

**Nestlé Purina  
Companion Animal  
Nutrition Summit •  
26–28 March 2015 •  
Barcelona, Spain**

**Nestlé Purina's  
Companion Animal  
Nutrition (CAN)  
Summit is a  
scientific meeting  
where experts  
gather from around  
the world to explore  
the important  
topic of nutrition  
in veterinary  
medicine. This year  
the CAN Summit  
focused on obesity,  
a significant health  
issue for pets.**

Additional CAN  
Capsules are  
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## FOCUS

### Intermittent Caloric Restriction: A New Way to Feed Cats for Weight Loss

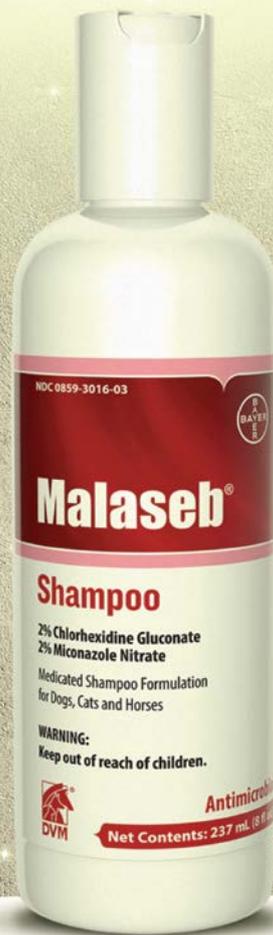
Intermittent caloric restriction (ICR) has been extensively studied in overweight and obese humans and has shown benefits in delaying aging, enhancing lifespan, and delaying or preventing cancer. This study compared the effect of an ICR weight-loss plan with the more traditional CCR plan in 28 obese or overweight cats with body condition scores (BCS) of 7/9 or higher when fed a high-protein, low-fat diet.

Cats in the CCR group were fed 75% of their baseline maintenance energy requirement (MER) for 6 months. Cats in the ICR group were fed 75% of their MER for the first 2 weeks of the month and 100% of their baseline MER for the last 2 weeks of the month for 12 months. It was found that within the study period, only 35.71% of cats in the CCR group reached ideal BCS, whereas 81.82% of cats in the ICR group reached ideal BCS. When weight loss was calculated on an equal caloric-restriction basis, the ICR group had a significantly higher rate of body-fat loss than the CCR group. Direct monthly rates of percentage body-fat and body-weight loss were similar despite the increased caloric intake in the ICR group. This indicates that cats in the ICR group may maintain higher energy expenditure than cats in the CCR group. Lean-body mass was well-maintained in both groups. These results indicate that ICR may be more effective than CCR at promoting healthy body-fat loss.—*Pan Y*

### Plasma Cytokines in Overweight Dogs

Chronic low-grade inflammation in obesity involves increased production of proinflammatory and chemotactic cytokines, both of which contribute to insulin resistance and related comorbidities, including cardiovascular disease, diabetes mellitus, and osteoarthritis. This study evaluated whether weight loss would increase antiinflam-

matory and antioxidant factors and decrease proinflammatory cytokines. Eighteen overweight beagles were fed a high-protein, low-calorie dry dog food at 25% of their individual maintenance energy requirement over 6 months. All dogs reached their ideal weight by the end of the study and were healthier as defined by decreased fat mass and improved insulin sensitivity. The hormone leptin and several proinflammatory cytokines and growth factors all decreased significantly with weight loss. These findings concur with human, rodent, and other canine studies that suggest weight loss improves low-grade inflammation.—*Satyraj E*



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The active ingredients in Malaseb® Shampoo kill susceptible skin pathogens within minutes *in vitro*.<sup>2,\*</sup> A systematic review in 2012 found that there was a sufficient body of "good evidence" to recommend the use of 2% Chlorhexidine in combination with 2% Miconazole against *Malassezia* infections in dogs.<sup>3</sup> With no dyes or added fragrances and available in a variety of sizes, Malaseb® should be your choice for the topical management of susceptible skin pathogens.

For more information, visit [BayerDVM.com](http://BayerDVM.com), call your local Bayer Sales Representative, contact your preferred distributor or call Bayer Customer Service at 1-800-633-3796.

<sup>1</sup> Reference on file. Bayer HealthCare, Animal Health.

<sup>2</sup> Reference on file. Bayer HealthCare, Animal Health.

