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Original paper



## Obesity in Dog

Avani Singh\*, Prachi Dhaka, Sunil Kumar Bhardwaj, Shivam Sharma and Pavan Kumar Mittal

*Department of Veterinary Physiology and Biochemistry,  
Post Graduate Institute of Veterinary Education and Research, Jamdoli, Jaipur, Rajasthan-302031  
\*Corresponding Author: [avani7795@gmail.com](mailto:avani7795@gmail.com)*

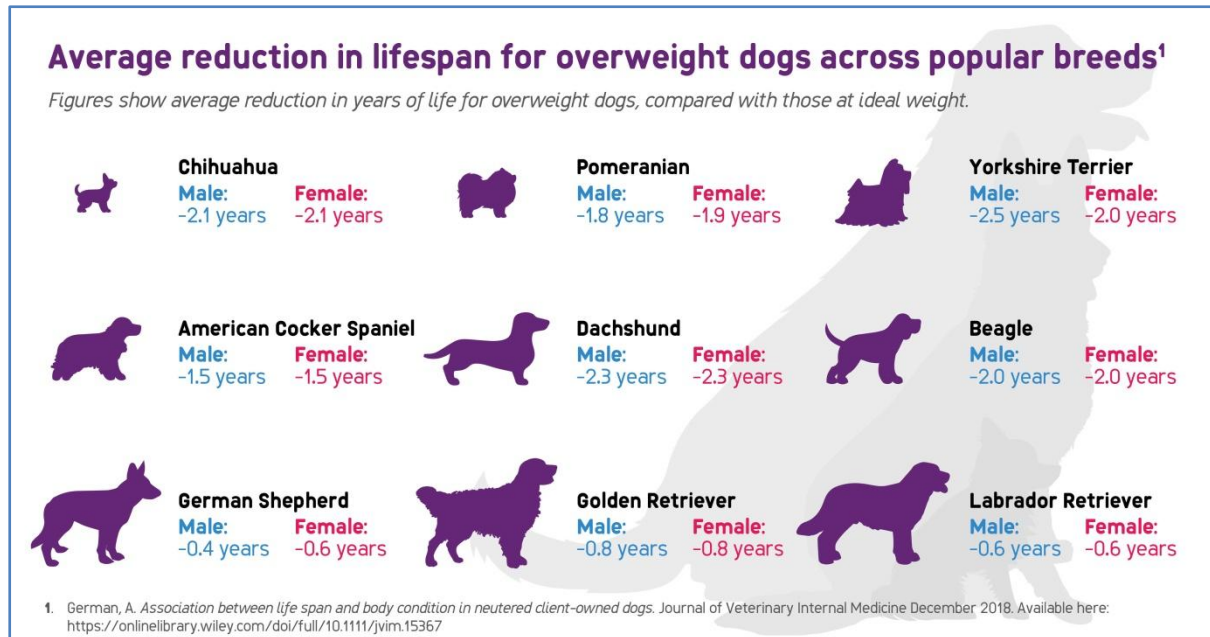
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### Introduction

Dog obesity is a growing problem among pet owners, and it is important to understand why it is a concern. Obesity is described as an abnormal build-up of adipose or fatty tissue in the body. Obesity in dogs is described as being more than 15% above their ideal body weight but because of breed and body size differences, determining appropriate body weight is challenging. A lifetime study of dogs revealed that even mildly overweight canines were at higher risk of morbidity and had a shorter median lifespan. The problems to which obese companion animals may be predisposed include orthopaedic disease, diabetes mellitus, abnormalities in circulating lipid profiles, cardiorespiratory disease, urinary disorders, reproductive disorders, cancers (mammary tumours, transitional cell carcinoma), and dermatological diseases. Adipose tissue is largely composed of adipocytes and preadipocytes, as well as supportive cells such as endothelial cells, fibroblasts, macrophages, and leukocytes. Adipose tissue produces hormones, cytokines, and other cell-signaling chemicals known as adipokines, which may contribute to obesity-related disorders. Many adipokines can be classified as being engaged in energy balance or metabolism, pro- or anti-inflammatory control, or insulin resistance promoters.

