and cat owners about the ways cats naturally feed, and to recommend how to feed the pet cat to optimally satisfy its behavioral needs using feeding programs that include play and predation, reduce stress in single and multi-cat environments, and meet nutritional requirements for overall health. Feeding strategies need to be tailored to the individual cat and household.



This AAFP Consensus Statement provides strategies to allow normal feline feeding behaviors, thus alleviating or preventing stress-related and/or overeating issues.

Introduction

The specific dietary needs of the cat have been established and foods have been developed that provide good nutrition for all life stages as well as for many medical conditions. Less attention has been given to addressing how meeting the cat's natural feeding behaviors and environmental needs can positively impact its physical and emotional wellbeing. We have a great deal of information about what to feed cats, but relatively little discussion of and emphasis on managing the feeding process to improve this species' quality of life and ability to cope with the lifestyle we have chosen for it.¹

This American Association of Feline Practitioners (AAFP) Consensus Statement, 'Feline feeding programs: addressing behavioral needs to improve feline health and wellbeing', explores the medical, social and emotional problems that can result from the manner in which most cats are currently fed. It provides strategies to allow normal feline feeding behaviors to occur in the home environment,^{2,3} thus alleviating or preventing stress-related and/or overeating issues.^{3–6} These strategies include offering frequent small meals using appropriate puzzle feeders, forage feeding, and multiple food and water stations.

Normal feline feeding behavior

All felids are meat eaters, or strict carnivores, and many domestic cats have a strong hunting instinct.^{7,8} Cats are solitary predators that consume small prey, and they prefer to eat often and alone. Their prey is of low caloric density, necessitating several kills per day (for which they expend large amounts of energy) to meet their basic nutritional requirements.^{7,8}

Impact of cat lifestyle

The indoor cat

Many pet cats worldwide live indoors, but a solely indoor lifestyle can prevent normal behaviors such as hunting and foraging, which negatively impacts a cat's welfare.^{4,9,10} In fact, it has been documented that behavioral problems are more common in cats without access to the outdoors.⁴

Most indoor cats need to rely on humans for food provision. They are often fed with other cats in one location and given relatively large volumes of food once or twice daily or ad libitum, without consideration of each cat's individual energy requirements.



The outdoor cat

Cats with outdoor access are usually fed similarly to indoor cats, eating readily available, highly palatable food, often rapidly, and have little need to forage and hunt. This leaves a void in the 'time budget' of cats with outdoor access as well as indoor-only cats. Cats can naturally spend half of every 24 h looking for and obtaining food.²

The multi-cat household

Cats engage in and maintain social relationships with other cats and will even live in large colonies (typically of related cats) when resources are sufficient.³ However, within the group some cats may choose to associate with certain members and actively avoid others.³ Related cats are often, but not always, bonded.

In multi-cat households, cats usually do not share their provided space equally.¹¹ In these homes, cats may be restricted or self-restrict to certain areas or rooms because of their social relationships, personalities and genetics. Some cats go into all rooms and others have rather small spaces in which they feel comfortable and safe.

As mentioned, cats naturally prefer to eat small, frequent meals alone, thus competition for food can cause conflict and pre-feeding aggression.^{6,12,13} An important point to note is that cats may not show overt signs of tension or stress, which therefore often go unrecognized by owners.

Problems associated with current feeding methods

Obesity-related problems

- ❖ The typical household practice of feeding one or two large meals at a single feeding station does not address the domestic cat's need for both eating alone and eating multiple small meals a day.^{6,14} This approach to feeding can lead to inactivity and even distress, often resulting in overconsumption and obesity.¹⁵
- ❖ Modern pet food is highly palatable and easy to eat rapidly, due to its small chunks and kibble formulation. These factors can contribute to overeating and weight gain.
- ❖ If a cat is bored and has little to do, eating can in itself become an activity, even in cats with outdoor access,⁴ leading to excessive calorie intake and obesity.¹⁵ Overweight cats have more difficulty performing physical activities such as jumping, climbing, hunting and playing, exacerbating the obesity problem.
- ❖ An indoor lifestyle in general has been demonstrated to increase the risk of obesity and associated diseases.^{16,17}

Cats naturally prefer to eat small, frequent meals alone, thus competition for food can cause conflict and pre-feeding aggression.



