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CANINE OBESITY: A CASE STUDY OF ROTTWEILERS AND THE IMPACT OF DIETARY MODIFICATION

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Abstract

Obesity is a disease that is increasingly recognised as a threat to pets, and organisations have been formed to raise awareness and prevent weight gain in dogs and cats. One of the breeds most affected by obesity is the Rottweiler, with studies confirming that obesity is the second most common disease in this breed. In the current study, a group of eight female Rottweilers from northern Romania were examined medically and nutritionally. The monitored females of the Rottweiler breed were divided into two categories according to the modification of the nutritional plan; therefore, for the first group of four females, both the type of food and the amount of food given were modified, and for the second group of females, the type of food was maintained, but the amount of food given daily was reduced. The study highlights that both reducing daily calorie intake and the use of specialized foods can be effective solutions for managing excess weight.

Key words*: dogs, female, food, nutrition, obesity, Rottweiler.*

INTRODUCTION

Obesity is a disease that is increasingly recognised as a threat to pets, and organisations have been formed to raise awareness and prevent weight gain in dogs and cats. Recent studies in the USA and Europe have shown alarmingly high rates of weight gain in dogs, with 59% of dogs in the USA (APOP, 2022) and between 6% and 69% of dogs in Europe being classified as overweight or obese by veterinarians or owners (Muñoz-Prieto, 2018).

One of the breeds most affected by obesity is the Rottweiler, with studies confirming that obesity is the second most common disease in this breed and that obesity in these dogs is associated with musculoskeletal diseases that are either exacerbated or caused by the degree of obesity in Rottweilers.

Obesity in dogs is a major health concern as it can contribute to a number of serious health issues including joint disease, cardiovascular disease and diabetes. It is also closely linked to certain breed characteristics, and Rottweilers are an important example in this context due to their robust build and tendency to gain weight quickly. In this regard, recent studies have emphasised the importance of careful dietary monitoring and weight management to prevent long-term complications.

MATERIALS AND METHODS

The monitored females of the Rottweiler breed were divided into two categories according to the modification of the nutritional plan; therefore, for the first group of four females, both the type of food and the amount of food given were modified, and for the second group of females, the type of food was maintained, but the amount of food given daily was reduced. The cases were managed both in a veterinary practice and in a kennel in north-eastern Romania, therefore the cases were recorded and followed up with the help of a veterinary software (Digitail) and by making individual files using Excel functions.

In order to observe the weight loss, the females were weighed monthly; during the first nutritional consultation the females were weighed, the height at the withers was recorded for each of them and the individual anamnetic data, food history, physical activity history and routine of each owner were recorded in order to observe possible changes that could be made to achieve a successful weight loss program.

RESULTS AND DISCUSSIONS

As research objectives, we aimed to present the effectiveness of two weight loss programs for Rottweiler females, one based on reducing the amount of food and the other based on the use of a type of food specifically designed for weight loss, also in the secondary aspect, the risks associated with obesity among Rottweiler females and its impact on general health were investigated and discussed.

Presentation of the groups: in the first group, Figure 2, the weights of the females that followed a weight management program with a type of feed adapted for the weight loss period were recorded, each female being given a code instead of her name, such as R1 to R4, because the owners' request not to publish the names was respected. In the second group, Figure 3, the weight variation was recorded for females R5, R6, R7 and R8 who followed the weight loss program that focused on decreasing the portion of food from the food they were already consuming at the time of the consultation.

The females included in the study were between 2 and 4 years of age, an age range that is specific to the young adult category according to the American Animal Hospital Association guidelines (AAHA, 2019). In terms of their reproductive status, they were intact and had not undergone ovariohysterectomy at the time of the nutritional consultation or during the study. They also had no history of gestation or parturition and were considered nulliparous at the time of the dietary assessment and monitoring.

Considering that the individuals analysed may have significant reproductive value, the owners decided to postpone their sterilisation. This decision was also influenced by uncertainties in the literature regarding the impact of sterilisation on longevity in the Rottweiler breed. Some recent studies, such as the one conducted by Joonè et al. (2023), suggest an increase in life expectancy in Rottweilers that have not undergone sterilisation. On the other hand, research focusing on multi-breed populations of dogs, such as that by Hoffman et al. (2018) or Urfer et al. (2019), supports the hypothesis that gonadectomy may contribute to an increase in life expectancy among dogs.