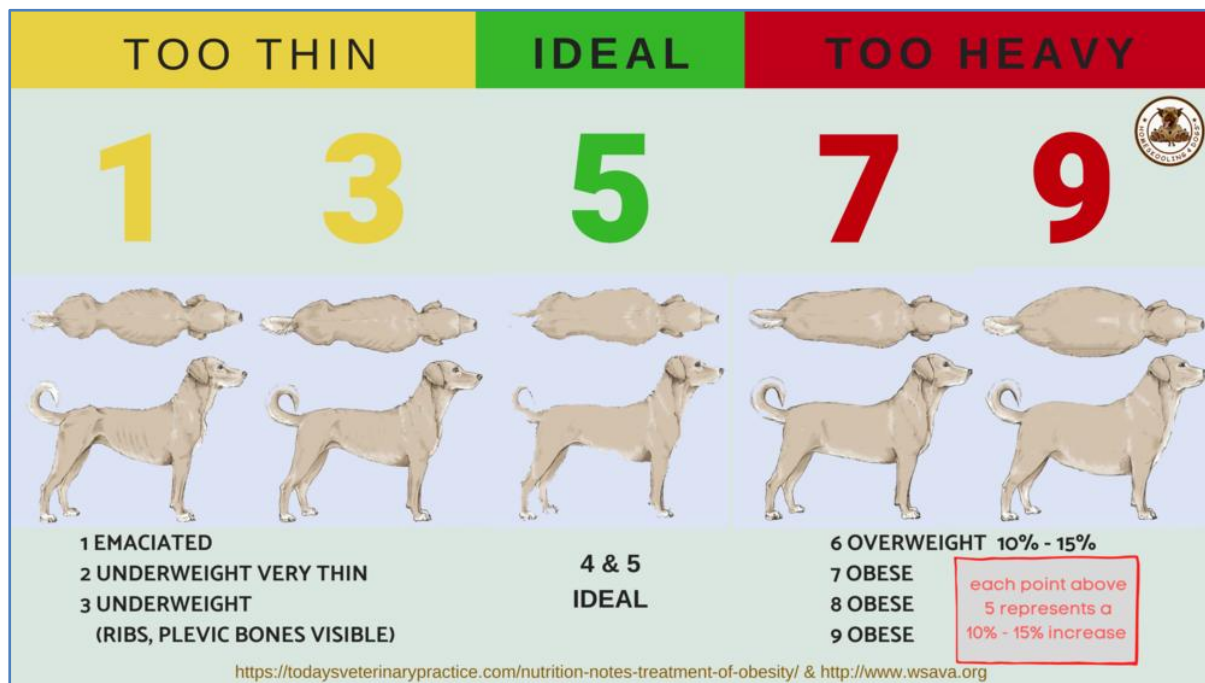
Leptin is the most well-studied hormone generated by adipose tissue. Leptin secretion rises with obesity, and the key roles of this hormone have been identified as hunger and energy management. Leptin causes the hypothalamus to lower appetite and food intake in typically sensitive dogs; however, many obese dogs appear to be resistant to leptin's effects. TNF- $\alpha$ , IL-1, and IL-6, as well as C-reactive protein (CRP), are among the inflammatory cytokines secreted in larger quantities from adipose tissue in obese patients. Tumour Necrosis factor has direct endocrine effects on energy metabolism, and it increases inflammation and insulin resistance by inhibiting insulin receptor activation.



Interleukin-1, IL-6, and CRP all contribute to insulin resistance through distinct mechanisms while also causing inflammation. Several genes have been linked to obesity in dogs like FTO (Fat mass and obesity-associated), BDNF (Brain-derived neurotrophic factor), MC4R (Melanocortin 4 receptor), PCSK1 (subtilisin-like proproteinconvertase), MC3R, and PPARG (peroxisome proliferator-activated receptor) were identified as intriguing candidate genes for canine obesity. POMC (proopiomelanocortin), another potential gene identified by Mankowska et al., was found to have a high connection with weight and hunger in obese Labrador retrievers. Although variables such as genetics, growing age, gender (female), breed, and being neutered enhance the risk of obesity; the illness is ultimately caused by inappropriate food and exercise habits of carers (owners) towards their pets. Obesity is caused by an excess of food energy consumed in comparison to their needs, as well as insufficient exercise/physical activity. The human-animal interaction, in which the owner influences food selection, composition, feed management, and exercise schedule, potentially magnifies this i.e. eating more calories than they are burning. One of the biggest challenges in addressing dog obesity is that many owners do not realize their pet is overweight. This is because dogs tend to carry their extra weight in different ways, and some breeds are naturally more muscular or have more fur, which can make it difficult to determine if a dog is overweight. Carciofi et al. (2005) mentioned problems such as a lack of time to exercise the dog and the expense of specialist dog diets as hurdles to compliance with weight reduction therapy.

It is important to monitor a dog's weight and adjust its diet and exercise routine as needed. A body condition score is an effective way to determine if a dog is overweight. The owner should be able to feel the ribs easily with a light covering of fat, and there should be a noticeable waist. If the ribs cannot be felt and there is no waist, the dog is most certainly overweight. Another way to check for dog obesity is to measure the waist. To do this, the owner should place their hands on the dog's sides just behind the ribcage and measure the circumference of the waist. If the waist is wider than the ribcage, the

dog is likely overweight. Dogs that are overweight may have a harder time with physical activity, such as jumping and running. Observing a dog's physical activity level can indicate whether the dog is overweight. It is important to remember that every dog is different and that the best way to determine if a dog is overweight is to consult a veterinarian.



To help prevent dog obesity, owners should start by feeding their pets a balanced diet. This means choosing high-quality dog food that is appropriate for their age, size, and activity level and measuring their portions carefully to avoid overfeeding. Additionally, owners should encourage their dogs to be physically active, either through regular walks, playtime, or trips to the park. It is also important to be mindful of treats and human food, as these can contribute significantly to a dog's calorie intake. Treats should be given in moderation, and owners should opt for healthier options. Human food should be avoided mostly, as it is formulated for human nutritional needs and may not provide the right balance of nutrients that dogs require and additionally be high in calories. Feeding dogs a diet high in human food can result in nutrient imbalances and deficiencies, leading to health problems over time. Some dogs may be intolerant to certain ingredients found in human food, such as dairy, wheat, or soy. These ingredients can cause digestive problems, such as vomiting and diarrhea, and foods such as chocolate, grapes, and onions, are toxic to dogs. Fried foods and fatty meats are high in unhealthy fats that can cause weight gain, obesity, and other health problems in dogs. In conclusion, dog obesity is a serious problem that can lead to a range of health problems. Owners can help prevent obesity by feeding their pets a balanced diet, encouraging physical activity, and being mindful of treats and human food. If a dog is overweight, it is important to address the problem early on, as it can be difficult to reverse once it has become established. By taking steps to prevent dog obesity, owners can ensure their pet stays healthy and happy for years to come.

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