<sup>3</sup> Mueller RS, Bergvall K, Bensignor E, et al. (2012). A review of topical therapy for skin infections with bacteria and yeast. *Vet Dermatology*. 23:330-341.

\* Studies were performed using Malaseb® Concentrate Rinse (0.2% Miconazole and 0.2% Chlorhexidine); *Staphylococcus pseudintermedius* (also known as *Staphylococcus intermedius*), *Pseudomonas aeruginosa*, *Malassezia pachydermatis*; The clinical significance of *in vitro* data has not been determined.



## Insulin Resistance & Metabolic Adaptability in Obese Cats: 2 Unlikely Partners

Obese individuals are at increased risk for diabetes mellitus, partly because of increased insulin resistance in which pancreatic beta cells still produce insulin, but peripheral tissues do not respond normally to the insulin. Despite similar instances of obesity in humans and cats, the incidence of diabetes mellitus is much higher in humans, suggesting that obese cats appear to maintain euglycemia and adapt their metabolic needs. This report describes using the euglycemic-hyperinsulinemic clamp, the gold standard method for measuring insulin sensitivity, to calculate whole-body glycolysis and total-body

glycogen synthesis. It was found that for each kilogram of body weight increase in cats, insulin resistance increased by approximately 15% to 30%. However, despite the insulin resistance, insulin output increased and fasting plasma glucose levels remained normal; this highlights that peripheral insulin resistance is a poor indicator of glucose tolerance. Further investigation into hepatic metabolic pathways revealed that obese cats have a lower endogenous glucose production (EGP) because of lower glycogenolysis and/or gluconeogenesis; this naturally decreased EGP helps offset the effect of insulin

resistance on peripheral glucose uptake. Additionally, it was found that the hepatic Krebs cycle is more active in female obese cats along with an increase in pyruvate cycling that helps protect against excessive EGP; this provides a mechanism as to why fewer female cats are diabetic than males. In prediabetic cats, there appears to be a quick switch from the euglycemic to the hyperglycemic state that indicates rapid development of diabetes mellitus, likely from hepatic insulin resistance and decreased beta cell numbers and function.—*Hoening M*

## The Paradox of Healthy Obesity

Obesity, defined as a body mass index of  $>30$  kg/m<sup>2</sup> in humans, is typically associated with metabolic dysfunction and increased inflammation. Unhealthy obese individuals typically exhibit at least 3 risk factors (eg, type 2 diabetes mellitus, dyslipidemia, hypertension) for metabolic syndrome. There are some individuals (estimated at 10% to 30% prevalence), however, who have high insulin sensitivity, no sign of hypertension, and normal lipid, inflammatory, and hormonal profiles (ie, low triglycerides and C-reactive protein concentrations, high HDL cholesterol and adiponectin concentrations). These individuals seem to be at less risk for cardiovascular and metabolic disease than “unhealthy” obese individuals. One proposed hypothesis for the mechanism behind this protective effect of obesity is extra lean-body mass associated with obesity (ie, obese individuals

have both extra adipose and muscle tissue) may actually provide a greater reserve in catabolic diseases. A better understanding of this metabolically benign obesity is important in terms of formulating individual weight-loss plans as well as for future research.

In veterinary medicine, research is beginning to identify cases in which there may be an association between higher body weights and survival. For example, in cats with congestive heart failure, shorter survival times were associated with low-body-weight individuals than those with moderate or higher body weights. It is still unclear if a clinically applicable method to assess insulin sensitivity could be beneficial in veterinary medicine in order to better formulate individual weight-loss programs.—*Armstrong PJ*

# Effective Strategies, Dialogues, & Tools for a Successful Weight-Management Program

As little as 15% extra body fat can shorten a dog's life expectancy and is linked to a host of medical conditions. To combat the health issues related to overweight animals in their practice, a clinic in Wisconsin organizes a yearly pet weight-loss contest to motivate clients. A history is taken and the weight, body condition score (BCS), and ideal body weight (IBW) are recorded. Clients are carefully questioned about their beliefs on food, family issues that may play a role in their pets' condition, and any related biases they may hold. Because these are often emotional subjects, veterinarians must proceed with sensitivity. Once an IBW has been determined, food and calorie recommendations (usually 60% to 80% of resting energy requirement of IBW for dogs, 50% to 70% for cats)

are made, and clients are sent home with tools for success (eg, measuring cups, protein and calorie comparisons for food and treats). The contest is organized around a wellness fair kickoff and final weigh-in along with 2 mid-point weigh-ins. Fun components include online updates of contestant progress and donations made to rescue organizations for every pound lost. Donations from pet food companies and veterinary biological companies help defray costs and provide prizes to the winners. Although the contest takes great time and effort from the team, it boosts client bonds and alliances with local rescue organizations. The focus on weight management in the practice continues year-round.—

