

Clinical Evidence for: **WU** Weight Management

KEY POINTS

BLUE Natural Veterinary Diet WU:

1

Is clinically proven to reduce body fat by 39.6% in dogs and 36.8% in cats in two months.

2

Helps maintain:

- Lean body mass during weight loss
- Ideal body weight after weight loss

3

Is formulated to provide an ideal approach for nutritionally managing pets with weight control challenges:

- Added L-Carnitine to facilitate weight loss and maintain lean body mass
- Added Betaine to support oxidation of fat and help protect against hepatic lipidosis during weight loss
- Increased dietary fiber to promote satiety during weight loss
- Ingredients preferred by clients

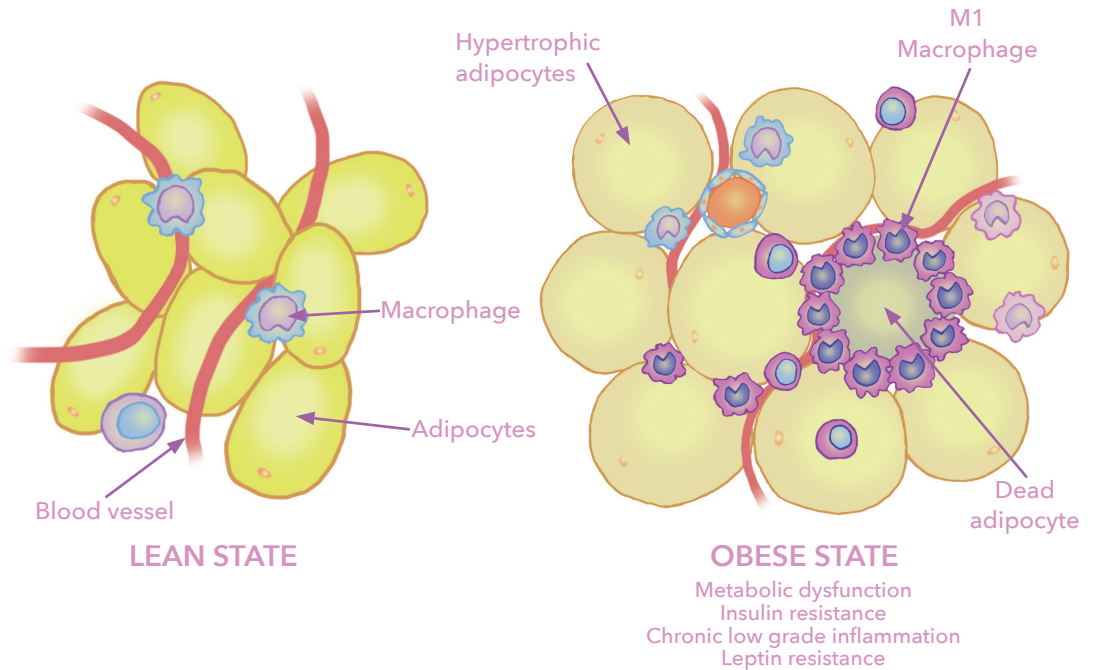


Figure 1. Adipose tissue impacts body metabolism.

Adipose Tissue Metabolism

Originally considered to be an inert tissue that stores fat, adipose tissue is now recognized as one of the more metabolically dynamic organs. In addition to being the primary site of storage for excess energy, it also serves as an endocrine organ capable of synthesizing a number of biologically active compounds that regulate metabolic homeostasis. This tissue is capable of expanding to accommodate increased lipids through hypertrophy of existing adipocytes and by initiating differentiation of pre-adipocytes. Adipose tissue metabolism exerts an impact on whole-body metabolism.

As an endocrine organ, adipose tissue is responsible for the synthesis and secretion of several hormones.¹ These are active in a range of processes, such as control of nutritional intake (leptin, angiotensin), control of sensitivity to insulin and inflammatory process mediators (tumor necrosis factor α

(TNF- α), interleukin-6 (IL-6), resistin, visfatin, adiponectin, among others) and pathways (plasminogen activator inhibitor 1 (PAI-1) and acylation stimulating protein (ASP) for example).²

The expansion of adipose tissue leads to adipocyte hypertrophy in obesity (See Figure 1). The associated recruitment of macrophages from the bloodstream increases infiltration and inflammation with enhanced production of pro-inflammatory cytokines such as tumor necrosis factor α (TNF- α) and IL-6. This is accomplished by increased release of free fatty acids (FFA) and dysregulated secretion of leptin, adiponectin and resistin. The macrophage and adipose tissue-derived adipokines exacerbate adipose tissue inflammation and can lead to decreased muscle and liver insulin sensitivity³ and increased liver glucose production. In

contrast, muscle metabolism is reshuffled to a pattern of low glucose uptake and low FFA oxidation (with increases in levels of glycerol substrate for liver gluconeogenesis). These events lead to an increase of plasma glucose, an increase of insulin resistance and increased risk for a number of health conditions.

