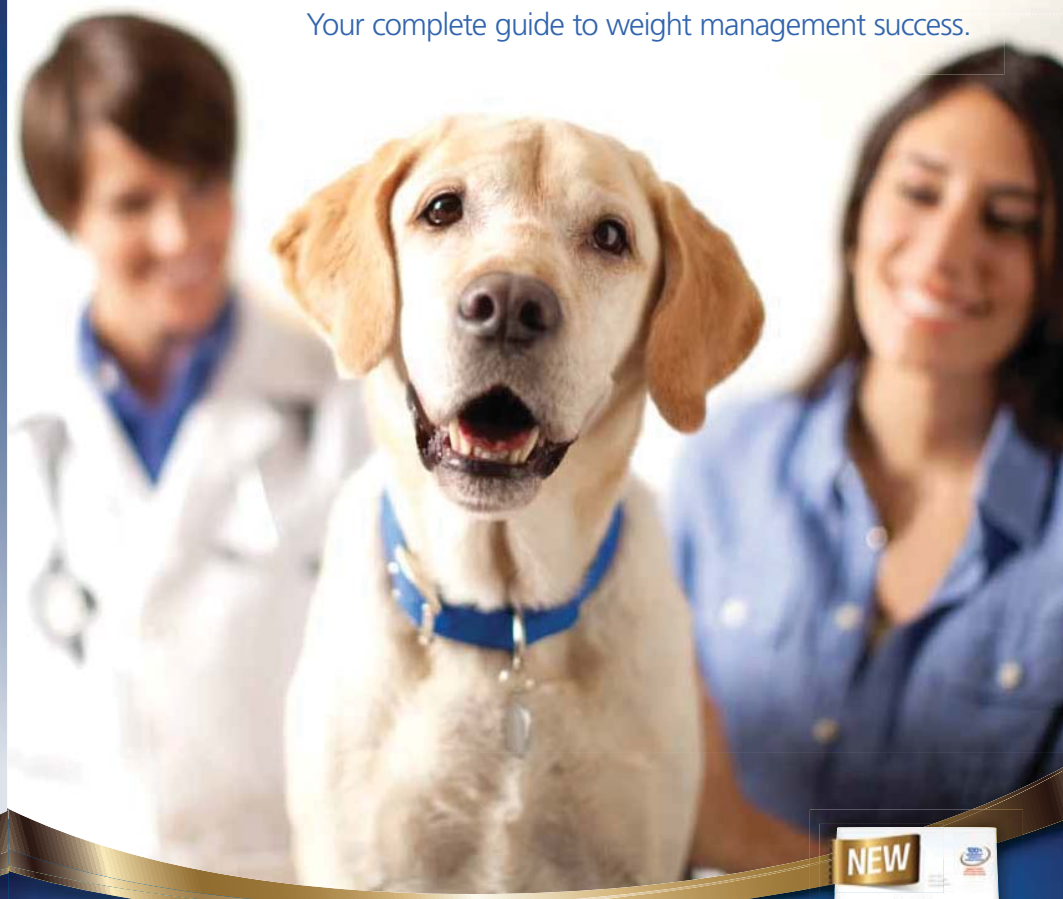
Hill's PRESCRIPTION DIET

Clinical Nutrition to Improve Quality of Life™

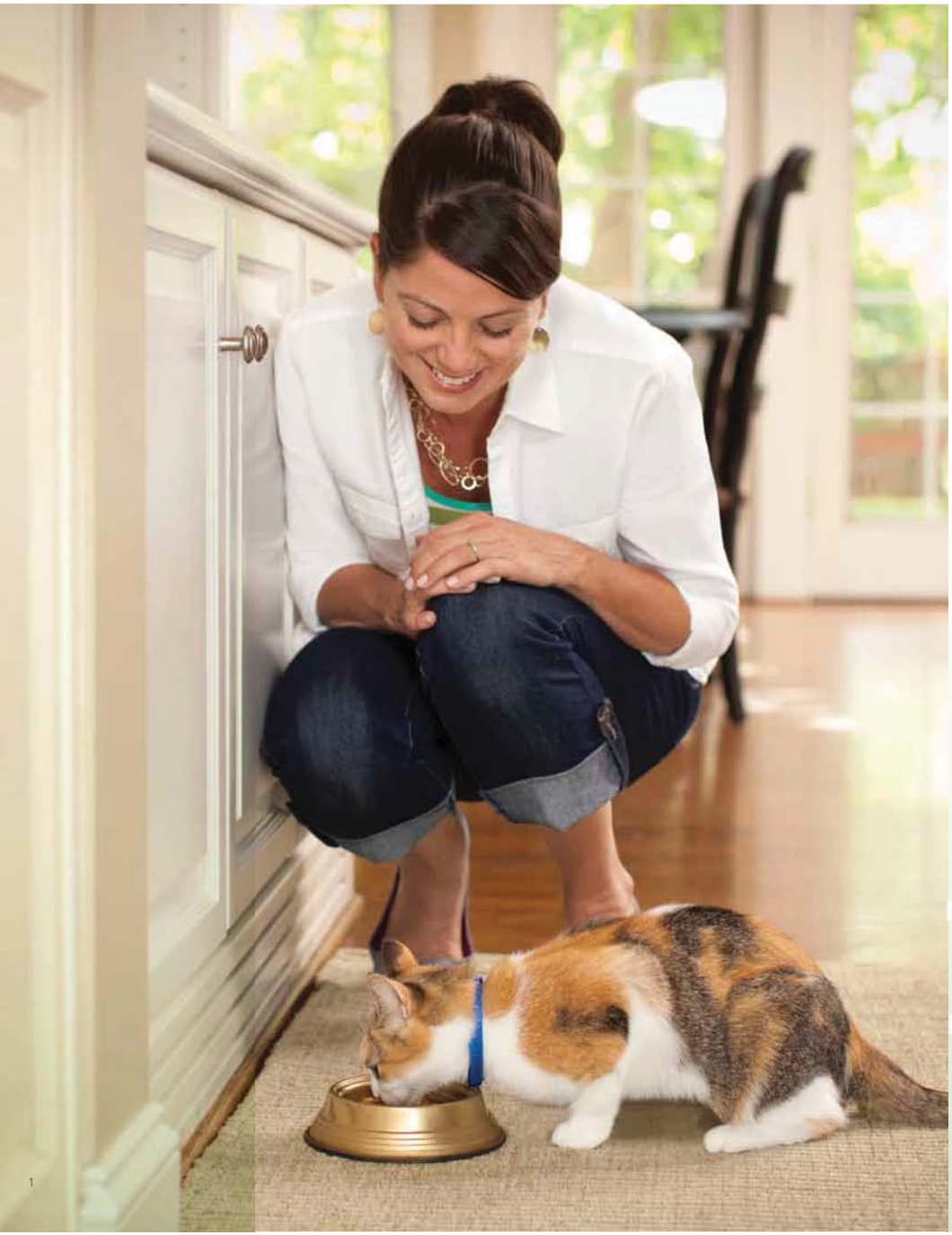
P10046

Real results in the real world.

Your complete guide to weight management success.



HILL'S
HEALTHY WEIGHT
PROTOCOL



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over 1/2 of dogs and cats are now overweight or obese

Based on the results of a 2011 survey by the Association for Pet Obesity Prevention (APOP)[1]

A growing epidemic

- Over the last five years the incidence of overweight or obese dogs has increased by almost 40% in the US.[1]
- Over the same time period the number of overweight or obese cats has increased by an astonishing 90%.[1]
- In the US, 53% of dogs and 55% of cats are now overweight or obese.[2]

Real world challenges

For the veterinary healthcare team:

- Talking about weight with clients can be a difficult conversation
- Diagnosis and management of overweight and obese pets is complicated by the lack of a readily available, objective diagnostic test to confirm both the presence and extent of the disease
- Pet owners don't always follow feeding plans exactly

For pet owners:

- Lack of awareness that their pets are overweight or obese
- Guilt about "depriving" their pets when controlling portions or withholding treats
- Frustration with plans that haven't worked or have resulted in weight regain

weight management

Every pet. Every time.

It's time for a new approach

Nutrition is the single most important environmental influence on a pet's health and well-being. Just like checking temperature, pulse, respiration and pain, assessing nutrition is vital to optimal animal health, especially with overweight and obese pets.

You have the opportunity to address the obesity epidemic at its source. By incorporating a nutritional assessment and specific dietary recommendation in your physical exam for **every pet, every time**, you will be strengthening relationships with your clients and meeting the needs of your patients.

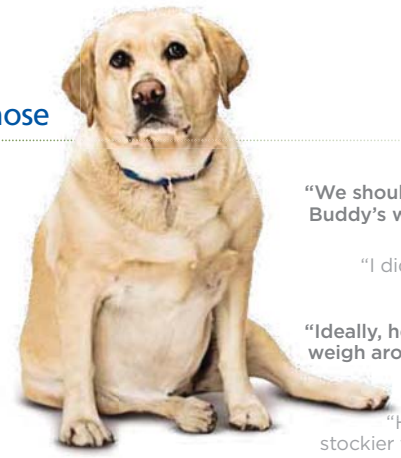
When it comes to your patients, you are the expert — the one voice clients listen to for answers they can trust. Weight management should be no different.

New tools for real results

Now, with the **Hill's Healthy Weight Protocol** and **Hill's® Prescription Diet® Metabolic Advanced Weight Solution**, you've got:

- A new, objective and clinically proven diagnostic tool to help you talk about weight and recommend a customized feeding plan
- Veterinary-exclusive, zero deprivation weight loss and maintenance nutrition that fits the way your clients feed their pets to ensure a healthy weight and a long life

A different way to diagnose



"We should talk about Buddy's weight ..."

"I didn't realize there was a problem."

"Ideally, he should weigh around ..."

"He's always been stockier than other Labs."

