

## Obesity Risk Factors

Excess calorie consumption	Causes	Management
	<b>Human factors</b>	
<b>Overfeeding primary diets</b>	<ul style="list-style-type: none"> <li>Lack of pet owners' awareness of               <ul style="list-style-type: none"> <li>Calorie density of food</li> <li>Pet's caloric needs</li> <li>How to feed pet (ad libitum vs meal feeding)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Calculate MER using ideal weight               <ul style="list-style-type: none"> <li>Compare with current intake</li> </ul> </li> <li>Weigh food using a gram scale to improve precision and accuracy vs measuring cups<sup>72,74,77</sup></li> <li>Caution when following commercial product feeding recommendation labels               <ul style="list-style-type: none"> <li>May overestimate energy requirements, causing overfeeding</li> </ul> </li> <li>Use kibble as treats</li> <li>Switch to diet with reduced energy density</li> <li>Use short handouts for feeding recommendations to help inform all members of the household</li> </ul>
<b>Eating the other pets' food</b>	<ul style="list-style-type: none"> <li>If one pet eats faster than the other or can "bully" the other pet, one pet is eating the calories of two</li> </ul>	<ul style="list-style-type: none"> <li>Feed pets separately</li> <li>Use automated feeders or feeders that identify pets via collar tag or microchip               <ul style="list-style-type: none"> <li>Ensure they provide a measured amount</li> </ul> </li> <li>Use food-dispensing and/or foraging toys to control intake and provide enrichment and activity</li> </ul>
<b>Too many treats (&gt;10% of diet)</b>	<ul style="list-style-type: none"> <li>Dilute the nutrition of the primary food</li> </ul>	<ul style="list-style-type: none"> <li>Use multiple terms to capture all items being fed (e.g., treats, snacks, desserts, toppers, table foods, food scraps, human food, meal leftovers, foods for medication administration)               <ul style="list-style-type: none"> <li>Use communication strategies to elicit a more complete response</li> </ul> </li> <li>Supplements (e.g., fish oil, chewable tablets, soft chews) also contain calories</li> <li>Keep total treat intake ≤10% of daily caloric intake               <ul style="list-style-type: none"> <li>Avoids disrupting nutrient balance of primary diet</li> </ul> </li> <li>Use kibble as treats by separating out a portion of the daily primary diet quantity</li> <li>Measure treats into a daily treat jar</li> <li>Mix high- and low-calorie treat items for training</li> <li>Educate owners that carrots, green beans, and other human foods have calories, too</li> <li>Consider unintentional sources (e.g., waiting by a child's highchair, licking dinner dishes, food dropped during human food preparation process)</li> </ul>
<b>Animal factors</b>		
<b>Spay/neuter changes in metabolism</b>	<ul style="list-style-type: none"> <li>Energy requirements decrease and feeding amounts change<sup>34-36</sup></li> <li>Because surgery usually occurs at a young age, it is challenging to feed to support sufficient growth while avoiding excess</li> </ul>	<ul style="list-style-type: none"> <li>Frequent BCS monitoring</li> <li>Consult growth charts<sup>79</sup> <ul style="list-style-type: none"> <li>Not available for cats or giant-breed dogs</li> </ul> </li> <li>If predicting ≥70 lb as adult, use diet formulated for large-breed growth               <ul style="list-style-type: none"> <li>Keep large-breed puppies at ideal BCS to reduce risk of orthopedic disease<sup>15,80</sup></li> </ul> </li> <li>Switch to adult formulation when pet achieves ≥80% skeletal maturity               <ul style="list-style-type: none"> <li>May stay on "all life stages" diets</li> <li>Switching too early may affect nutrients necessary to support development</li> </ul> </li> <li>Consider "birthday visit" to evaluate pet when transitioning between growth and maintenance life stages</li> </ul>

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## Obesity Risk Factors, Continued

Decreased energy expenditure	Causes		Management
	Human factors		
<b>Overestimate pet's activity level</b>	<ul style="list-style-type: none"> <li>• Owners believe their pets are more active than they actually are<sup>30</sup></li> <li>• Insufficient exercise leads to unintentional weight gain<sup>32</sup></li> </ul>		<ul style="list-style-type: none"> <li>• Ask about specific types of activity and amount to get full picture</li> <li>• Educate owners that exercise plays a minimal role in weight loss compared with diet</li> <li>• Up to 30–60 min walking/trotting 3×/wk can result in muscle and adipose tissue changes, suggesting improved glucose metabolism<sup>81</sup></li> <li>• Increasing exercise may               <ul style="list-style-type: none"> <li>• Increase energy expenditure<sup>82</sup></li> <li>• Maintain lean body mass<sup>75</sup></li> <li>• Strengthen human-animal bond<sup>83</sup></li> </ul> </li> <li>• Fitness trackers may motivate owners to exercise their dogs<sup>31</sup></li> <li>• Consider feather toys, laser pointers, cat trees, exercise wheels for cats</li> </ul>
Animal factors			
<b>Age-related issues</b>	<ul style="list-style-type: none"> <li>• Obesity prevalence increases through middle age<sup>46,47</sup></li> <li>• Energy requirements may decrease with age, but this is not consistent               <ul style="list-style-type: none"> <li>• Influenced by breed and respective life expectancy<sup>52</sup></li> </ul> </li> <li>• Lean body mass decreases with age in dogs</li> <li>• Fat, protein, and energy digestibility decreases with age in cats               <ul style="list-style-type: none"> <li>• Cats will compensate by increasing total caloric intake<sup>56</sup></li> </ul> </li> </ul>		<ul style="list-style-type: none"> <li>• Always assess BCS and MCS               <ul style="list-style-type: none"> <li>• Adjust feeding plan as needed as soon as changes occur</li> </ul> </li> <li>• Encourage routine exercise and activity</li> <li>• Remember that cats may actually need an increased calorie intake later in life</li> </ul>
<b>Genetic predisposition</b>	<ul style="list-style-type: none"> <li>• Certain breeds (e.g., Labrador retrievers, beagles, Norwegian forest cats, Persians) are predisposed<sup>37–46</sup></li> </ul>		<ul style="list-style-type: none"> <li>• Inform owners of breeds with known predisposition, even if currently ideal BCS</li> <li>• Consider breed-specific diets for likely controlled energy density with at-risk breeds</li> </ul>

BCS, body condition score; MER, maintenance energy requirement; MCS, muscle condition score.

**The 2021 AAHA Nutrition and Weight Management Guidelines for Dogs and Cats are available at [aaha.org/nutrition](http://aaha.org/nutrition).**

These guidelines were prepared by a Task Force of experts convened by the American Animal Hospital Association (AAHA) and were subjected to a formal peer-review process. This document is intended as a guideline only, not an AAHA standard of care. These guidelines and recommendations should not be construed as dictating an exclusive protocol, course of treatment, or procedure. Variations in practice may be warranted based on the needs of the individual patient, resources, and limitations unique to each individual practice setting.