Lambrecht KJ

**As little as 15% extra body fat can shorten a dog's life expectancy.**

## vetsulin® (porcine insulin zinc suspension)

136855 R6

NADA 141-236, Approved by FDA

### CAUTION

Federal law restricts this drug to use by or on the order of a licensed veterinarian.

### INDICATION

vetsulin® (porcine insulin zinc suspension) is indicated for the reduction of hyperglycemia and hyperglycemia-associated clinical signs in dogs and cats with diabetes mellitus.

### CONTRAINDICATIONS

Dogs and cats known to have a systemic allergy to pork or pork products should not be treated with vetsulin®. vetsulin® is contraindicated during periods of hypoglycemia.

### WARNINGS

**User Safety:** For use in animals only. Keep out of the reach of children. Avoid contact with eyes. In case of contact, immediately flush eyes with copious amounts of water for 15 minutes. Accidental injection may cause clinical hypoglycemia. In case of accidental injection, seek medical attention immediately. Exposure to product may induce a local or systemic allergic reaction in sensitized individuals.

**Animal Safety:** Owners should be advised to observe for signs of hypoglycemia (see Owner Information Sheet). Use of this product, even at established doses, has been associated with hypoglycemia. An animal with signs of hypoglycemia should be treated immediately. Glucose should be given orally or intravenously as dictated by clinical signs. Insulin should be temporarily withheld and, subsequently, the dosage should be adjusted, if indicated. Any change in insulin should be made cautiously and only under a veterinarian's supervision. Changes in insulin strength, manufacturer, type, species (animal, human) or method of manufacture (rDNA versus animal-source insulin) may result in the need for a change in dosage.

Appropriate diagnostic tests should be performed to rule out endocrinopathies in pets that are difficult to regulate (e.g., hyperadrenocorticism in dogs and hyperthyroidism in cats).

### PRECAUTIONS

Animals presenting with severe ketoacidosis, anorexia, lethargy, and/or vomiting should be stabilized with short-acting insulin and appropriate supportive therapy until their condition is stabilized. As with all insulin products, careful patient monitoring for hypoglycemia and hyperglycemia are essential to attain and maintain adequate glycemic control and prevent associated complications. Overdosage can result in profound hypoglycemia and death. Progestogens, certain endocrinopathies, and glucocorticoids can have an antagonistic effect on insulin activity. Intact bitches should be ovariohysterectomized. Progestogen and glucocorticoid use should be avoided.

### Drug Interactions:

In the US clinical effectiveness studies, dogs and cats received various medications while being treated with vetsulin® including antimicrobials, antivirals, antifungals, antihistamines, analgesics, anesthetics/tranquilizers, diuretics, electrolytes, corticosteroids (cats), NSAIDs, thyroid hormone supplementation, hyperthyroid medication (methimazole), internal and external parasiticides, anti-emetics, dermatological topical treatments and oral supplements, ophthalmic preparations containing antimicrobials and antiinflammatories, and various vaccines. No medication interactions were reported. This drug was not studied in dogs receiving corticosteroids.

**Reproductive Safety:** The safety and effectiveness of vetsulin® in breeding, pregnant, and lactating dogs and cats has not been evaluated.

**Use in puppies and kittens:** The safety and effectiveness of vetsulin® in puppies and kittens has not been evaluated.

### ADVERSE REACTIONS

#### Dogs

In the field effectiveness and safety study, 66 dogs were treated with vetsulin®. Sixty-two dogs were included in the assessment of safety. Hypoglycemia (defined as blood glucose < 50 mg/dL) with or without associated clinical signs occurred in 35.5% (22/62) of the dogs at various times during the study. Clinical signs of hypoglycemia were generally mild in nature (described as weakness, lethargy, stumbling, falling down, and/or depression). Disorientation and collapse were reported less frequently and occurred in 16.1% (10/62) of the dogs. Two dogs had a seizure and one dog died during the seizure. Although never confirmed, the presumptive diagnosis was hypoglycemia-induced seizures. In the rest of the dogs, hypoglycemia resolved with appropriate therapy and adjustments in insulin dosage. Seven owners recorded the following observations about the injection site on the home monitoring forms: swollen, painful, sore, and a bleb under the skin.