When words fail, numbers talk

INTRODUCING THE HILL'S HEALTHY WEIGHT PROTOCOL

The weight conversation is never easy, especially when current methods to diagnose weight problems are subjective and often dismissed by clients as opinion, overestimate ideal weight and lead to feeding plans that fail in more than 75% of pets.[3]

That's why we're pleased to introduce the new Hill's Healthy Weight Protocol, a breakthrough approach to diagnosing and managing weight problems developed from a multi-year study by the University of Tennessee School of Veterinary Medicine. It's a completely new, objective and clinically proven tool to help you to reinforce your recommendation with even your toughest clients:

- More accurately assess an overweight patient's ideal weight
- Engage pet owners with objective numbers they can understand
- Create a customized feeding plan based on the patient's ideal weight
- Provide tools to monitor progress and keep patients on track to successful weight loss

THE UNIVERSITY of TENNESSEE UT

weight management

What makes the Hill's Healthy Weight Protocol different?

- Addresses all levels of obesity; current body condition score (BCS) scales only address body fat percentage up to 45%
- Based on morphometric measurements that estimate percentage of body fat rather than the more subjective BCS
- Clinically proven to more accurately predict ideal body composition in overweight dogs and cats

IDEAL WEIGHT MATTERS

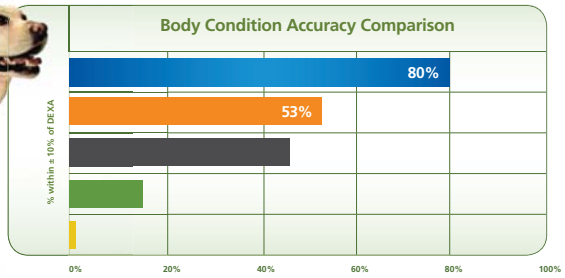
Small inaccuracies can make a big difference

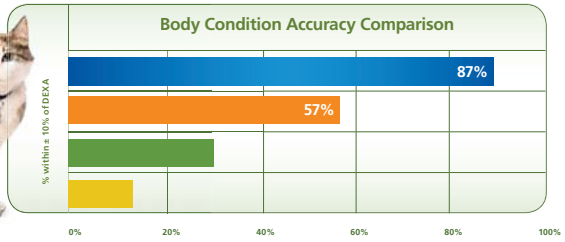
- Feeding recommendations based on an inaccurate estimate of ideal body weight result in overfeeding
- Overfeeding results in unsuccessful weight loss attempts and pet owner frustration
- In studies, when traditional BCS was used to estimate ideal body weight more than half of the pets received a recommendation to consume excess calories[4,5]

More accurate tools mean better weight loss success

Using the Hill's Healthy Weight Protocol, four simple morphometric body measurements in dogs and six in cats accurately predicted ideal body weight, within 10% of DEXA-determined values, in over 80% of patients. The Healthy Weight Protocol is intended for overweight and obese pets with 35% or higher body fat.

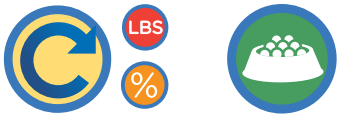
- The Hill's Healthy Weight Protocol Morphometric Measurements
- The Hill's Healthy Weight Protocol BFI Risk Chart
- BCS 9 (revised)
- BCS 9 (original)
- BCS 5





How the Hill's Healthy Weight Protocol works

With just two simple steps, the Hill's Healthy Weight Protocol gives you a new, objective and clinically proven diagnostic tool to help you talk about weight.



STEP 1

Weigh the patient and take a few easy measurements

STEP 2

Go to the Hill's Healthy Weight Protocol e-tool at **HWP.HillsVet.com*** to:

- Calculate ideal weight
- Receive customized feeding plans
- Access tools to monitor progress and keep patients on track
- Ensure a healthy weight for a lifetime

Get the conversation started today at HWP.HillsVet.com and find additional support including clinic resources and videos.

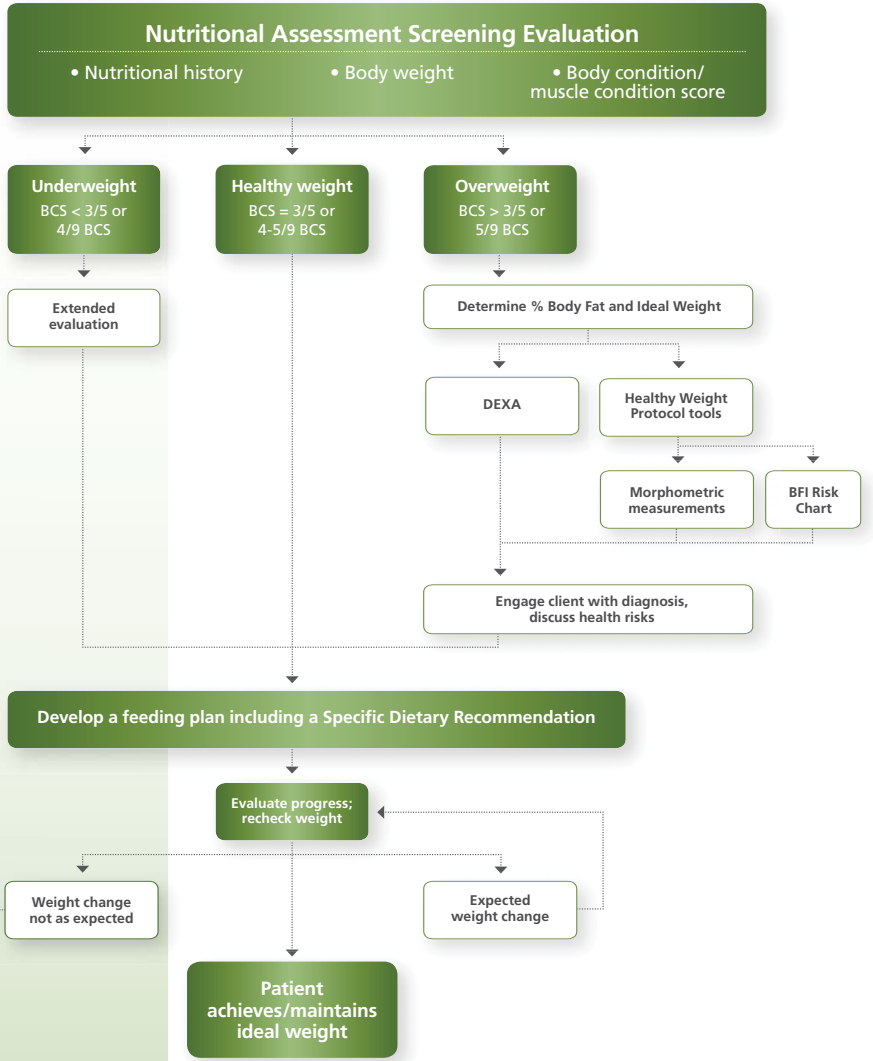
***Download** the Hill's Healthy Weight Protocol app

iOS

(available for Android™ and iOS®)

The Hill's Healthy Weight Protocol in practice

Incorporating the Hill's Healthy Weight Protocol into routine examinations



Canine Morphometric Measurements

Perform measurements using a tailor's tape. For measurements of circumference, wrap tape snugly.

1 Cranial length

Measure from the level of the medial canthus equidistant between the eyes to the external occipital protuberance.

[Brachynacephalic Canine]

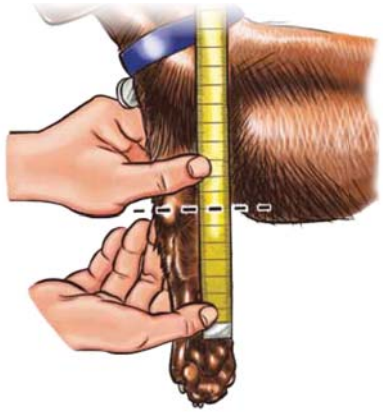
2 Head circumference

Measure circumference by placing tape equidistant between the eyes and ears at the widest part of the head.

[Brachynacephalic Canine]

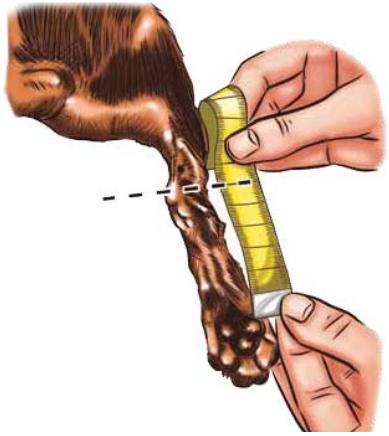
3 Front leg length

Measure from the proximal edge of the central foot pad to the point of the elbow (olecranon process). Carpus must be straight.



4 Hind leg length

Measure from the proximal edge of the central foot pad to the tip of the hock (dorsal tip of the calcaneal process). Tarsus must be straight.



weight management

Feline Morphometric Measurements

Perform measurements using a tailor's tape. For measurements of circumference, wrap tape snugly.

1 Head circumference

Measure circumference by placing the tape equidistant between the eyes and ears at the widest part of the head.

[Persian]

2 Thoracic circumference

Measure the girth at the level of the heart (~ 6th – 7th rib, just behind elbow)

3 Front leg circumference

Measure circumference at the midpoint between the carpus and the elbow.

4 Front leg length

Measure from the proximal edge of the central foot pad to the point of the elbow (olecranon process). Carpus must be straight.

5 Hind leg length

Measure from the proximal edge of the central foot pad to the tip of the hock (dorsal tip of the calcaneal process). Tarsus must be straight.

6 Body length

Starting from the base of the tail, measure along the dorsal midline following the contours of the back, neck and head to the proximal edge of the nose pad.

[Persian]

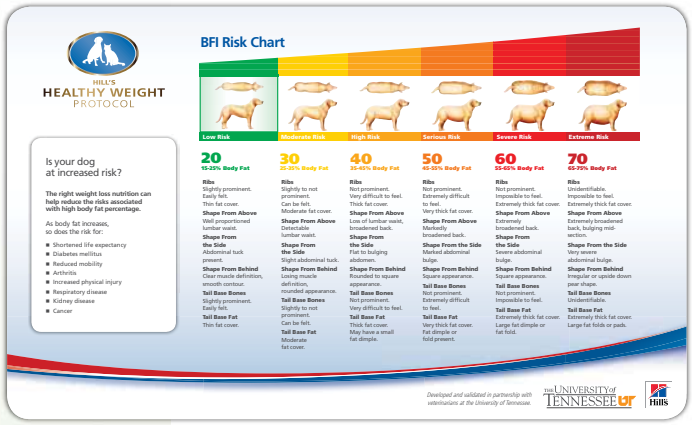
The Hill's Healthy Weight Protocol in practice (cont'd.)

