



Insulinomas in Ferrets

By: Catherine Love, DVM

Updated 2021

What is an insulinoma?

An insulinoma is an insulin-producing tumor that occurs on the pancreas. Insulin is responsible for decreasing glucose (blood sugar) and is normally inhibited when glucose is low. However, insulinomas ignore normal shut-off mechanisms and will continue to produce insulin even when glucose is dangerously low. Insulinomas are very common tumors in ferrets and do not normally metastasize (spread to other organs).

What causes an insulinoma to occur?

An exact link has not been proven, but it is suspected that a combination of genetics and high carbohydrate diets play a role in the formation of these tumors. Most ferrets in the US are produced by a single supplier, which limits genetic diversity and may contribute to a predisposition for insulinomas. Abnormal pancreatic tissue has been found in ferrets as young as 2 weeks old. Additionally, high carbohydrate kibble or an abundance of sugary treats likely play a role as well. Ferrets are obligate carnivores with very high protein requirements and a low tolerance for carbohydrates. Research is still ongoing to determine the link between diet, genetics, and insulinoma formation.

What are the symptoms?

At first, symptoms may be subtle. A ferret may be a little lazier or sleepier than usual. As signs progress, hind limb weakness, weight loss, salivation, pawing at the face, stumbling, muscle tremors, and more pronounced lethargy may be noted. More severe symptoms include seizures, loss of consciousness, incoordination, and collapse. These symptoms are a result of the ferret's low blood sugar; a sudden occurrence of severe symptoms is called a hypoglycemic crisis.

What do I do if my ferret has a hypoglycemic crisis?

If the ferret is having a seizure, keep in mind that they are not conscious or in control of their body, so be cautious about putting fingers near their mouth. Accidental bites can occur. Sudden onset of neurologic signs, extreme lethargy, or loss of consciousness is an emergency, and the first step is to contact your vet. Corn syrup or honey can be rubbed on the gums to give a quick blood sugar boost, but this is only temporary and can cause a "rebound hypoglycemia" where the ferret's blood sugar will quickly drop back down. It is important to get them to an emergency vet quickly, so they can be assessed and stabilized. Keep the ferret calm and comfortable, and remove them from any areas where they could fall or become tangled in something. If they are having a seizure, they will likely be dazed and disoriented when they come out of it.





How is an insulinoma diagnosed?

Low blood sugar is strongly suggestive of an insulinoma. The only definitive method to get a diagnosis is to analyze a microscopic sample of the pancreas to look for the tumor. As this requires more invasive techniques, glucose below a specific threshold, as well as response to therapy, is considered diagnostic in most cases.

How is it treated?

There are both surgical and medical options for treating insulinomas. Surgery involves removing nodules and abnormal pancreatic tissue to obtain a definitive diagnosis and slow the disease progression. There tends to be a longer duration of symptom relief with surgery as opposed to medical management alone. However, it is an invasive procedure, and not every ferret is a good candidate. In cases where surgery is not an option, steroids are the preferred treatment. Ferrets tolerate steroids very well, even with long-term therapy. An insulin inhibiting medication such as diazoxide may also be added.

What kind of nutrition does a ferret with an insulinoma need?

Ferrets have a very short GI transit time, meaning food moves through them very quickly. They eat small meals frequently throughout the day rather than one or two big meals with fasting in between. For a ferret with an insulinoma, it is of extra importance to avoid any fasting, as this can cause their blood sugar to crash. Ferrets with insulinoma should always have food readily available. They should never be fed any sugary treats (including commercial treats, which are generally unhealthy for ferrets) and their diet should be high protein, low carbohydrate food. Ferret nutrition is a subject of debate and there is no agreed-upon "best" diet for ferrets. Cereal grains, dog food, low-quality cat food, and high carbohydrate foods should be avoided. It has been suggested that carbohydrates in ferret diets should be less than 15%. This author chooses to feed Wysong ferret food.

How long will a ferret with an insulinoma live?

Survival time is dependent on the type of therapy and the ferret's response to treatment. A combination of surgery and medical management appears to give the longest disease-free period. However, even medical management alone has resulted in survival times of around 18 months. Insulinomas also may occur simultaneously with other diseases such as adrenal disease or other tumors, which can affect survival time. Ferrets being treated for insulinoma will need regular blood glucose checks to ensure their blood sugar is not dropping too low. Checking blood sugar is a quick, non-invasive procedure that only requires a small amount of blood.