Stress-related problems

- ❖ Unsuccessful stress-related coping behaviors, especially in multi-cat households, such as lengthy intervals between litter box uses, may result in or aggravate illnesses such as cystitis.^{1,5,18,19}
- ❖ In an attempt to avoid a stressful encounter with another pet or even a household member such as an active toddler, a cat may develop the habit of gorging, with subsequent vomiting,^{13,20} in order to quickly return to a safe place.
- ❖ Other cats may have inadequate nutritional intake due to lack of access to food.^{1,5}

Solutions: how to develop appropriate feeding programs

The goal of a feeding program should be to mimic the cat's natural feeding behavior. Simulating normal feeding behavior in cats diminishes begging for food, feline frustration and inter-cat conflict. It also helps reduce relinquishment and enhances the bond between cats and their owners.¹⁴

Consider the following recommendations when developing the cat's program.

Puzzle feeders and foraging

Puzzle feeders (also called food puzzles) are objects that hold food and must be manipulated by the cat to release the food. Using puzzle feeders and hiding kibbles around the home increases activity, provides mental and physical stimulation,^{10,14} and improves weight management without contributing to patient and owner distress.^{1,21} A large range of puzzle feeders are available commercially (Figure 1),

Treats

Use of treats to train cats (eg, to carriers and for other procedures) reduces distress and increases mental stimulation and interest. Treats can likewise be used to train cats to use puzzle feeders. Small tidbits are best because they are easily consumed without adding too many additional calories. Treats should never amount to more than 10% of the total diet, and treat calories must be included when calculating daily food allowances.²¹

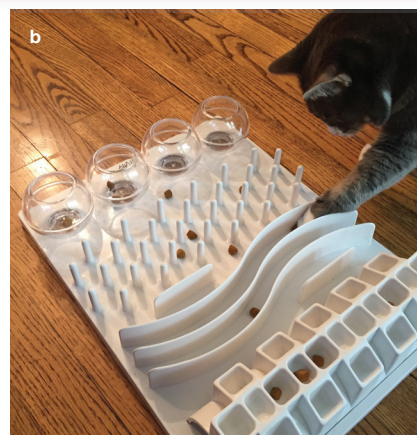


Figure 1 Two commercial puzzle feeders. These simple (a) and more complex (b) food puzzles are teaching kibble manipulation and retrieval using the paws, mouth and tongue. Courtesy of (a) Ilona Rodan and (b) Heather O'Steen

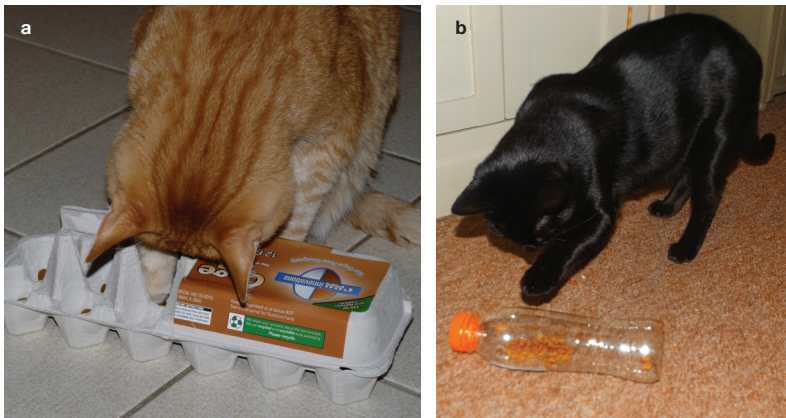


Figure 2 Two homemade puzzle feeders. (a) Like the feeders in Figure 1, this simple food puzzle also teaches food manipulation. (b) This dry food puzzle feeder encourages play and predation. Courtesy of (a) Ilona Rodan and (b) Elizabeth Rowe

or they can be made at home easily and inexpensively (Figure 2). Puzzle feeders vary in their complexity, can be stationary or rolling, and can be designed for dry or wet foods. Some types require more effort than others on the part of the cat to obtain food, either by manipulation of the feeder or by the use of paws or tongue to reach the food. Usually simple, easily manipulated puzzle feeders should be introduced first. More information on the different types of puzzle feeders, and how to introduce them into the household feeding program, is available at www.foodpuzzlesforcats.com.

Placing food portions in different or new locations, including making use of elevated space when the cat's physical status allows, can also enable cats to forage and engage their senses in searching for food.