The eight females registered an average weight of 41.3 kg in January 2022, ranging from 37.3 to 46.5 kg, and a height at withers between 53 and 60 cm.

Only one of the eight females did not meet the height standard proposed by the AKC (2022), female R6 weighed 37.3 kg, and had a height at the withers of 53 cm, 3 cm less than the standard, and was classified in body score 5.5. Although the other females were within AKC standards, medical advice and owner experience considered weight loss beneficial to minimise possible orthopaedic risks from excess weight.

According to extensive research conducted on a population of 5321 Rottweilers from several veterinary clinics in England, it highlighted that among the most common conditions found in this breed were obesity and degenerative joint disease, with excess weight exacerbating osteoarticular symptoms, as highlighted in Table 1 (O'Neill, 2017).

Table 1 The occurrence of the most common diseases in Rottweilers (O'Neill, 2017)

Causes of death	Most commonly diagnosed diseases during life
Neoplasia	Aggressiveness (more common in males)
Inability to stand up	Obesity
Gastrointestinal disorders	Otitis
Neurocognitive disorders	Degenerative joint disorders
Undesirable behavior	Dental problems
Musculoskeletal difficulties	Pyotraumatic dermatitis

The nutritional plans were decided and implemented according to the individual anamnesis provided by the owners, and the results were tracked as follows: four females received the same food with only the amount of food decreased, and four females received a weight loss food with an energy density of 2668 kcal/kg.

By the time the nutritional weight-loss program was started, the females were fed a type of adult dry food designed for Rottweilers according to the manufacturer's specifications with an energy density of 3890 kcal/kg. The total amount of food offered daily being 550 g, fed in two portions, morning and evening, and weighed separately using a kitchen scale, each female received a total of 2140 kcal/day.

One essential aspect analysed during the nutritional consultation is the animal's feeding history. This includes details of the type(s) of food given, the actual amounts offered, and the number of daily meals.
In addition, information about the owner's daily schedule was requested to identify the pet's habits and the possibility of adjusting the number of meals per day.
Physical activity was also assessed, including the number of daily walks and the actual duration of play time.
Based on the level of activity, animals were categorised according to FEDIAF standards as follows:
- low activity: less than 60 minutes of physical activity per day, sedentary, inactive animal, spending most of the time sleeping or resting.
- moderate activity: between 60 minutes and 3 hours of daily physical activity.
- high activity: more than 3 hours of daily physical activity, alert, energetic and playful animal (FEDIAF, 2024).

In order to obtain the most realistic assessment, the questions about the animal's diet and activity level should be simplified so that the answers reflect the animal's daily routine as closely as possible (Petrescu et al., 2022).
The diet formulated for weight loss has a low energy density of 2.66 kcal/g, compared with 3.89 kcal/g for breed-specific diets (Figure 1). Reducing energy intake is a key element in body weight management, contributing to the caloric deficit required for weight loss (Petrescu et al., 2024).
As for the high fiber content of 17% in weight loss foods, studies claim that dietary fiber plays a key role in inducing satiety, which helps reduce spontaneous food intake. They also support optimal bowel transit, which is important for maintaining gastrointestinal health during a restrictive diet.
L-carnitine, also present in weight loss foods, is an essential nutrient involved in lipid metabolism. It facilitates the transport of fatty acids to mitochondria, where they are oxidized for energy production (Ringseis et al., 2013).