Pet obesity continues to be a growing problem, affecting the majority of US dogs and cats. The latest reports indicate that 58 percent of cats and 54 percent of dogs are overweight or obese in the U.S.⁴ Surprisingly, although pet owners may recognize their pets as being overweight, very few considered this to be a health problem.⁵ However, dog and cat owners are not alone as the scientific focus on obesity as a health problem is relatively new. In an epidemiological study conducted less than 20 years ago, even veterinarians did not routinely recognize obese dogs and cats as having a health problem. In that study, veterinarians reported that only 2.0% of dogs and 1.8% of cats were obese, when in fact, 28.3% of dogs and 27.5% of cats were assigned a body condition score at that time that corresponded with overweight or obesity.⁶

OPTIMAL NUTRITION TO MANAGE WEIGHT:

1) CHOOSING THE RIGHT FORMULA

The old adage, “You are what you eat.” is a really important factor when it comes to therapeutic foods for weight loss. A therapeutic food must provide appropriate levels of nutrients in order to optimize health while reducing body fat. Calorie restriction alone is not enough. To address the overall metabolic needs of dogs and cats during weight loss, BLUE Natural Veterinary Diet WU Weight Management + Urinary Care food is formulated with moderate levels of fat and calories to facilitate body fat loss while maintaining lean muscle mass helping minimize the impact of oxidative stress from fat metabolism. Increased levels of

dietary fiber promote satiety and added L-Carnitine helps to facilitate weight loss and help maintain lean body mass in dogs and cats.⁷ Betaine is added to support oxidation of fat and may help protect against hepatic lipidosis during weight loss.⁸

STUDY: CLINICALLY PROVEN WEIGHT LOSS

PURPOSE

To show that feeding BLUE Natural Veterinary Diet WU Weight Management + Urinary Care can result in clinically and statistically significant loss of body weight and body fat, while maintaining lean mass, and thereafter maintain a healthy body weight and composition.

STUDY DESIGN

Two groups of adult overweight / obese dogs (n=15 each for Canine Weight Studies 1 and 2) and 2 groups of adult overweight/obese cats (n=15 for Feline Weight Study 1 and n=11 for Feline Weight Study 2) were enrolled in the studies. All animals selected were otherwise clinically healthy and had a minimum body condition score (BCS) of 3.5/5 and a total body fat of at least 28%, and both males and females were included in the groups. Animals were maintained in standard, species-appropriate housing and managed consistently during the study, including providing access to activity/exercise. The study protocols were reviewed and approved by the research facility’s institutional animal care and use committee.

Animals were fed the species-appropriate dry BLUE Natural Veterinary Diet WU food for up to 4 months for the weight loss portion of the study, and for an additional 4 months thereafter for the weight maintenance portion. They were offered a daily amount of food determined from the weight loss feeding guidelines and the target weight established by the facility veterinarian. The daily amount

of food offered was adjusted during the study to achieve a weekly weight loss of 1-2% for dogs and 1-1.5% for cats. When the animals reached 20% body fat or their ideal weight, they were then fed for an additional 4 months according to weight maintenance feeding guidelines, with feeding amounts adjusted to maintain ideal body weight.

The following assessments were made at study initiation and thereafter: a) Weekly body weight, b) Monthly body composition (body mass as fat/lean/bone mineral) via dual energy x-ray absorptiometry (DEXA) under reversible sedation protocol, c) Monthly physical examination, including BCS, d) Monthly CBC and serum biochemical analysis, e) Monthly measures of key biomarkers of obesity, including glucose and leptin.

RESULTS⁹

Overall, dogs and cats fed BLUE Natural Veterinary Diet WU food lost significant body weight during the weight loss portion of the study. Animals achieved a BCS between 2.5 and 3.5 (with 3 being considered ideal) by 4 months of feeding.

By day 60, dogs lost a mean of 2.39 kg or 16.3% of their initial body weight, approximately 2% loss of initial weight on a per-week basis (P<0.05). Based on mean values for the 2 studies, dogs had lost 2270.5 g, and 39.6% of their initial body fat (P<0.05).