Feeding plans should include:

- ❖ Frequent small meals
- ❖ Use of elevated space when physical health allows
- ❖ Separate water stations
- ❖ Recognition of multi-cat household social dynamics when locating resources and use of visually separated food and water stations
- ❖ Regular weight monitoring to ensure adequate food consumption

Client education

Consider these factors when developing a feeding plan:

- ❖ **Establish and communicate the motivation for the feeding routine change:**
 - Welfare, enrichment, weight loss, behavioral or therapeutic; remember the cat evolved as a solitary hunter/eater of multiple small meals
- ❖ **Understand the environment and social organization of the cat grouping:**
 - Cats may not share space equally nor affiliate with other cats, and forced interactions during feeding can be highly stressful
- ❖ **Distribute the resources based on individual cat access:**
 - Put food and water stations where individual cats spend the majority of their time, but not too close to litter boxes
 - Use newer technology such as microchip-based individual feeding bowl systems
- ❖ **Emphasize gradual acclimation strategies to puzzle feeders and foraging:**
 - Owners must be patient and willing to slowly teach cats to forage and use puzzle feeders
 - Cats differ in foraging strategies and abilities
 - Offer several types of puzzle feeders (see www.foodpuzzlesforcats.com)

Nutritional reminder

Most house cats are neutered and minimally active. Therefore, use 40–66 kcal/kg body weight/day as a starting point for determining calorie intake.²² Most calorie recommendations are only estimates. The true caloric requirement is the amount needed to maintain a cat in optimal body condition (2.5–3/5 or 4–5/9 on a body condition scoring [BCS] scale). Therefore, veterinarians and clients need to monitor body condition frequently and adjust the amount fed appropriately. Remember, calories from treats should comprise no more than 10% of the total calories per day to prevent dietary imbalances.²¹

The cat's daily food allowance should be split into multiple small meals and fed throughout the 24 h period, using puzzle feeders when possible.



Frequent meals and appropriate nutrition

The cat's daily food allowance should be split into multiple small meals and fed throughout the 24 h period, using puzzle feeders when possible. Automatic feeders can also be helpful, although they do not typically provide for foraging and predation. Owners must ensure that their cat is actually eating an

appropriate amount and that food placement is such that the cat is able to procure it. Weight and body condition need to be monitored regularly, especially in cats that are aged or debilitated, or have chronic illnesses or particular needs. It is imperative that the veterinary team also educates owners on how to evaluate their cat's behavior for signs of illness, evidence of stress from inter-cat tension, food bowl guarding or other problems, both in general and associated with the feeding program.¹³

Veterinarians should counsel their clients as to how many calories their cat should eat on a daily basis (see 'Nutritional reminder' box) and help determine the best way to measure food portions, either by using a digital gram kitchen scale or by volume using a measuring cup. (Note that some owners have been found to be inaccurate when measuring portions using the cup method.²³) Food can be measured when filling feeding stations and then measured again 24 h later to determine how much has been eaten.

Separate resource areas for multi-cat households

Just because cats will eat together does not mean that they would not greatly benefit from separate feeding areas. Forcing a cat to eat in proximity to another cat that it otherwise chooses to avoid creates anxiety, stress and health problems.

Therefore, the first task is to determine the household group dynamics to help direct where feeding and water stations (as well as litter box resources) should be located. These questions should be answered by the owner: Which cats spend time together? Which cats avoid each other? Where does each cat spend its time?

Feeding plans should include multiple feeding stations that are visually separated.^{6,12} Feeding station placement should consider the agility of each cat (to utilize elevated spaces such as shelves or tables) and dietary needs. Meals can be offered through programmable feeders, some of which utilize individual microchips. Feeding areas can also be separated by baby gates, or by using size-limiting entrances to access the food.^{5,24} Cats should be fed in locations where they feel safe.^{6,12} Additionally, feeding stations should not be close to litter boxes.^{6,12}

SUMMARY POINTS

- ❖ As part of providing optimal healthcare to our feline patients, it is crucial to share with our clients the importance of optimizing not only what to feed, but also how to feed.
- ❖ Engaging the cat's predatory, foraging and play behaviors to meet its environmental needs with puzzle feeders and multiple small meals reduces inactivity, anxiety and obesity.
- ❖ In multi-cat households, offering separate feeding stations with adequate distance and visual separation between stations, and taking advantage of elevated space, can reduce stress and associated health issues.
- ❖ Helping clients develop feeding strategies to meet each cat's individual needs, as well as an overall plan that works in their own households, should be an important part of nutritional counseling at each veterinary visit.