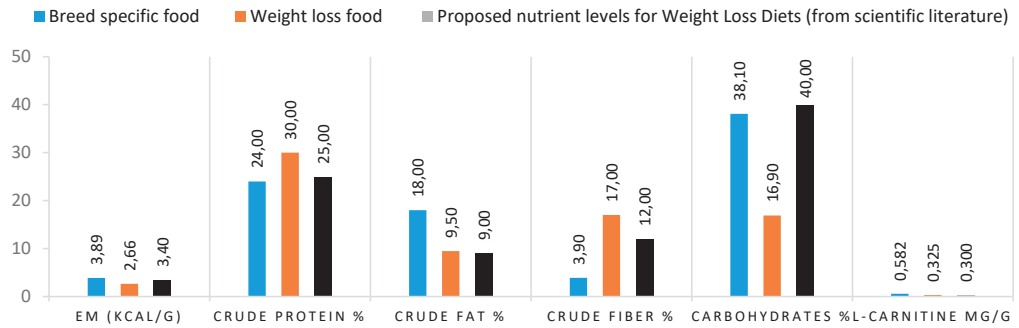
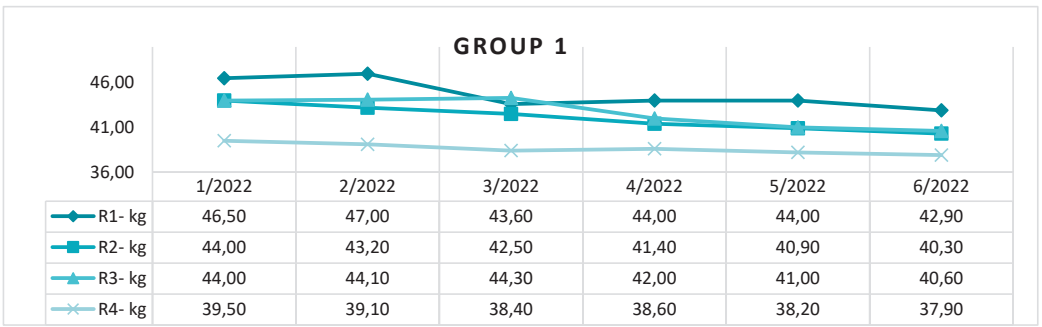
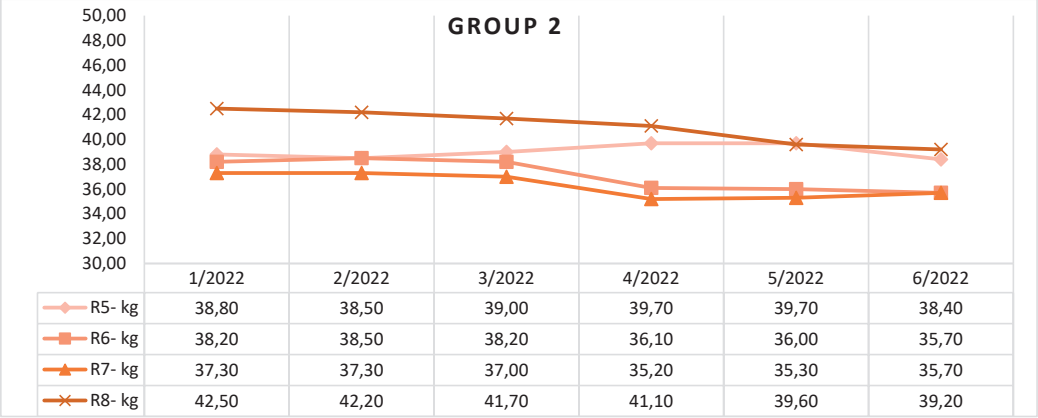


Figure 1. Comparison of nutrient composition and metabolizable energy of dog foods with recommended standards in the literature (Hand et al., 2010) - in black representation



	1/2022	2/2022	3/2022	4/2022	5/2022	6/2022
R1- kg	46,50	47,00	43,60	44,00	44,00	42,90
R2- kg	44,00	43,20	42,50	41,40	40,90	40,30
R3- kg	44,00	44,10	44,30	42,00	41,00	40,60
R4- kg	39,50	39,10	38,40	38,60	38,20	37,90

Figure 2. Group 1 - weight evolution of females (R1, R2, R3, R4) following a nutritional program with weight loss food



	1/2022	2/2022	3/2022	4/2022	5/2022	6/2022
R5- kg	38,80	38,50	39,00	39,70	39,70	38,40
R6- kg	38,20	38,50	38,20	36,10	36,00	35,70
R7- kg	37,30	37,30	37,00	35,20	35,30	35,70
R8- kg	42,50	42,20	41,70	41,10	39,60	39,20

Figure 3. Group 2 - weight evolution of females (R5, R6, R7, R8) following a nutritional program with breed specific food