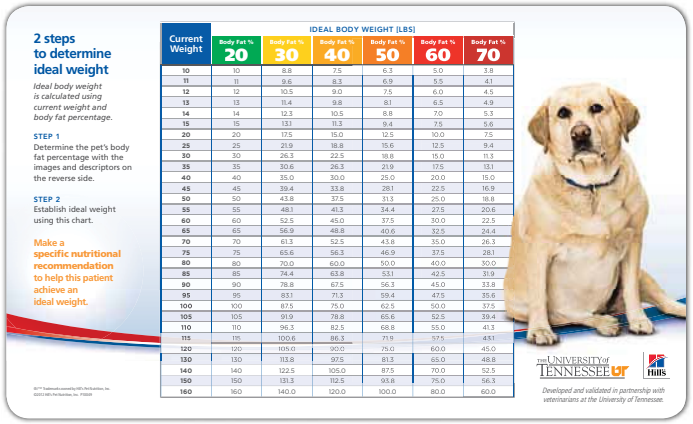
Assessing BFI and ideal weight with the Hill's Healthy Weight Protocol BFI Risk Charts

If your patient is uncomfortable with the morphometric measurements or you don't have access to the Healthy Weight Protocol e-tool, you can still assess ideal weight and body fat percentage using the Hill's Healthy Weight Protocol BFI Risk Chart.

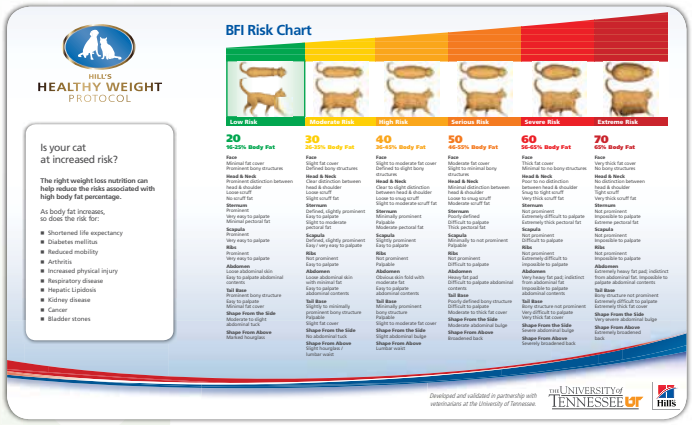
- Using the descriptors and images as a guide, evaluate the pet to determine BFI
- Share that diagnosis with the client and communicate the pet's risk level
- Flip the chart over to determine the pet's ideal weight

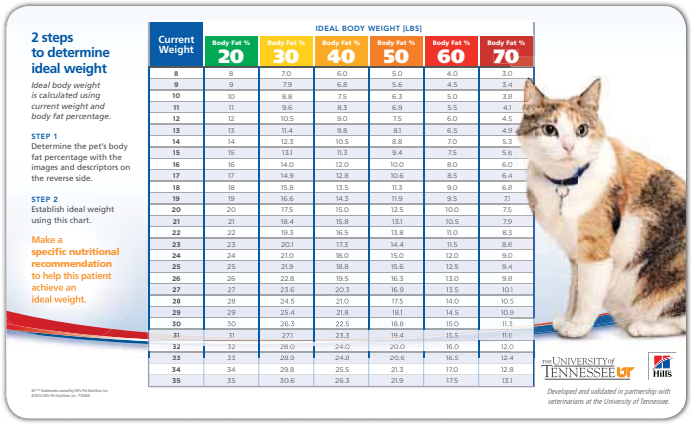
Canine





Feline





Introducing Hill's® Prescription Diet® Metabolic Advanced Weight Solution

Clinically proven to work with each pet's unique metabolic response activating the body's natural ability to burn excess body fat and affect calorie utilization[6]

Expect something different.

Real results in the real world.

All therapeutic foods work in clinical settings under strictly controlled conditions, but Metabolic Advanced Weight Solution is proven to work in real homes with real pets and their owners under real world conditions.

- Veterinarian-supervised, in-home, double-blinded feeding trial with 314 client-owned pets
- 96% of dogs and 81% of cats lost weight[6]
- Pets lost an average of 0.7% body weight per week over the two-month period[6]
- 80% of all clients would recommend Metabolic Advanced Weight Solution to their friends with overweight pets[6]

Zero deprivation weight loss

Metabolic Advanced Weight Solution includes a complete portfolio of dry food, canned food and treats designed to work together for easy, flexible weight loss success without deprivation making it much easier for pet owners to keep pets on the program and comply with your feeding recommendation.

Expect something different (cont'd)

Nutrition designed to affect energy metabolism

For years, Hill's has been exploring the most effective ways to affect energy metabolism through nutrition.

Now, we're targeting the biochemical pathways that are important to energy metabolism.

Hill's® Prescription Diet® Metabolic Advanced Weight Solution contains a synergistic blend of nutrients and ingredients that works to change multiple pathways for more efficient energy metabolism.

Hill's® Prescription Diet® m/d® Feline takes advantage of cats' natural ability to use protein as an energy source by providing nutrition with high protein/low carbohydrate ratio.

Hill's® Prescription Diet® r/d® targets selected pathways to increase energy metabolism through its unique fiber blend and lysine/calorie ratio.

Hill's® Prescription Diet® w/d® uses a high fiber/low calorie method to help maintain ideal body weight after achieving weight loss.

No other nutrition works like this

Hill's® Prescription Diet® Metabolic Advanced Weight Solution activates metabolism to regulate appetite and burn fat — reducing the need for pet owners to precisely measure daily portions to safely achieve and maintain a healthy weight.

Inefficient energy metabolism

For pets with an inefficient energy metabolism profile, simply restricting calories will not overpower the evolutionary drive to prevent loss of body fat.

Because the brain can't tell the difference between deliberate calorie reduction and starvation, it defends its fat stores by decreasing the metabolic rate and increasing efficiency of energy use.[7]

Turning up metabolism

While eating Metabolic Advanced Weight Solution, an obese animal's metabolism changes to act more like that of a lean animal.

Highly efficient energy metabolism

Even after weight loss is achieved, the highly efficient energy metabolism profile is maintained, avoiding weight regain as long as the animal continues to eat the food.

Nutritional solutions

Weight loss and maintenance through metabolic change

Hill's® Prescription Diet® Canine Metabolic Advanced Weight Solution

Improves metabolism for weight loss and maintenance

- **Real world success:** 88% of pets lost weight in two months at home[6]
- **Real world efficacy:** Clinically proven nutrition to safely reduce body fat by 28% in just two months[6]
- **Fits the way clients feed:** Complete portfolio of dry food, canned food, and treats to ensure safe and healthy weight loss and easy weight maintenance
- Clinically proven to avoid weight regain following a weight loss program[6]
- Contains effective levels of L-carnitine to convert fat into energy and build lean muscle mass[6]
- Clinically proven to spare lean body mass during weight loss and weight management[6]

Weight loss through high fiber, low calorie

Hill's® Prescription Diet® r/d® Weight Loss- Low Calorie

Weight loss

- Clinically proven nutrition to safely reduce body fat by 22% in just two months[8]
- High total dietary fiber to help dogs feel fuller between meals
- Added lysine to help maintain lean body mass
- Effective carnitine levels to help convert fat into energy and build lean muscle mass

Additional indications

- Hyperlipidemia
- Fiber-responsive disease

Weight maintenance through high fiber, moderate calorie

Hill's® Prescription Diet® w/d® Low Fat-Glucose Management-Gastrointestinal

Weight maintenance and obesity prevention

- Clinically proven to help dogs maintain a healthy weight[8,9]
- Unique blend of soluble and insoluble fiber to support a feeling of fullness and support gastrointestinal health
- Effective carnitine levels to help convert fat into energy and build lean muscle mass

Additional indications

- Fiber-responsive disease
- Diabetes mellitus
- Struvite urolithiasis

Low calorie weight control

Hill's® Science Diet® Adult Light Canine

Weight control for less active or neutered dogs

- Reduced calories to help maintain a healthy weight
- High quality protein maintains lean muscle and ideal body weight
- Nourishing fatty acids for healthy skin and shiny coat and support of the nervous and immune systems

Nutritional solutions

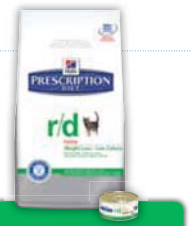
Weight loss and maintenance through metabolic change

Hill's® Prescription Diet® Feline Metabolic Advanced Weight Solution

Improves metabolism for weight loss and maintenance

- **Real world success:** 88% of pets lost weight in two months at home[6]
- **Real world efficacy:** Clinically proven nutrition to safely reduce body fat by 29% in just two months[6]
- **Fits the way clients feed:** Complete portfolio of dry food, canned food, and treats to ensure safe and healthy weight loss and easy weight maintenance
- Advanced weight management for multi-cat households
- Clinically proven to spare lean body mass during weight loss[5]
- Clinically proven to avoid weight regain following a weight loss program[6]
- Contains effective levels of L-carnitine to convert fat into energy and build lean muscle mass[6]

Weight loss through high fiber, low calorie



Hill's® Prescription Diet® r/d® Weight Loss-Low Calorie

Weight loss

- Clinically proven nutrition to safely reduce body fat by 20% in just three months[10]
- High total dietary fiber to help cats feel fuller between meals
- High carnitine levels to help cats burn fat while maintaining lean muscle mass

Additional indications

- Struvite feline lower urinary tract disease (FLUTD)
- Hyperlipidemia
- Fiber-responsive disease