Forcing a cat to eat in proximity to another cat that it otherwise chooses to avoid creates anxiety, stress and health problems.



Recommended additional resources for you and your clients

- ❖ Ellis S, Rodan I, Carney HC, et al. **AAFP and ISFM feline environmental needs guidelines.** *J Feline Med Surg* 2013; 15: 219–230. Freely accessible at guidelines.jfms.com.
- ❖ Ellis S and Rowe E. **Five-a-Day Felix. A report into improving the health and welfare of the UK's domestic cats.** <http://bit.ly/Five-A-DayFelix>.
- ❖ www.foodpuzzlesforcats.com.
- ❖ Hammerle M, Horst C, Levine E, et al. **2015 AAHA canine and feline behavior management guidelines.** *J Am Anim Hosp Assoc* 2015; 51: 205–221.
- ❖ Rodan I, Sundahl E, Carney H, et al. **AAFP and ISFM feline-friendly handling guidelines.** *J Feline Med Surg* 2011; 13: 364–375. Freely accessible at guidelines.jfms.com.
- ❖ Ellis S and Sparkes A. **Feline stress and health: managing negative emotions to improve feline health and wellbeing.** ISFM Guide. Tisbury, UK: ISFM, 2016.

See also the accompanying client brochure in the Appendix (pages 1054–1055).

Acknowledgements

The AAFP Panel gratefully acknowledges the contributions of Dr Kim Farina, for her veterinary and literary consultation and skills in the preparation of the Consensus Statement.

Conflict of interest

Dr Ilona Rodan is an independent consultant for the Advisory Council for Royal Canin. Dr Beth Hamper is an independent consultant for Freshpet. The other authors do not have any potential conflicts of interest to declare.