The following clinical observations occurred in the field study following treatment with vetsulin® and may be directly attributed to the drug or may be secondary to the diabetic state or other underlying conditions in the dogs: hematuria, vomiting, diarrhea, pancreatitis, non-specific hepatopathy/pancreatitis, development of cataracts, and urinary tract infections.

In a 21-day field safety and effectiveness study, 40 dogs, already well controlled on vetsulin®, were administered vetsulin® using a VetPen™ insulin pen loaded with a pre-filled 2.7 mL vetsulin® cartridge and 29 gauge/12 mm pen needles. All dogs enrolled in the study were evaluated for safety. Loss of diabetic control was reported in 10 dogs, 3 of which were withdrawn from the study. Four dogs' loss of control resolved after dose adjustment while still using the insulin pen. For the remaining 3 dogs, the loss of diabetic control was reported at the end of the study and outcome was not documented. Two dogs had injection site reactions: edema in one dog and two instances of crusting in another. Poor appetite and weight loss was reported in one dog.

#### Cats

In a field effectiveness and safety study, safety data was reported for 78 cats receiving vetsulin®. Hypoglycemia (defined as blood glucose < 50 mg/dL) was reported in 61 cats (88 total incidences). Fifteen of the occurrences (involving 13 cats) were associated with clinical signs described as lethargy, diarrhea, decreased appetite/anorexia, vomiting, and hypothermia. One cat had seizures following accidental overdosing by the owner and again during the subsequent dose adjustment period. The cat responded to supportive therapy and had no further hypoglycemic episodes. In all cases of hypoglycemia, the clinical signs resolved following symptomatic treatment and/or dose adjustment.

Polyneuropathy was reported in 4 cats. Two injection site reactions were reported: one as a mildly thickened subcutaneous tissue reaction and the second as a mild bruising.

The following clinical observations occurred in the field study following treatment with vetsulin® and may be directly attributed to the drug or may be secondary to the diabetic state or other underlying conditions in the cats: vomiting, lethargy, diarrhea, decreased appetite/anorexia, pancreatitis, dermal events, respiratory disease, urinary tract disorder, renal disease, dehydration, weight loss, polydipsia, polyuria, behavioral change, and ocular discharge/conjunctivitis. In a smaller field effectiveness and safety study, 14 cats were treated with vetsulin®. Hypoglycemia was reported in 6 cats (8 total occurrences).

Lethargy not associated with hypoglycemia was reported in 4 cats (6 total occurrences). The following clinical observations occurred in the field study following treatment with vetsulin® and may be directly attributed to the drug or may be secondary to the diabetic state or other underlying conditions in the cats: foul odor to stool, diarrhea, dull coat, rapid, shallow breathing, stiff gait in rear, gallop rhythm, and pruritus with alopecia.

During the 1998–2007 period, the following adverse events in 50 cats treated with porcine insulin zinc suspension were reported to Intervet International and Intervet Inc: Death, seizures, lack of effectiveness/dysregulation, hypoglycemia, allergic or skin reaction, lethargy, vomiting/diarrhea, injection pain, hyperthermia, nystagmus, PU/PD, and abnormal behavior.

In a 21-day field safety and effectiveness study, 36 cats, already well controlled on vetsulin®, were administered vetsulin® using a VetPen™ insulin pen loaded with a pre-filled 2.7 mL vetsulin® cartridge and 29 gauge/12 mm pen needles. Loss of diabetic control was reported in three cats all of which resolved after dose adjustment while still using the insulin pen. Hypoglycemia was reported in one cat. The cat recovered with supportive care and dose adjustment.

To report suspected adverse drug experiences, call Merck at 1-800-224-5318.

For additional information about adverse drug experience reporting for animal drugs, contact FDA at 1-888-FDA-VETS, or <http://www.fda.gov/AnimalVeterinary/SafetyHealth>

**Use contents within 42 days of first puncture.**

**Supplied:** 10 mL vial and 2.7 cartridge

Additional information about vetsulin®, VetPen™, and diabetes mellitus can be found at [www.vetsulin.com](http://www.vetsulin.com)

Distributed by: Intervet Inc (d/b/a Merck Animal Health)

Summit, NJ 07901

Made in Germany

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