Weight loss and maintenance through high protein, low carbohydrate

Hill's® Prescription Diet® m/d® Weight Loss-Low Carbohydrate-Glucose Management

Weight loss and maintenance

- Low carbohydrate, high protein nutrition clinically proven to work with a cat's metabolism and reduce body fat
- High levels of carnitine to help mobilize body fat and maintain lean body mass

Additional indications

- Diabetes mellitus

Weight maintenance through high fiber, moderate calorie

Hill's® Prescription Diet® w/d® Low Fat-Glucose Management-Gastrointestinal

Weight maintenance and obesity prevention

- Low levels of fat and calories
- Unique blend of soluble and insoluble fiber to support a feeling of fullness and support gastrointestinal health

Additional indications

- Fiber-responsive disease
- Feline lower urinary tract disease (FLUTD)
- Gastrointestinal disorders

Low calorie weight control

Hill's® Science Diet® Adult Light Feline

Weight control for less active or spayed cats

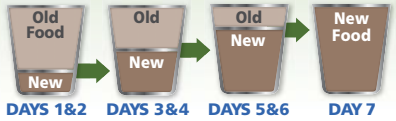
- Reduced calories to help maintain a healthy weight
- High fiber helps control hunger between meals
- L-carnitine (dry formula) for lean muscle and ideal body weight

Answering pet owner questions

Answering pet owner questions about Hill's® Prescription Diet® Metabolic Advanced Weight Solution

Transitioning to a new food

Gradually mix increasing amounts of the new food with decreasing amounts of the old food over a 7-day period



Question ***How long will it take for my pet to reach his ideal weight?***

Answer Using the Hill's Healthy Weight Protocol, we can design a customized feeding plan just for your pet. Typical results are 0.5 – 1% body weight loss per week.

Question ***How long does my pet need to eat Metabolic Advanced Weight Solution?***

Answer To maintain a healthy weight, your pet should remain on Metabolic Advanced Weight Solution for life.

Question ***Is it okay to feed my pet canned food and treats along with this food?***

Answer Metabolic Advanced Weight Solution is also available in canned form, as well as treats. In order to maintain the changes in metabolism this food provides, you should feed Metabolic Advanced Weight Solution canned and treats. We will need to adjust the amount of dry food offered if you plan to also offer canned and treats.

Question ***Other weight loss products have caused an increase in my pet's stool volume. Should I expect the same with Metabolic Advanced Weight Solution?***

Answer While the fiber sources are very different, the total dietary fiber content is similar to Hill's® Prescription Diet® r/d® Weight Loss-Low Calorie, so we should expect that the stool volume would be about the same or less as on r/d.

Question ***I have multiple cats in my household. Do I need to separate my overweight cat from the others when feeding?***

Answer Metabolic Advanced Weight Solution is safe to feed in multiple cat households. This food is not recommended for kittens.

Hill's Evidence Based Clinical Nutrition™

Effectiveness of Hill's® Prescription Diet® Metabolic Advanced Weight Solution for Weight Loss in Client Owned Pets

Key points:

- **Hill's® Prescription Diet® Metabolic Advanced Weight Solution** works the way people feed their pets, 96% of dogs and 81% of cats lost weight in two months[6]
- In typical households, under normal management conditions, dogs lost weight at a rate of 0.8% of body weight per week and cats lost weight at a rate of 0.5% per week[6]
- Owners agreed that **Metabolic Advanced Weight Solution** is an easy way for pets to lose weight, keeps their pet full and satisfied, and the majority would recommend it to a friend with an overweight pet[6]

Purpose:

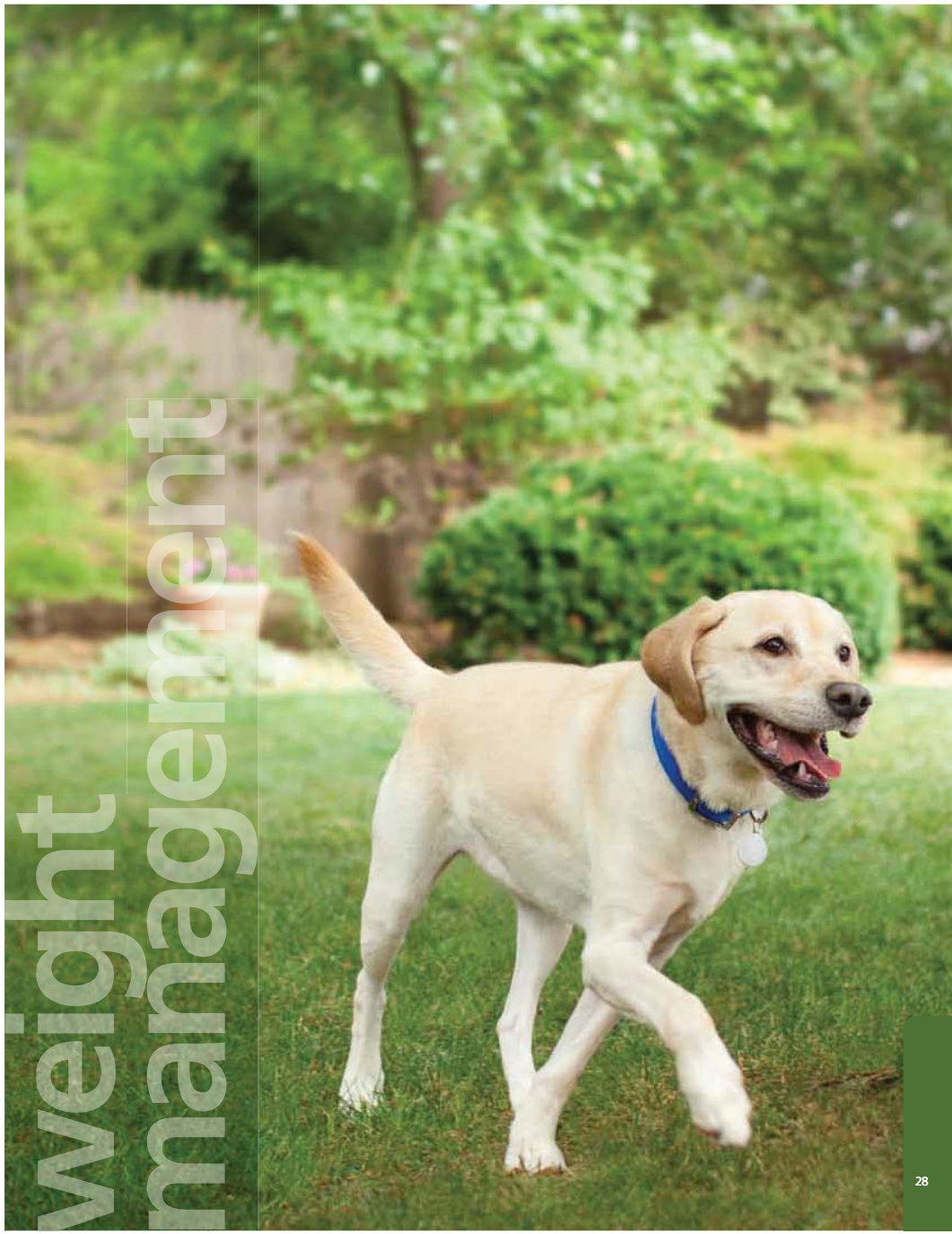
The objective of this study was to determine the effectiveness of **Metabolic Advanced Weight Solution** to achieve weight loss in dogs and cats under normal usage conditions in pet owner homes and to understand owner reaction to the usage experience.

Design:

Pets determined to have ≥ 29% body fat based on morphometric measurements were enrolled in a two-month study. Although feeding recommendations were made for weight loss (0.8 x RER for cats, 1.0 x RER for dogs for ideal weight), owners were not informed that they were enrolling their pet in a weight loss study. Owners were provided sufficient test food for the primary (enrolled) pet and up to three additional pets of the same species for the duration of the study period. This was a blinded study in that the pet food manufacturer and sponsor of the study was not revealed to participating veterinary clinics or pet owners, and the product was provided in non-branded bags.

Results:

159 dogs representing 58 breeds (5.5 – 249 lbs.) and 155 cats representing 8 breeds (9.5 – 27 lbs.) completed the study. At the end of the study, 96% dogs and 81% cats lost weight. The average rate of weight loss was 0.8% and 0.5% per week of initial body weight for dogs and cats, respectively. Based on owner responses to surveys, 68% of pet owners agreed this was an easy way for their pet to lose weight, 65% agreed the food kept their pet feeling full and satisfied. Overall, 80% of pet owners would recommend **Metabolic Advanced Weight Solution** to a friend with an overweight pet.



Morphometric Measurements Accurately Predict Body Composition

Key points:

- Clinically proven method to accurately predict ideal body composition in overweight dogs across a wide range of breeds
- Four simple measurements predict percent body fat within 10% of DEXA value in 80% of patients
- Traditional 5-point Body Condition Scoring systems are only accurate at predicting body composition in dogs 15.7% of the time
- Accurately determining an overweight pet's ideal weight creates more accurate feeding plans and greater success at getting pets to a healthy weight

Purpose:

The purpose of this study was to validate a new clinical method of measuring body composition in dogs.

Design:

83 overweight client-owned dogs ranging from 11 – 162 lbs. and representing 27 breeds as well as mixed breeds were evaluated by DEXA, BCS, morphometric measurements and BFI Risk Chart.

Results:

Using the body condition scores assigned during the physical exam to estimate percent body fat was not highly effective. The BCS-5 scores provided an estimate of percent body fat within ±10% of the DEXA value for only 13% of the subjects and within ±20% for only 40%.

Using the originally published %BF values for BCS-9 scale demonstrated very poor performance.[11] Only 2% of the population was predicted to the ±10% level and 19% at the ±20% level. Using the published revision of the BCS-9 scale led to better performance, 47% of the population was predicted to the ±10% level and 75% at the ±20% level.[12]

The BFI Risk Chart performed much better than the BCS methods, predicting 53% and 91% of the population to ±10% and ±20%, respectively of the DEXA value for percent body fat.