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

References

- 1 Dantas LMS, Delgado MM, Johnson I, et al. **Food puzzles for cats: feeding for physical and emotional wellbeing.** *J Feline Med Surg* 2016; 18: 723–732.
- 2 Fitzgerald BM and Turner DC. **Hunting behaviour of domestic cats and their impact on prey populations.** In: Turner DC and Bateson P (eds). *The domestic cat: the biology of its behaviour*. 2nd ed. Cambridge, UK: Cambridge University Press, 2000, pp 151–175.
- 3 Turner DC. **Social organization and behavioural ecology of free-ranging domestic cats.** In: Turner DC and Bateson P (eds). *The domestic cat: the biology of its behavior*. 3rd ed. Cambridge, UK: Cambridge University Press, 2014, pp 64–70.
- 4 Amat M, de la Torre JLR, Fatjó J, et al. **Potential risk factors associated with feline behaviour problems.** *Appl Anim Behav Sci* 2009; 121: 134–139.
- 5 Buffington CT, Westropp JL and Chew DJ. **From FUS to Pandora syndrome: where are we, how did we get here, and where to now?** *J Feline Med Surg* 2014; 16: 385–394.
- 6 Ellis S, Rodan I, Carney HC, et al. **AAFP and ISFM feline environmental needs guidelines.** *J Feline Med Surg* 2013; 15: 219–230.
- 7 Bradshaw JWS. **The evolutionary basis for the feeding behavior of domestic dogs (*Canis familiaris*) and cats (*Felis catus*).** *J Nutr* 2006; 136 Suppl: 1927S–2931S.
- 8 Plantinga EA, Bosch G and Hendriks WH. **Estimation of the dietary nutrient profile of free-roaming feral cats: possible implications for nutrition of domestic cats.** *Br J Nutr* 2011; 106: S35–S48.
- 9 Kasanen IHE, Sørensen DB, Forkman B, et al. **Ethics of feeding: the omnivore dilemma.** *Anim Welf* 2010; 19: 37–44.
- 10 Stella JL and Croney CC. **Environmental aspects of domestic cat care and management: implications for cat welfare.** *Sci World J* 2016; 2016: 6296315.
- 11 Bernstein P and Strack M. **A game of cat and house: spatial patterns and behavior of 14 domestic cats (*Felis catus*) in the home.** *Anthrozoos* 1996; 11: 25–39.
- 12 Desforges, EJ, Moesta A and Farnworth MJ. **Effect of a shelf-furnished screen on space utilisation and social behaviour of indoor group-housed cats (*Felis silvestris catus*).** *Appl Anim Behav Sci* 2016; 178: 60–68.
- 13 Amat M, Camps T and Manteca X. **Stress in owned cats: behavioural changes and welfare implications.** *J Feline Med Surg* 2016; 18: 577–586.
- 14 Ellis SL. **Environmental enrichment: practical strategies for improving feline welfare.** *J Feline Med Surg* 2009; 11: 901–912.
- 15 McMillan F. **Stress-induced and emotional eating in animals: a review of the experimental evidence and implications for companion animal obesity.** *J Vet Behav* 2013; 8: 376–385.
- 16 Rowe E, Browne W, Casey R, et al. **Risk factors identified for owner-reported feline obesity at around one year of age: dry diet and indoor lifestyle.** *Prev Vet Med* 2015; 121: 273–281.
- 17 Slingerland LI, Fazilova VV, Plantinga EA, et al. **Indoor confinement and physical inactivity rather than the proportion of dry food are risk factors in the development of feline type 2 diabetes mellitus.** *Vet J* 2009; 179: 247–253.
- 18 Stella JL, Lord LK and Buffington CT. **Sickness behaviors in response to unusual external events in healthy cats and cats with feline interstitial cystitis.** *J Am Vet Med Assoc* 2011; 238: 67–73.
- 19 Koolhaas JM, Korte SM, De Boer SF, et al. **Coping styles in animals: current status in behavior and stress-physiology.** *Neurosci Biobehav Rev* 1999; 23: 925–935.
- 20 Stella JL and Buffington CAT. **Individual and environmental effects on health and welfare.** In: Turner DC and Bateson P (eds). *The domestic cat: the biology of its behavior*. 3rd ed. Cambridge, UK: Cambridge University Press, 2014, pp 186–200.
- 21 Wigglesworth D, Hackett R, Holmes K, et al. **Using environmental and feeding enrichment to facilitate feline weight loss.** *J Anim Physiol Anim Nutr (Berl)* 2005; 89: 427.
- 22 National Research Council (US). **Ad Hoc Committee on Dog and Cat Nutrition. Nutrient requirements of dogs and cats.** Washington, DC: National Academies Press, 2006, pp 28–48.
- 23 German AJ, Holden SL, Mason SL, et al. **Imprecision when using measuring cups to weigh out extruded dry kibbled food.** *J Anim Physiol Anim Nutr (Berl)* 2011; 95: 368–373.
- 24 Ellis S and Rowe E. **Five-a-Day Felix. A report into improving the health and welfare of the UK's domestic cats.** <http://bit.ly/Five-A-DayFelix> (2017, accessed January 15, 2018).

Available online at jfms.com

Article reuse guidelines: sagepub.co.uk/journals-permissions
For reuse of images only, contact the AAFP

Appendix: Client brochure

How to Feed a Cat

Addressing Behavioral Needs



You are an important member of your cat's healthcare team.
You are instrumental in helping with the success of
treatments and improved healthcare for your cat.

Download in
easy-to-print
brochure formats at
[www.catvets.com/
client-brochures](http://www.catvets.com/client-brochures).

How to Feed a Cat

Addressing Behavioral Needs



What we feed our cats is very important, but so is *how* we feed them. How we feed our cats can affect them physically and emotionally.

All cats are carnivores (meat eaters), so they have a strong hunting instinct. They also prefer to eat alone and multiple small meals daily.

Satisfying the need to hunt and eat small meals alone, will make your cat happier and healthier, and avoid over or underfeeding. This may include using puzzle or automatic feeders, and in multiple cat homes arranging food and water to reduce stress between your cats.

CURRENT FEEDING METHODS

Your cat's environment, including feeding routine, positively or negatively impacts quality of life. Most pet cats rely on humans for food. Cats are frequently fed in one location with relatively large volumes of food once or twice a day. Many cats always have food available.

In homes with multiple cats, some cats may not get along with others. Even though cats will eat together, group feeding can cause gorging, feeding aggression, and even weight issues. Cats are very good at hiding signs of distress, so even though they may not show you clear signs of anxiety or fighting when eating together, underlying anxiety and stress affects their wellbeing.