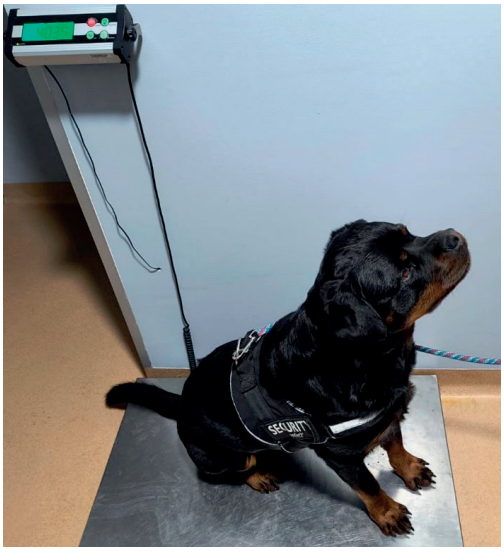


Figure 4. Physical appearance at the end of the nutritional program of the R2 female (own source)

In weight loss diets, L-carnitine helps to reduce fat mass by increasing the utilisation of fat as an energy source, and is particularly beneficial in overweight animals.

According to studies in the formulation of weight loss feeds an optimal protein intake should be ensured, observing that the weight loss feed shown in Figure 1, contains a crude protein intake of 30%, beneficial for the preservation of muscle mass during body weight reduction (German et al., 2010). At the same time, the carbohydrate level is low (16.9%) compared to breed specific feeds (33.1%), thus limiting the energy available from fast sources.

Figure 5. Physical aspect at the end of the nutritional program of the R2 female (own source)

This balancing supports the loss of body fat, while protecting muscle tissue.

There are several factors, however, that can limit the choice of these types of food for certain animals. These include human factors, such as the owners' desire to keep the same food that the animal previously consumed, citing behavioural reasons (e.g. picky eaters), fear of possible digestive problems that may arise from changing the diet, and financial considerations, as specialised weight loss food is often more expensive than standard adult dog food.

In the present study, it was chosen to maintain the same food, at the request of the owners of the females from group 2, in order to ensure consistency in the dog's diet and to facilitate a proper comparison between a food for adult dogs of the breed studied and a special low-fat, high-fiber diet intended for weight loss.

Table 2. Comparison of results obtained with weight loss food (group 1) and special breed food (group 2)

Name	Initial weight (kg)	Final weight (kg)	Weight loss duration (weeks)	Weight loss rate (%)	Average weight loss/week(%)	Initial energy intake (kcal)	DER calculated to achieve the proposed weight (kcal)
Group 1							
R1	46.5	42.9	21	7.7	0.37	2140	1154
R2	44	40.3	21	8.4	0.4	2140	1113
R3	44	40.6	21	7.7	0.37	2140	1113
R4	39.5	37.9	21	4	0.19	2140	1050
Group 2							
R5	38.8	38.4	21	1	0.05	2140	1050
R6	38.2	35.7	21	6.5	0.31	2140	1007
R7	37.3	35.7	21	4.3	0.2	2140	1007
R8	42.5	39.2	21	7.8	0.37	2140	1071

DER = daily energy requirement

The choice of the two types of feed allowed for a relevant comparative study, taking into account behavioral and animal comfort factors as well as financial and digestibility aspects.

A more efficient weight loss (Table 2; Figures 4 and 5) was observed with the use of the prescribed weight loss diet, with Group 1 females having an average weight loss rate of 6.95% compared to Group 2 females on a breed-specific weight management program. This difference is explained by the reduced fat content, controlled caloric intake, and optimised nutrient profile for reduced body mass, characteristic of the diet prescribed for obesity. In addition, all females were advised to increase physical activity by introducing longer walks and increased exercise compared to the previous level. Weight was monitored regularly, and the nutritional plan was adjusted according to individual progress.

CONCLUSIONS

In everyday practice, owner compliance with a new type of food is a significant challenge. Factors such as animal preferences, feed costs and owners' daily habits can influence the implementation of a feeding plan.

Not all cases of obesity can be managed solely by changing the type of food, as other pre-existing conditions such as metabolic disorders, urinary tract disorders, kidney diseases, etc. need to be taken into account. A personalised approach integrating both clinical and nutritional aspects is essential.

Regular weight monitoring and individualised adjustment of the nutritional plan have proven to be key factors in long-term success.

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