Morphometric measurements were highly effective at predicting percent body fat. This method predicted percent body fat within ±10% of the DEXA value 80% of the time and within ±20% of the DEXA value 98% of the time.

Key points:

- Clinically proven to more accurately predict ideal body composition in overweight cats
- Six simple measurements predict percent body fat within 10% of DEXA value in 87% of patients
- Traditional 5-point Body Condition Scoring systems are only accurate at predicting body composition in felines 12.5% of the time
- Accurately determining an overweight pet's ideal weight creates more accurate feeding plans and greater success at getting pets to a healthy weight

Purpose:

The purpose of this study was to validate a new clinical method of measuring body composition in cats.

Design:

76 overweight client-owned cats ranging from 6.2 – 25.3 lbs. and representing 8 breeds as well as mixed breeds were evaluated by DEXA, BCS, morphometric measurements and BFI Risk Chart.

Results:

The traditional 5-point Body Condition Scoring (BCS-5) system was not effective for predicting percent body fat for most of this population. Using the BCS-5 values assigned during the physical exam provided an estimate of percent body fat within ±10% of the DEXA value for only 13% of the subjects and within ±20% for only 39%.

The 9-point BCS system (BCS-9) was somewhat better, but still not very effective. This method estimated percent body fat to within ±10% of the DEXA value for only 31% of the subjects and to within ±20% for 67%.

The BFI Risk Chart performed much better than BCS. The BFI Chart predicted 57% and 91% of the population to ±10% and ±20% respectively of the DEXA value for percent body fat.

Morphometric measurements were highly effective for predicting body composition as evaluated as the percent of the population predicted within ±10% of the DEXA value. This method accurately predicted body fat in >85% of the population to ±10% of the DEXA value and 100% to the ±20% level.

Conclusion for both canine and feline studies:

Traditional methods of body condition scoring provide inaccurate estimations of ideal weight. Failure to accurately diagnose ideal weight will result in overestimation of the calories required for weight loss. As a result, pets will be "set up" to fail from the start of the weight loss program.

Hill's Evidence Based Clinical Nutrition™

Hill's® Prescription Diet® Metabolic Advanced Weight Solution Weight Loss and Weight Maintenance Study

Key points:

- **Canine Metabolic Advanced Weight Solution** has clinically proven nutrition to safely and naturally support weight loss and maintenance
- **Canine Metabolic Advanced Weight Solution** has clinically proven nutrition to spare lean body mass during weight loss and weight maintenance[6]
- **Canine Metabolic Advanced Weight Solution** has clinically proven nutrition to safely provide 28% body fat loss in two months in dogs[6]

Purpose:

These studies were designed to evaluate the efficacy of **Canine Metabolic Advanced Weight Solution** to help overweight and obese dogs achieve and maintain a healthy weight.

Design:

Two groups of 10 dogs with > 33.1% body fat (DEXA) completed a weight loss and weight maintenance study. Dogs were fed for weight loss for four months, or until ideal body weight was reached. Then, all dogs were fed to maintain their weight for four months. Dogs underwent DEXA and serum chemistry analysis at months 0, 1, 2, 3 and 4 of weight loss and weight maintenance.

Results:

Dogs lost an average of 11.8% and 12.6% of body weight (BW) and 29.9% and 27.5% body fat (BF) in eight weeks. These values were significant for both groups (P<0.01) On average the dogs lost weight at a rate of 1.5% and 1.4% of their BW per week. This is within the safe rate of weight loss of 1-2%/week. There was no statistical difference in BW at the end of weight loss and the end of weight maintenance for either group. At the end of weight maintenance, dogs on average were consuming food at 2.4 X RER, well above the recommended 1.4 X RER for weight maintenance in obese prone dogs. Dogs with less than ± 5 % change in BW at the end of weight maintenance (9/20) maintained BW while continuing to lose body fat (average -946 gm BF) and gained lean body mass (average + 676 gm LBM).

Key points:

- **Feline Metabolic Advanced Weight Solution** has clinically proven nutrition to safely and naturally support weight loss and maintenance
- **Feline Metabolic Advanced Weight Solution** has clinically proven nutrition to spare lean body mass during weight loss and weight maintenance[6]
- **Feline Metabolic Advanced Weight Solution** has clinically proven nutrition to safely provide 29% body fat loss in two months in cats[6]

Purpose:

These studies were designed to evaluate the efficacy of **Feline Metabolic Advanced Weight Solution** to help overweight and obese cats achieve and maintain a healthy weight.

Design:

Two groups of 10 cats with > 30% body fat (DEXA) completed a weight loss and weight maintenance study. Cats were fed for weight loss for four months, or until ideal body weight was reached, then all cats were fed to maintain their weight for four months. Cats underwent DEXA and serum chemistry analysis at months 0, 1, 2, 3 and 4 of weight loss and weight maintenance.

Results:

Cats lost an average of 14.2% and 15.0% of body weight (BW) and 30.1% and 29.1% body fat (BF) in eight weeks. These values were significant for both groups (P<0.01). On average, the cats lost weight at a rate of 1.2% and 1.3% of their BW per week. This is within the safe rate of weight loss of 1-2%/week. There was no statistical difference in BW at the end of weight loss and the end of weight maintenance for either group. At the end of weight maintenance, cats on average were consuming food at 1.3 X RER, well above the recommended 1.0 X RER for weight maintenance in obese prone cats. Cats with less than ± 5 % change in BW at the end of weight maintenance (6/19) maintained BW while continuing to lose body fat (average -252 gm BF) and gained lean body mass (average + 240 gm LBM).

Changes in Gene Expression After Weight Loss and Weight Maintenance in Overweight Cats and Dogs Fed Hill's® Prescription Diet® Metabolic Advanced Weight Solution

Key points:

- Changes in gene expression can reflect the changes in underlying biochemistry
- Feeding **Feline Metabolic Advanced Weight Solution** helps the cats achieve a healthy gene expression profile
- The magnitude of biochemical changes resulting from feeding **Feline Metabolic Advanced Weight Solution** are maximized at the end of weight loss, but are consistent during weight maintenance

Purpose:

This study was designed to evaluate the effects of **Feline Metabolic Advanced Weight Solution** on changes in biochemistry as reflected by changes in gene expression in overweight and obese cats during weight loss and weight maintenance.

Design:

Twenty cats participating in the **Feline Metabolic Advanced Weight Solution Weight Loss and Weight Maintenance Study** were evaluated for gene expression changes at the end of weight loss (Day 112 or when ideal weight reached) and at the end of a 4-month weight maintenance phase (Day 224). Whole blood samples were evaluated by GeneChip and data analyzed by the Partek® GS for Gene Expression Data software. The Robust Multichip Average (RMA) algorithm was used for normalization and probe-level summarization of raw data. ANOVA was performed to find significantly differentially expressed genes between any two groups with a minimal False Discovery Rate (FDR) threshold of 0.1. A fold change cut-off of 1.25 was selected.

Results:

When gene expression at Day 112 and Day 224 was compared to Day 0, there were 424 and 1391 significant gene expression changes, respectively (Figure 1). While the number of differentially expressed genes increased during weight maintenance, the magnitude of gene expression change was greatest at Day 112. In addition to reducing weight and lowering the percentage fat in the body, **Feline Metabolic Advanced Weight Solution** works naturally to promote healthy gene expression changes. This is exemplified by the lowering of the expression of key metabolic genes such as Phosphatidylcholine Transfer Protein (PCTP).

Figure 1: Heat map reflecting significant changes in gene expression in cats fed **Feline Metabolic Advanced Weight Solution** for 112 and 224 days compared to baseline.
Each column = an individual cat at Day 0, 112 or 224
Each row = an individual gene with significant change in expression over time
Genes with relative down regulation/expression are shown in blue; genes with relative up regulation/expression are shown in red.

Key points:

- Changes in gene expression can reflect the changes in underlying biochemistry
- Feeding **Canine Metabolic Advanced Weight Solution** helps the dogs achieve a healthy gene expression profile
- Biochemical changes resulting from feeding **Canine Metabolic Advanced Weight Solution** are maximized at the end of weight loss, but are consistent during weight maintenance

Purpose:

This study was designed to evaluate the effects of **Canine Metabolic Advanced Weight Solution** on changes in biochemistry as reflected by changes in gene expression in overweight and obese dogs during weight loss and weight maintenance.

Design:

Twenty dogs participating in the **Hill's® Prescription Diet® Canine Metabolic Advanced Weight Solution Weight Loss and Weight Maintenance Study** were evaluated for gene expression changes at the end of weight loss (Day 112 or when ideal weight reached) and at the end of a 4 month weight maintenance phase (Day 224). Whole blood samples were evaluated by GeneChip and data analyzed by the Partek® GS for Gene Expression Data software. The Robust Multichip Average (RMA) algorithm was used for normalization and probe-level summarization of raw data. ANOVA was performed to find significantly differentially expressed genes between any two groups with a minimal False Discovery Rate (FDR) threshold of 0.1. A fold change cut-off of 1.25 was selected.

Results:

When gene expression at Day 112 and Day 224 was compared to Day 0, there were 74 and 307 significant gene expression changes, respectively (Figure 2). While the number of differentially expressed genes increased during weight maintenance, the magnitude of gene expression change was greatest at Day 112. In addition to reducing weight and lowering the percentage fat in the body, **Canine Metabolic Advanced Weight Solution** works naturally to promote healthy gene expression changes. This is exemplified by the lowering of the expression of key metabolic genes such as the TSHB, PCTP and CA1.

Figure 2: Heat map reflecting significant changes in gene expression in dogs fed **Canine Metabolic Advanced Weight Solution** for 112 and 224 days compared to baseline.
Each column = an individual dog at Day 0, 112 or 224
Each row = an individual gene with significant change in expression over time
Genes with relative down regulation/expression are shown in blue; genes with relative up regulation/expression are shown in red.

Appendix

Frequently asked questions about the Hill's Healthy Weight Protocol

Question

Why does my clinic need this protocol?