Obesity-related problems:

- Feeding one or two large meals does not meet a cat's need to eat many small meals. This approach to feeding can lead to inactivity, stress, overeating, and obesity.
- If a cat is bored, eating can become an activity, leading to obesity. Overweight cats have more difficulty performing physical activities such as jumping, climbing, hunting and playing. Obesity can also lead to health problems such as diabetes, arthritis, high blood pressure, and heart and respiratory disease.

Stress related problems:

- Stress can lead to medical issues such as cystitis (bladder inflammation), and can contribute to litter box issues.
- A cat may eat too quickly in order to return to their safe space if they are trying to avoid a stressful encounter with another pet or a household member such as an active toddler.
- If a cat is not able to access food regularly, because of the possibility of a stressful encounter with another pet or child, they may eat too little or overeat.

DEVELOP FEEDING SOLUTIONS FOR YOUR CAT

When creating feeding plans, mimic the cat's natural feeding behavior. This reduces begging for food, feline frustration, and inter-cat conflict.

Puzzle Feeders and Hunting

Puzzle feeders (food puzzles) are objects that hold food and must be handled by the cat to get the food out. Using puzzle feeders and even hiding kibbles around the home increases activity, and provides mental and physical stimulation. There are many types of puzzle feeders you can buy, or easily make at home. Puzzle feeders vary in their complexity, can be motionless or rolling, and can be designed for dry or wet foods. Always start with simple puzzle feeders first because your cat needs to learn how to use them.

As your cat gets comfortable with using them, you can slowly make them more difficult. For more information on puzzle feeders, visit www.catfriendly.com/howtofeedcats.

Encourage your cat to hunt and forage for food by placing kibbles and treats in different locations. Be patient and slowly incorporate new feeding methods.

Frequent Meals and Appropriate Nutrition

Divide your cat's daily food allowance into multiple small meals fed throughout the 24-hour period. Use puzzle feeders when possible. Automatic feeders can also be helpful although they do not typically provide for hunting or foraging.

Make sure your cat is actually eating an appropriate amount, especially if you have more than one cat. Contact your veterinarian to discuss how many calories your cat should eat. Food needs to be located where your cat can reach it.

If your cat is over or undereating, or if you are having trouble feeding one or multiple cats in your home, please contact your veterinarian for advice. Weight and body condition need to be monitored by you and your veterinarian regularly, especially in cats that are older, have chronic illnesses or conditions, or special needs.

SEPARATE RESOURCES FOR HOMES WITH MULTIPLE CATS

Remember, just because cats *will* eat together, does not mean they *should*. Forcing a cat to eat in proximity to another cat that they otherwise try to avoid often creates anxiety, stress, and health problems.

In multiple pet households, offer separate feeding stations with distance and visual separation between cats, as well as utilize elevated space, to reduce stress and associated health issues.

First, determine the household group dynamics to best locate food and water stations (as well as litter boxes). Ask yourself these questions: Which cats spend time together? Which cats avoid each other? Where does each cat spend their time? Place food, water, and litter boxes accordingly.

Next:

- Watch for signs of anxiety or tension during feeding time. Cats need to feel safe when eating. When cats are anxious or tense, you may see vigilant behavior including constant looking around, approaching the food with caution, ear flattening or positioned sideways in 'airplane' position, or a hunched or crouched posture.
- Make sure each cat has their own food and water bowl. These should be in a separate location for each cat. Some cats that are able to jump may prefer to eat on counters or other elevated spaces. It may be helpful to put food and water bowls where each cat spends most of their time, but not close to litter boxes.
- Make sure that one cat does not 'guard' or 'commandeer' the food.
- Place food with a visual separation so cats cannot see one another.
- Meals can be offered through programmable feeding bowls; some utilize individual microchips, only allowing one cat to access the bowl.



Cats need to hunt and search for food, and to eat multiple small meals each day in privacy. You can meet these needs with puzzle feeders and by portioning food throughout the day, which reduces inactivity, anxiety, and obesity. Your veterinarian can help you develop a feeding strategy to meet your cat(s)' individual needs, and an overall plan that works in your household.



www.catvets.com
www.catfriendly.com

For more information on how to feed a cat, visit www.catfriendly.com/howtofeedcats.

This was developed from the AAFP Consensus Statement on Feline Feeding Programs: Addressing Behavioral Needs to Improve Feline Health and Wellbeing. © Copyright 2018 AAFP. All rights reserved.