

ask the expert

You have asked ...

What insulin should be used in cats and dogs now that Eli Lilly has announced that they are discontinuing Humulin lente and Humulin ultralente insulin?



The Expert Says ...

Switching to Another Insulin: What & How

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With the discontinuation of Lilly's human lente (Humulin L) and ultralente (Humulin U) insulin preparations, veterinarians should familiarize themselves with the remaining options for insulin therapy. There are 3 types of insulin: insulin preparations may be short-acting (regular insulin), intermediate-acting (Lente and NPH [isophane insulin]), or long-acting (glargine [Lantus—Aventis Pharmaceuticals] and bovine PZI [protamine zinc insulin; PZI Vet—Idexx Pharmaceuticals]). For NPH and PZI, protamine is added to regular insulin in increasing concentrations to retard insulin absorption and prolong its duration; addition of zinc further prolongs

the duration of PZI. Lente insulin is a mixture of 30% prompt zinc-insulin suspension and 70% ultralente that is slowly absorbed because of the large crystal size. Glargine is a long-acting recombinant human insulin analog used for basal insulin replacement once daily in humans. Feline insulin is most similar to bovine insulin, differing by one amino acid in the A chain; bovine insulin is only available as PZI. Porcine insulin is preferred in dogs because it is identical to canine insulin and is available as porcine lente insulin (Vetsulin—Intervet). Human insulin is available as regular (Humulin R, Novolin R), lente (Novolin L), NPH (Humulin N, Novolin N), and glargine (Lantus).

Glargine is available only as U-100 concentration in 2.5- and 10-ml vials. The pH is low (4) and may sting on injection. For cats, bovine PZI insulin is available as U-40 concentration insulin in 10-ml vials; for dogs, porcine lente insulin is available as U-40 concentration insulin in 2.5 and 10-ml vials.

Owners must use syringes appropriate for the concentration of insulin. The U-100 insulin syringes are manufactured at 0.3-, 0.5-, and 1-ml capacities; U-40 syringes have a 0.5- to 1-ml capacity.

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Protocol for Changing Insulin from Human Lente or Ultralente to Bovine PZI, Porcine Lente, or Glargine or NPH Human Insulin

Cats. Initially, administer bovine PZI (U-40) or glargine (U-100) insulin twice daily. The starting dose is 1 to 2 U Q 12 H; if the cat was receiving more than 2 U of insulin before the change, reduce to 2 U or less per dose to avoid hypoglycemia. Glucose toxicity often resolves, resulting in reduced dosing or elimination of insulin. Feed diabetic cats a high-protein, low-carbohydrate diet to facilitate insulin action.

Dogs. Administer porcine lente (U-40), human lente (Novolin L), or human NPH (U-100) insulin twice daily. The starting dose is 0.5 U/kg SC Q 12 H. If changing from human lente insulin, use the same dose as before; if changing from human ultralente insulin, reduce by 25% per dose or start over. Feed a high-fiber, low-fat diet.

Monitoring

Daily home monitoring with urine test strips (Ketodiastix—Bayer or Glucotest—Lightstar Enterprises) should be used to prevent hypoglycemia. More than 2 consecutive days of negative urine glucose readings should prompt a decrease in insulin dosage. Measure serum fructosamine and perform chemistry profiles periodically (every 3 to 4 weeks) or measure blood glucose curves weekly until regulation is achieved. In the author's experience, cats should be monitored with home urine glucose measurements combined with monthly fructosamine and chemistry profiles. Dogs may also be monitored with fructosamine, but blood glucose curves are an additional variable that may help determine how frequently insulin needs to be administered (once or twice daily). ■

See Aids & Resources, back page, for references, contacts, and appendices.