Answer

Recent studies have shown that using currently available methods, 75% of feeding plans developed for weight loss were inaccurate. These plans led to overfeeding the pets with too many calories and as a result, not achieving weight loss — or worse — gaining weight. We need a more effective way to determine a pet's ideal weight and with that create more effective weight loss feeding plans.

Question

Why should I be feeding to the pet's ideal weight?

Answer

Simply put, excess fat tissue does not increase a pet's calorie need. So feeding to an overweight pet based on their current weight leads to consumption of excess calories. We need to feed to their ideal weight to ensure they get the right amount of calories.

Question

What is the Hill's Healthy Weight Protocol e-tool?

Answer

The Hill's Healthy Weight Protocol e-tool is an objective, quantitative evaluation. This diagnostic approach utilizes a series of body frame (morphometric) measurements to determine the pet's ideal weight. There are four simple measurements for dogs and six measurements for cats. The measurements take about 2 minutes to complete and only need to be done once to establish the pet's ideal weight for life.

Question

When should I use the Hill's Healthy Weight Protocol BFI Risk Chart to assess an overweight patient?

Answer

In those cases in which a pet cannot be measured using the Healthy Weight Protocol morphometric measurements or when the clinic lacks access to the Healthy Weight Protocol's e-tool for ideal weight calculations.

Question

Can I use the Healthy Weight Protocol morphometric measurements on all pets?

Answer

No. Although all pets should be evaluated by BCS/MCS during the nutritional screening evaluation, this diagnostic approach is only useful in patients considered to have abnormal body conditions based on currently available methods of assessment (BCS > 3/5 or 5/9).

Question

Should the Hill's Healthy Weight Protocol be used on animals of all ages?

Answer

No. The Healthy Weight Protocol e-tool and BFI Risk Chart are designed for otherwise healthy adult pets over the age of 1. They are not intended for use in puppies, kittens, pregnant or lactating females, or geriatric animals that are likely losing lean muscle mass.

Question

The ideal weight seems low to me.

Answer

The Hill's Healthy Weight Protocol e-tool and morphometric measurements are not 100% accurate therefore the reported ideal weight may be low in some cases. Based on validations studies, morphometric measurements overestimate ideal body fat (and therefore the calculations would predict a slightly lower ideal weight than DEXA would predict) in 15% of dogs and 8% of cats. The Hill's Healthy Weight Protocol is a diagnostic method, and therefore only a starting point for a feeding recommendation. The Hill's Healthy Weight Protocol is not a substitute for professional assessment and ultimate recommendation. If the pet is losing weight too quickly or seems excessively hungry, the ideal weight can be adjusted in the Hill's Healthy Weight Protocol e-tool (corresponding feeding plan will then adjust).

weight management

Frequently asked questions about Hill's® Prescription Diet® Metabolic Advanced Weight Solution

Question

How do you know that the pet will not regain weight once ideal weight is achieved?

Answer

As long as the patient remains on Metabolic Advanced Weight Solution, and is fed appropriately, our clinical evidence indicates that the patient will not regain the weight that was lost.[6]

Question

Is the reason that pets lost weight because the food is not palatable?

Answer

Metabolic Advanced Weight Solution was developed to be highly palatable for both dogs and cats. The pets lost weight because of the efficacy of the product.

Question

What are the recommended feeding guidelines after ideal weight is achieved?

Answer

There are two feeding guides, one for weight loss and one for weight maintenance. Feeding amounts should be adjusted based on the individual pet's needs. Once the pet achieves ideal weight, it may be necessary to increase the amount of food in order to maintain that body weight. We recommend you schedule regular weight checkups to monitor weight loss and reassess the feeding plan as needed.

Question

What is the recommended follow up protocol when I place a patient on this food?

Answer

We recommend a follow up phone call after three days to ensure the transition is going well. Pets should be weighed monthly until ideal weight is achieved. After ideal weight is achieved, the pet should remain on monthly weight checks for 2–3 months or until a maintenance feeding schedule that will maintain the pet at the ideal weight has been determined.

Canine Metabolic Advanced Weight Solution nutritional information

Metabolic Advanced Weight Solution

Prescription Diet® Canine Metabolic Advanced Weight Solution

Obesity

Metabolic Advanced Weight Solution: Cans of 13 oz (1957) in cases of 12

Metabolic Advanced Weight Solution: Bags of 6 lbs (1951), 17.6 lbs (1952) and 27.5 lbs (1953)

Metabolic Advanced Weight Solution Treats: Bags of 16 oz (1959) in cases of 6

Indications

Overweight, obesity.

Not recommended for

Growing puppies, pregnant or nursing dogs.

Evidence-Based Clinical Nutrition

- In an in-home feeding study 96% of dogs experienced weight loss within 2 months.[1]
- Clinically proven to avoid weight regain following a weight loss program.[1]
- Clinically proven to safely provide 28% body fat loss in 2 months in dogs.[1]
- The nutrition of Metabolic is clinically proven to work with each dog's unique metabolic response activating the body's natural ability to burn excess body fat and affect calorie utilization.[1]
- 86% of clients/dog owners would recommend the Metabolic formula to their friends with overweight dogs.[1]

Additional information

- Maintains effective and safe rate of up to 1-2% body weight loss weekly during weight loss period.[1]
- **Prescription Diet® Canine Metabolic Advanced Weight Solution Treats** are designed to complement the nutrition found in **Prescription Diet® Canine Metabolic Advanced Weight Solution** pet food. They are also great with **Prescription Diet® j/d® Canine, r/d® Canine** or **w/d® Canine.**
- These treats contain a blend of ingredients that safely improve metabolism in dogs.
- To ensure maximum effectiveness of the **Prescription Diet® Canine Metabolic Advanced Weight Solution** brand dog food, limit **Treats** to 10% or less of the dog's daily energy intake. **Note:** This product may not be appropriate for animals with difficulty maintaining a specific urine pH. Monitoring urine pH and urinalysis is recommended.
- **Prescription Diet® Canine Metabolic Advanced Weight Solution Treats** are intended for intermittent or supplemental feeding only.

Other products to consider

Prescription Diet® r/d® Canine to reach the target body weight. A dog should then be fed **Prescription Diet® w/d® Canine** or **Science Diet® Adult Light Canine** to maintain optimum body weight and avoid weight gain.

These characteristics make **Prescription Diet® Canine Metabolic Advanced Weight Solution** veterinary exclusive pet food useful as a nutritional aid for improving energy metabolism in obese or overweight pets:

KEY BENEFITS

Propietary bundle of synergistically effective nutrients	High	Provides appetite regulation, reduces inflammation and improves energy metabolism.
Fiber	High	Soluble and insoluble fiber to trigger satiety, control appetite, and maintain gastrointestinal health.
Carnitine	High	Helps dogs burn fat while sparing lean muscle mass, resulting in more effective weight loss.
Lysine	High	Helps metabolize fat for energy production and maintain lean body mass.
Antioxidants	Added	Defend cells from free radical oxidation, promoting a healthy immune system.

[1] Data on file, Hill's Pet Nutrition, Inc.

Canine Metabolic Advanced Weight Solution nutritional information

Metabolic Advanced Weight Solution

DAILY FEEDING AMOUNTS

Animal feeding tests using AAFCO procedures substantiate that **Prescription Diet® Canine Metabolic Advanced Weight Solution** provides complete and balanced nutrition for maintenance of adult dogs. **The following amounts are a starting point only and should be adjusted as needed to maintain or reach the desired weight**. When feeding food for the first time, mix increasing amounts of the pet's new food with decreasing amounts of the old food over a 7-day period. Veterinary supervised exercise may be beneficial in combination with weight loss programs. Supplementation beyond the analogous canned or dry formulas or treats is unnecessary and may decrease the effectiveness of the food. **FOR WEIGHT LOSS:** Determine the amount to feed based on the target weight rather than the current weight. **FOR WEIGHT MAINTENANCE:** Patient should be monitored to ensure proper body weight is maintained. Increase food amounts accordingly.

Ideal Body Weight (lb)	FOR WEIGHT LOSS Can(s) (13 oz)	Dry – Cups	Treats	FOR WEIGHT MAINTENANCE Can(s) (13 oz)	Dry – Cups	Treats
5	⅜	½	0	⅝	⅞	1
10	⅔	⅞	1	1	1 ⅜	1
15	1	1 ⅛	1	1 ½	1 ⅞	1
20	1 ¼	1 ½	1	1 ¾	2 ⅓	2
30	1 ½	2	1	2 ½	3 ¼	2
40	2	2 ½	2	3	4	3
50	2 ¼	3	2	3 ½	4 ⅔	3
60	2 ½	3 ⅓	2	4	5 ⅓	4
70	3	3 ¾	3	4 ⅔	6	4
80	3 ¼	4	3	5	6 ½	4
100	3 ¾	4 ¾	3	6	7 ¾	5

INGREDIENTS CANNED

Canine Metabolic Advanced Weight Solution: Water, Pork Liver, Whole Grain Corn, Egg White, Chicken, Powdered Cellulose, Rice, Pork by-Product, Tomato Pomace, Flaxseed, Coconut Oil, Calcium Carbonate, DL-Methionine, Potassium Chloride, Carrot Powder, Lipoic Acid, Sodium Tripolyphosphate, L-Leucine, Iodized Salt, vitamins (Vitamin E Supplement, Ascorbic Acid (source of vitamin C), Thiamine Mononitrate, Niacin Supplement, Pyridoxine Hydrochloride, Calcium Pantothenate, Vitamin B12 Supplement, Riboflavin Supplement, Biotin, Vitamin D3 Supplement, Folic Acid), minerals (Manganese Sulfate, Zinc Oxide, Ferrous Sulfate, Copper Sulfate, Manganous Oxide, Calcium Iodate, Sodium Selenite), Taurine, L-Carnitine, Beta-Carotene.