Cats lost a mean of 0.67 kg or 12.5% of their initial body weight, approximately 1.5% loss of initial weight on a per-week basis (P<0.05). Based on mean values for the 2 studies, cats had lost 700.4 g, and 36.8% of their initial body fat (P<0.05).



CHART 1. STEADY AND HEALTHY RATE OF WEIGHT LOSS IN DOGS AND CATS

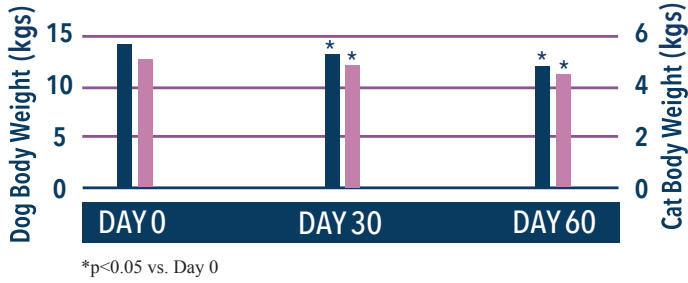
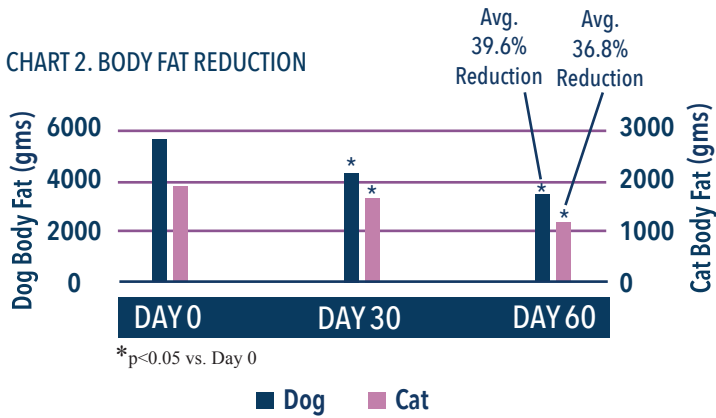


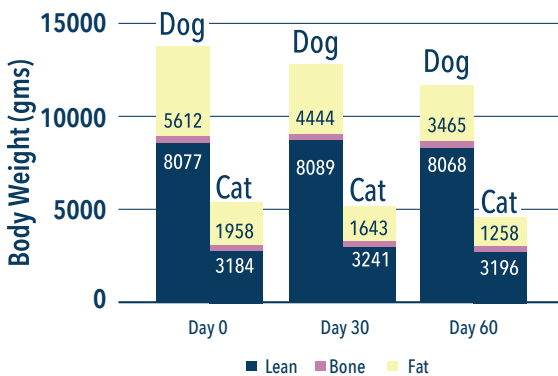
CHART 2. BODY FAT REDUCTION



LEAN BODY MASS MAINTAINED

In addition, dogs and cats maintained lean body mass during the weight loss period. Mean lean body mass was essentially unchanged between days 0 and 60 in both species.

CHART 3. BODY COMPOSITION DURING WEIGHT LOSS

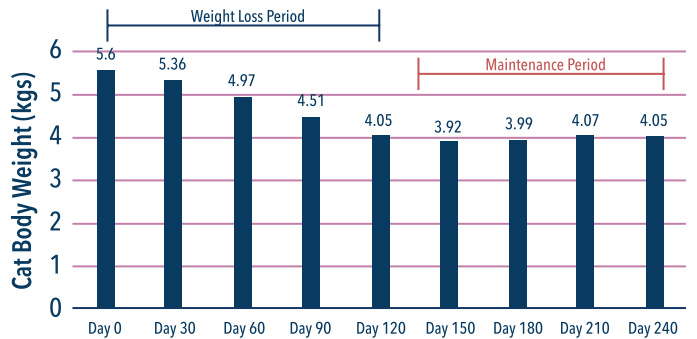


WEIGHT LOSS

Cats also preserved ideal body weight over the 4-month maintenance period. Mean body weight was essentially unchanged between days 150 and 240.