AVERAGE NUTRIENT CONTENTS

	As Fed[1]	Dry Matter[2]	As Fed, Caloric Basis[3]
Protein	7.2 %	28.1 %	8.4 g
Fat	3.4 %	13.3 %	3.9 g
Carbohydrate (NFE)	9.6 %	37.5 %	11.1 g
Crude Fiber	4.0 %	15.6 %	4.6 g
Calcium	0.20 %	0.78 %	232 mg
Phosphorus	0.15 %	0.6 %	174 mg
Sodium	0.10 %	0.39 %	116 mg
Potassium	0.21 %	0.82 %	244 mg
Magnesium	0.024 %	0.094 %	28 mg
Carnitine	90 mg/kg (ppm)	352 mg/kg (ppm)	10.5 mg
Vitamin E	145 IU/kg	566 IU/kg	17 IU/100 kcal
Vitamin C	31 mg/kg	121 mg/kg	3.6 mg
METABOLIZABLE ENERGY			
kcal/kg	861	3,363	
kcal/can 13oz	319		
% Calories from:	Protein 29	Fat 33	Carbohydrates 38

[1]Differs from label guarantees which are either maximums or minimums. [2]The nutrient in the product after moisture is removed. It is used to make direct comparisons of nutrient profiles with differing moisture contents. [3]Nutrient intake for every 100 kilocalories consumed.

Appendix

Canine Metabolic Advanced Weight Solution nutritional information

Metabolic Advanced Weight Solution

Prescription Diet® Canine Metabolic Advanced Weight Solution

INGREDIENTS — DRY

Canine Metabolic Advanced Weight Solution: Chicken By-Product Meal, Whole Grain Wheat, Whole Grain Corn, Corn Gluten Meal, Pea Bran Meal, Soybean Mill Run, Soybean Meal, Dried Tomato Pomace, Chicken Liver Flavor, Dried Beet Pulp, Flaxseed, Coconut Oil, Lactic Acid, Powdered Cellulose, Pork Fat (preserved with Mixed Tocopherols and Citric Acid), Pork Liver Flavor, DL-Methionine, L-Lysine, Iodized Salt, Dried Carrots, Dicalcium Phosphate, Potassium Chloride, Lipoic Acid, vitamins (L-Ascorbyl-2-Polyphosphate (source of vitamin C), Vitamin E Supplement, Niacin, Thiamine Mononitrate, Vitamin A Supplement, Calcium Pantothenate, Biotin, Vitamin B12 Supplement, Pyridoxine Hydrochloride, Riboflavin Supplement, Folic Acid, Vitamin D3 Supplement), Choline Chloride, Vitamin E Supplement, minerals (Manganese Sulfate, Ferrous Sulfate, Zinc Oxide, Copper Sulfate, Calcium Iodate, Sodium Selenite), Taurine, L-Carnitine, Mixed Tocopherols added to retain freshness, Citric Acid added to retain freshness, Beta-Carotene, Phosphoric Acid, Rosemary Extract.

AVERAGE NUTRIENT CONTENTS

	As Fed[1]		Dry Matter[2]		As Fed, Caloric Basis[3]	
Protein	27.7	%	30.1	%	8.9	g
Fat	9.9	%	10.8	%	3.2	g
Carbohydrate (NFE)	36.0	%	39.1	%	11.6	g
Crude Fiber	12.6	%	13.7	%	4.1	g
Total Dietary Fiber	26.3	%	28.6	%	8.5	g
Calcium	0.73	%	0.79	%	236	mg
Phosphorus	0.61	%	0.7	%	197	mg
Sodium	0.34	%	0.37	%	110	mg
Potassium	0.90	%	0.98	%	291	mg
Chloride	0.86	%	0.93	%	278	mg
Magnesium	0.159	%	0.173	%	51	mg
Carnitine	368	mg/kg (ppm)	400	mg/kg (ppm)	11.9	mg
Vitamin E	641	IU/kg	697	IU/kg	21	IU/100 kcal
Vitamin C	239	mg/kg	260	mg/kg	7.7	mg
METABOLIZABLE ENERGY						
kcal/kg	3,096		3,365			
kcal/cup	252					
Weight oz/cup	2.9					
Cups per lb	5.6					
% Calories from:	Protein 32	Fat 27	Carbohydrates 41			

INGREDIENTS — TREATS

Canine Metabolic Advanced Weight Solution: Whole Grain Wheat, Wheat Flour, Chicken Meal, Tomato Pomace, Rice Flour, Flaxseed, Oat Fiber, Coconut Oil, Pork Liver Flavor, Canola Oil, Dried Egg Product, Chicken Fat, Dried Carrots, Iodized Salt, Potassium Chloride, Brewers Dried Yeast, Mixed Tocopherols added to retain freshness, Citric Acid added to retain freshness, Rosemary Extract.

AVERAGE NUTRIENT CONTENTS

	As Fed[1]		Dry Matter[2]		As Fed, Caloric Basis[3]	
Protein	19.3	%	21.1	%	5.5	g
Fat	10.0	%	10.9	%	2.9	g
Carbohydrate (NFE)	53.5	%	58.5	%	15.3	g
Crude Fiber	4.2	%	4.6	%	1.2	g
Calcium	0.71	%	0.78	%	203	mg
Phosphorus	0.56	%	0.6	%	160	mg
Sodium	0.27	%	0.30	%	77	mg
Potassium	0.60	%	0.66	%	171	mg
Magnesium	0.169	%	0.185	%	48	mg
Carnitine	10	mg/kg (ppm)	11	mg/kg (ppm)	0.3	mg
Vitamin E	131	IU/kg	143	IU/kg	4	IU/100 kcal
Vitamin C	1	mg/kg	1	mg/kg	0.0	mg
METABOLIZABLE ENERGY						
kcal/kg	3,499		3,824			
kcal/treat (approx.)	38					
Treats per lb	42					
% Calories from:	Protein 20	Fat 25	Carbohydrates 55			

[1]Differs from label guarantees which are either maximums or minimums. [2]The nutrient in the product after moisture is removed. It is used to make direct comparisons of nutrient profiles with differing moisture contents. [3]Nutrient intake for every 100 kilocalories consumed.

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Appendix

Feline Metabolic Advanced Weight Solution nutritional information

Prescription Diet® Feline Metabolic Advanced Weight Solution

Metabolic Advanced Weight Solution

Prescription Diet® Feline Metabolic Advanced Weight Solution

Obesity

Metabolic Advanced Weight Solution: Cans of 5.5 oz (1958) in cases of 24

Metabolic Advanced Weight Solution: Bags of 4 lbs (1954), 8.5 lbs (1955) and 17.6 lbs (1956)

Metabolic Advanced Weight Solution Treats: Bags of 2.5 oz (1960) in cases of 24

Treats

Indications

Overweight, obesity.

Not recommended for

Growing kittens, pregnant or nursing cats.

Evidence-Based Clinical Nutrition

- In an in-home feeding study 81% of cats experienced weight loss within 2 months.[1]
- Clinically proven to avoid weight regain following a weight loss program.[1]
- Clinically proven to safely provide 29% body fat loss in 2 months in cats.[1]
- The nutrition of Metabolic is clinically proven to work with each cat's unique metabolic response activating the body's natural ability to burn excess body fat and affect calorie utilization.[1]
- 74% of clients/cat owners would recommend the Metabolic formula to their friends with overweight cats[1]

Additional information

- Maintains effective and safe rate of up to 1-2% body weight loss weekly during weight loss period.[1]
- **Prescription Diet® Feline Metabolic Advanced Weight Solution Treats** are designed to complement the nutrition found in **Prescription Diet® Feline Metabolic Advanced Weight Solution** pet food. They are also great with **Prescription Diet® m/d® Feline, r/d® Feline** or **w/d® Feline.**
- These treats contain a blend of ingredients that safely improve metabolism in cats.
- To ensure maximum effectiveness of the **Prescription Diet® Feline Metabolic Advanced Weight Solution** brand cat food, limit **Treats** to 10% or less of the cat's daily energy intake. **Note:** This product may not be appropriate for animals with difficulty maintaining a specific urine pH. Monitoring urine pH and urinalysis is recommended.
- **Prescription Diet® Feline Metabolic Advanced Weight Solution Treats** are intended for intermittent or supplemental feeding only.

Other products to consider

Prescription Diet® r/d® Feline or **Prescription Diet® m/d® Feline** to reach the target body weight. A cat should then be fed **Prescription Diet® w/d® Feline** or **Science Diet® Adult Light Feline** to maintain optimum body weight and avoid weight gain.

These characteristics make **Prescription Diet® Feline Metabolic Advanced Weight Solution** veterinary exclusive pet food useful as a nutritional aid for improving energy metabolism in obese or overweight pets:

KEY BENEFITS

Proprietary bundle of synergistically effective nutrients	High	Provides appetite regulation, reduces inflammation and improves energy metabolism.
Fiber	High	Soluble and insoluble fiber to trigger satiety, control appetite, and maintain gastrointestinal health.
Carnitine	High	Helps cats burn fat while sparing lean muscle mass, resulting in more effective weight loss.
Lysine	High	Helps metabolize fat for energy production and spare lean body mass.
Antioxidants	Added	Defend cells from free radical oxidation, promoting a healthy immune system.

[1] Data on file, Hill's Pet Nutrition, Inc.

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Feline Metabolic Advanced Weight Solution nutritional information

Prescription Diet® Feline Metabolic Advanced Weight Solution

Metabolic Advanced Weight Solution

DAILY FEEDING AMOUNTS

Animal feeding tests using AAFCO procedures substantiate that **Prescription Diet® Feline Metabolic Advanced Weight Solution** pet food provides complete and balanced nutrition for maintenance of adult cats. **The following amounts are a starting point only and should be adjusted as needed to maintain or reach the desired weight.** When feeding food for the first time, mix increasing amounts of the pet's new food with decreasing amounts of the old food over a 7-day period. Concurrent use of urine acidifiers is not recommended. Note: Do not allow obese cats to consume less than 80% of the recommended feeding amounts. Fasting may increase the risk of hepatic lipidosis. Encourage increased water intake. Veterinary supervised exercise may be beneficial in combination with weight loss programs. Supplementation beyond the analogous canned or dry formulas or treats is unnecessary and may decrease the effectiveness of the food. **FOR WEIGHT LOSS:** Determine the amount to feed based on the target weight rather than the current weight. **FOR WEIGHT MAINTENANCE:** Patient should be monitored to ensure proper body weight is maintained. Increase food amounts accordingly.

Ideal Body Weight (lb)	FOR WEIGHT LOSS Can(s) (5.5 oz)	Dry – Cups	Treats	FOR WEIGHT MAINTENANCE Can(s) (5.5 oz)	Dry – Cups	Treats
6	1	⅜	9	1 ⅓	⅝	14
8	1 ¼	½	12	1 ⅔	¾	18
10	1 ⅓	⅝	14	2	⅞	21
12	1 ½	⅔	16	2 ⅓	1	24
14	1 ¾	¾	18	2 ⅔	1 ⅛	27
16	2	⅞	20	2 ¾	1 ¼	30
18	2	⅞	22	3	1 ⅜	32

INGREDIENTS — CANNED

Feline Metabolic Advanced Weight Solution: Water, Pork Liver, Pork By-Products, Corn Flour, Powdered Cellulose, Corn Starch, Chicken, Flaxseed, Tomato Pomace, Natural Flavor, Corn Gluten Meal, Coconut Oil, Calcium Carbonate, Guar Gum, Calcium Sulfate, L-Leucine, Dicalcium Phosphate, Carrot Powder, Iodized Salt, Taurine, vitamins (Vitamin E Supplement, Ascorbic Acid (source of vitamin C), Thiamine Mononitrate, Niacin Supplement, Pyridoxine Hydrochloride, Calcium Pantothenate, Vitamin B12 Supplement, Riboflavin Supplement, Biotin, Folic Acid, Vitamin D3 Supplement), Potassium Chloride, Choline Chloride, minerals (Manganese Sulfate, Ferrous Sulfate, Zinc Oxide, Manganous Oxide, Copper Sulfate, Calcium Iodate, Sodium Selenite), DL-Methionine, L-Threonine, L-Carnitine, Beta-Carotene.

AVERAGE NUTRIENT CONTENTS

	As Fed[1]	Dry Matter[2]	As Fed, Caloric Basis[3]
Protein	9.2 %	39.1 %	11.1 %
Fat	3.0 %	12.8 %	3.6 %
Carbohydrate (NFE)	7.4 %	31.5 %	8.9 %
Crude Fiber	2.4 %	10.2 %	2.9 %
Calcium	0.23 %	0.98 %	278 mg
Phosphorus	0.15 %	0.6 %	181 mg
Sodium	0.09 %	0.38 %	109 mg
Potassium	0.18 %	0.77 %	217 mg
Magnesium	0.022 %	0.094 %	27 mg
Taurine	0.12 %	0.51 %	145 mg
Carnitine	211 mg/kg (ppm)	900 mg/kg (ppm)	25.5 mg
Vitamin E	159 IU/kg	677 IU/kg	19 IU/100 kcal
Vitamin C	69 mg/kg	294 mg/kg	8.3 mg
METABOLIZABLE ENERGY			
kcal/kg	829	3,523	
kcal/can 5.5 oz	129		
% Calories from:	Protein 39 Fat 31	Carbohydrates 30	

[1]Differs from label guarantees which are either maximums or minimums. [2]The nutrient in the product after moisture is removed. It is used to make direct comparisons of nutrient profiles with differing moisture contents. [3]Nutrient intake for every 100 kilocalories consumed.

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Appendix

Feline Metabolic Advanced Weight Solution nutritional information

Metabolic Advanced Weight Solution

Prescription Diet® Feline Metabolic Advanced Weight Solution

INGREDIENTS — DRY

Feline Metabolic Advanced Weight Solution: Chicken By-Product Meal, Brewers Rice, Corn Gluten Meal, Powdered Cellulose, Dried Tomato Pomace, Flaxseed, Dried Beet Pulp, Chicken Liver Flavor, Coconut Oil, Pork Fat (preserved with Mixed Tocopherols and Citric Acid), Lactic Acid, Potassium Chloride, Calcium Sulfate, L-Lysine, Choline Chloride, Dried Carrots, DL-Methionine, Taurine, vitamins (Vitamin E Supplement, L-Ascorbyl-2-Polyphosphate (source of vitamin C), Niacin Supplement, Thiamine Mononitrate, Vitamin A Supplement, Calcium Pantothenate, Riboflavin Supplement, Biotin, Vitamin B12 Supplement, Pyridoxine Hydrochloride, Folic Acid, Vitamin D3 Supplement), minerals (Manganese Sulfate, Ferrous Sulfate, Zinc Oxide, Copper Sulfate, Calcium Iodate, Sodium Selenite), L-Carnitine, Mixed Tocopherols added to retain freshness, Citric Acid added to retain freshness, Beta-Carotene, Phosphoric Acid, Rosemary Extract.

AVERAGE NUTRIENT CONTENTS

	As Fed[1]		Dry Matter[2]		As Fed, Caloric Basis[3]	
Protein	36.6	%	38.7	%	10.7	g
Fat	12.4	%	13.1	%	3.6	g
Carbohydrate (NFE)	29.9	%	31.6	%	8.7	g
Crude Fiber	9.4	%	9.9	%	2.7	g
Calcium	1.00	%	1.06	%	292	mg
Phosphorus	0.79	%	0.8	%	231	mg
Sodium	0.31	%	0.33	%	91	mg
Potassium	0.71	%	0.75	%	208	mg
Magnesium	0.093	%	0.098	%	27	mg
Taurine	0.36	%	0.38	%	105	mg
Carnitine	849	mg/kg (ppm)	898	mg/kg (ppm)	24.8	mg
Vitamin E	644	IU/kg	681	IU/kg	19	IU/100 kcal
Vitamin C	136	mg/kg	144	mg/kg	4.0	mg
METABOLIZABLE ENERGY						
kcal/kg	3,419		3,618			
kcal/cup	298					
Weight oz/cup	3.1					
Cups per lb	5.2					
% Calories from:	Protein 38	Fat 31	Carbohydrates 31			

INGREDIENTS — TREATS

Feline Metabolic Advanced Weight Solution: Chicken By-Product Meal, Brewers Rice, Corn Gluten Meal, Powdered Cellulose, Dried Tomato Pomace, Flaxseed, Dried Beet Pulp, Chicken Liver Flavor, Coconut Oil, Pork Fat (preserved with Mixed Tocopherols and Citric Acid), Lactic Acid, Potassium Chloride, Calcium Sulfate, L-Lysine, Choline Chloride, Dried Carrots, DL-Methionine, Taurine, vitamins (Vitamin E Supplement, L-Ascorbyl-2-Polyphosphate (source of vitamin C), Niacin Supplement, Thiamine Mononitrate, Vitamin A Supplement, Calcium Pantothenate, Riboflavin Supplement, Biotin, Vitamin B12 Supplement, Pyridoxine Hydrochloride, Folic Acid, Vitamin D3 Supplement), minerals (Manganese Sulfate, Ferrous Sulfate, Zinc Oxide, Copper Sulfate, Calcium Iodate, Sodium Selenite), L-Carnitine, Mixed Tocopherols added to retain freshness, Citric Acid added to retain freshness, Beta-Carotene, Phosphoric Acid, Rosemary Extract.

AVERAGE NUTRIENT CONTENTS

	As Fed[1]		Dry Matter[2]		As Fed, Caloric Basis[3]	
Protein	36.6	%	38.7	%	10.7	g
Fat	12.4	%	13.1	%	3.6	g
Carbohydrate (NFE)	29.9	%	31.6	%	8.7	g
Crude Fiber	9.4	%	9.9	%	2.7	g
Calcium	1.00	%	1.06	%	292	mg
Phosphorus	0.79	%	0.8	%	231	mg
Sodium	0.31	%	0.33	%	91	mg
Potassium	0.71	%	0.75	%	208	mg
Magnesium	0.093	%	0.098	%	27	mg
Taurine	0.36	%	0.38	%	105	mg
Carnitine	849	mg/kg (ppm)	898	mg/kg (ppm)	24.8	mg
Vitamin E	644	IU/kg	681	IU/kg	19	IU/100 kcal
Vitamin C	136	mg/kg	144	mg/kg	4.0	mg
METABOLIZABLE ENERGY						
kcal/kg	3,419		3,618			
kcal/treat (approx.)	1					
Treats per (2.5 oz) bag	272					
% Calories from:	Protein 38	Fat 31	Carbohydrates 31			

[1]Differs from label guarantees which are either maximums or minimums. [2]The nutrient in the product after moisture is removed. It is used to make direct comparisons of nutrient profiles with differing moisture contents. [3]Nutrient intake for every 100 kilocalories consumed.

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Contact us and references

Access these resources for more information or answers to questions.

For healthcare team members:

- HillsVet.com/Metabolic
- HWP.HillsVet.com (App available in Android™ and iOS®)
- Hill's Veterinary Consultation Service at 1-800-548-VETS (8387)
- Hill's Board on vspn.org and vin.com

@HillsVet.com

For pet owners:

- HillsPet.com
- Hill's Consumer Affairs at 1-800-445-5777

Facebook.com/HillsPetUS

[1]Klausner JS, Lund E. Banfield Pet Hospital State of Pet Health 2012, 2012.

[2]Ward E, Budsberg S, Bartges J, et al. Big Pets Get Bigger: Latest Survey Shows Dog and Cat Obesity Epidemic Expanding, 2012.

[3]Data on file. Hill's Pet Nutrition, Inc.

[4]Toll PW, Paetau-Robinson I, Lusby AL, et al. Effectiveness of morphometric measurements for predicting body composition in overweight and obese dogs. *J Vet Intern Med.* 2010;24:717.

[5]Lusby AL, Kirk CA, Toll PW, et al. Effectiveness of BCS for Estimation of Ideal Body Weight and Energy Requirements in Overweight and Obese Dogs Compared to DXA (abstract). *J Vet Intern Med.* 2010;24:717.

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[10]Dry formula. Data on file. Hill's Pet Nutrition, Inc.

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weight management

Notes