MAINTENANCE AFTER WEIGHT LOSS⁹

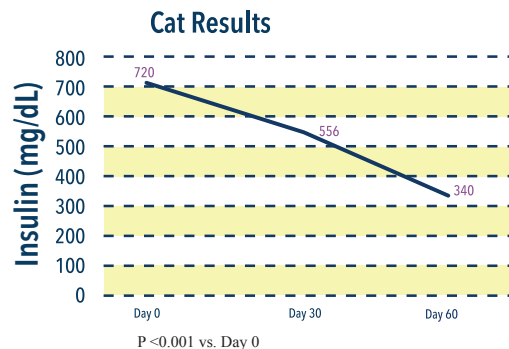
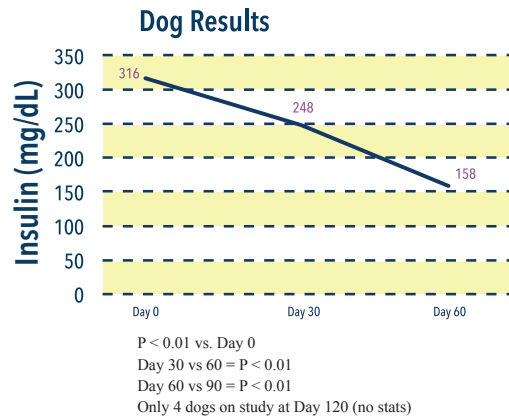
CHART 4. IDEAL BODY WEIGHT MAINTAINED AFTER WEIGHT LOSS



In general and throughout the study, physical examination findings indicated that the animals remained in good general health and blood values remained within historical normal ranges for the facility.

Further, as the dogs and cats that were fed the BLUE Natural Veterinary Diet WU diet lost weight, their insulin and IGF-1 decreased, indicating more normalized glucose levels as well.

CHART 5. INSULIN LEVELS NORMALIZE WITH WEIGHT LOSS.



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CHART 6. DOG LEPTIN LEVELS

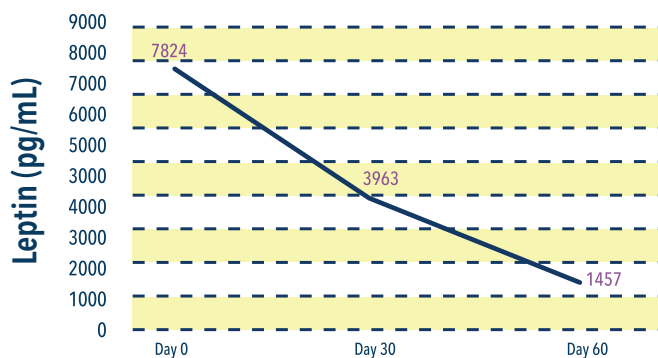
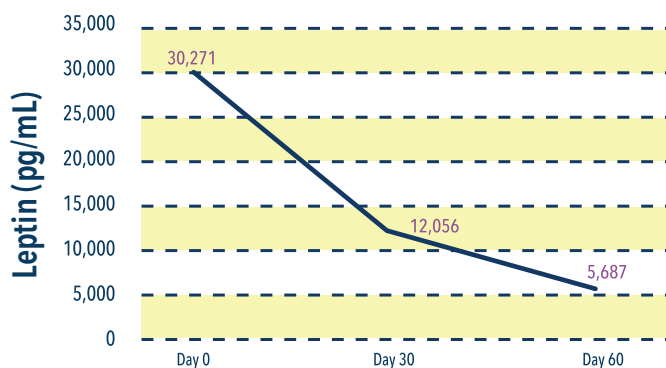


CHART 7. CAT LEPTIN LEVELS



Leptin, a protein manufactured by fats cells, is a key biomarker for fat loss. As body fat mass decreases, leptin levels decrease as well.

2) CLIENT INGREDIENT PREFERENCE

PET OWNER INSIGHTS ¹⁰

In a survey of 300 pet owners, owners report that they prefer the ingredients in BLUE Natural Veterinary Diet WU food 5 to 1 over the ingredients in the leading metabolic or weight management diets for dogs and cats. Meeting client needs and preferences is key to encouraging increased client compliance, especially during and after weight loss.

CLINICAL IMPACT

The studies discussed in this Clinical Report provide support that BLUE Natural Veterinary Diet WU food is clinically effective for dogs and cats to reduce body weight and fat loss while maintaining lean muscle mass during weight loss. Additionally, BLUE Natural Veterinary Diet WU food helps cats maintain a healthy weight after weight loss.

These findings support that BLUE Natural Veterinary Diet WU food provides an ideal approach to nutritionally manage pets during and after weight loss while satisfying pet owner preferences for quality, natural ingredients.

For more information about Blue Buffalo Quality Assurance Testing and Clinical Research please visit TrueBLUEVets.com or call 1-888-323-BLUE.



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