

Diabetes and Samoyeds

Recognising and having your Samoyed diagnosed with diabetes can feel overwhelming. However, don't panic it is perfectly manageable and, it is important to say, with the right care your diabetic dog can lead a perfectly normal life and have a normal life span. IT IS NOT A DEATH SENTENCE. That is something which cannot be emphasised enough. Having said all of that, Samoyeds are very prone to diabetes and the breed is assisting in funding research into this topic. This piece aims to answer many of the questions we all have when our dog becomes diabetic.

What is diabetes?

Diabetes mellitus is a condition that affects the amount of glucose, or sugar, in your dog's blood. Diabetes occurs when your dog's body makes too little insulin, stops producing it completely, or has an abnormal response to insulin.

What causes diabetes?

Diabetes occurs the glucose-insulin connection isn't working as it should. Diabetes occurs in dogs in two forms:

- Insulin-deficiency diabetes—This is when the dog's body isn't producing enough insulin. This happens when the pancreas is damaged or otherwise not functioning properly. Dogs with this type of diabetes need daily shots to replace the missing insulin. *This is the most common type of diabetes in dogs.*
- Insulin-resistance diabetes—This is when the pancreas is producing some insulin, but the dog's body isn't utilizing the insulin as it should. The cells aren't responding to the insulin's "message," so glucose isn't being pulled out of the blood and into the cells. This type of diabetes can especially occur in older, obese dogs.

Female dogs can also develop temporary insulin resistance while in heat or pregnant.

What happens with diabetes?

Whatever the type of diabetes, the negative effects on the body are the same. Excessive sugar builds up in the dog's bloodstream, and yet the body's cells that *need* that sugar can't access it.

So the "bad" effects that diabetes causes in the dog's body are twofold:

- Cells are starved for vital “fuel.” Muscle cells and certain organ cells are deprived of the glucose “fuel” they need for energy. In response, the body starts breaking down its own fats and proteins to use as alternative fuel.

- High sugar level in the bloodstream damages many organs. Without insulin to help convert the glucose in the bloodstream into fuel, high levels of glucose build up in the blood. Unfortunately, this abnormal blood chemistry acts like a sort of poison and eventually causes multi-organ damage. This often includes damage to the kidneys, eyes, heart, blood vessels, or nerves.

Diabetes cannot be left untreated.

What are the signs and symptoms my dog may be diabetic?

Early signs. The owner will sometimes notice certain symptoms that can be early signs of diabetes:

- **Excessive thirst.** The dog may drink frequently and empty the water bowl more often.
- **Increased urination.** The dog may ask to go outside frequently and may start having “accidents” in the house. Increased urination (and increased thirst) happens because the body is trying to get rid of excess sugar by sending it out through urine, along with water that bonds to the sugar.
- **Weight loss.** The dog can lose weight despite eating normal portions. This is because the dog isn’t efficiently converting nutrients from its food.
- **Increased appetite.** The dog can be very hungry all the time because the body’s cells aren’t getting all the glucose they need, even though the dog is eating a normal amount.

Advanced signs. In more advanced cases of diabetes, symptoms can become more pronounced and can include:

- Loss of appetite
- Lack of energy
- Depressed attitude
- Vomiting
- The dog can also go off its legs

How does my vet diagnose diabetes?

Your vet can do simple tests to check for diabetes, including testing for excessive glucose (sugar) in the blood and urine. Blood tests can also show other indications of diabetes, such as high liver enzymes and electrolyte imbalances.

The sooner diabetes is diagnosed and treatment begun, the better chance the pet has of a normal life.

What makes a dog at risk of diabetes?

- **Age.**
While diabetes can occur at any age, it mostly occurs in middle-aged to senior dogs. Most dogs who develop it are age 5 or older when diagnosed.
- **Gender.**
Unspayed female dogs are twice as likely as male dogs to have diabetes.
- **Chronic or repeated pancreatitis.**
Chronic or repeated pancreatitis (inflammation of the pancreas) can eventually cause extensive damage to that organ, resulting in diabetes.
- **Obesity.**
Obesity contributes to insulin resistance and is a risk factor for pancreatitis, which can lead to diabetes.
- **Steroid medications.**
These can cause diabetes when used long-term.
- **Cushing's disease.**
With Cushing's disease, the body overproduces steroids internally, so this condition also can cause diabetes.
- **Other health conditions.**
Some autoimmune disorders and viral diseases are also thought to possibly trigger diabetes.
- **Genetics.**
Diabetes can occur in any breed or mixed-breed, and it seems genetics can play a role in either increased or reduced risk. A 2003 study found that overall, mixed-breeds are no less prone to diabetes than are purebreds. Among purebreds, breeds vary in susceptibility, some with very low risk and others with higher risk. Some that may be at higher risk include Samoyeds

What is the best way to stabilise my dog?

One thing to bear in mind that it will take time and some trial and error to get your dog stabilised with diabetes. This will involve working out the best food for them, the right amount of food, the right amount of insulin to be given and of course, working out what environmental factors affect their blood sugar levels e.g. exercise, stress and heat can all play a part. To help see how your dog is doing, your vet will want to do a blood glucose curve which will involve them staying at the vets for the day. Until your sam is stabilised you will be best friends with your vet and on an ongoing basis, will need to discuss, levels and adjustments.

What is a curve?

A curve is a series of blood prick tests performed throughout the day to observe how your dog is responding to insulin therapy. By running a curve, you will be able to see the pattern of glucose levels in the blood throughout the day to determine whether your dog's insulin dose or food needs adjusting. Tests are taken at fasting (just before feeding AM and PM meals) then every two hours over a 12 hour period. Curves should ideally be performed at home where a dog is most comfortable and relaxed. Many dogs suffer anxiety and stress when kept at the vets for the day which can give inaccurate glucose readings.

In order to test at home, you will need to purchase an Alphatrack glucose monitor and these are available from places like Animed, Viovet, Pet Supermarket etc on line. You can then get your vet to show you how to test properly. In addition, it is worth obtaining some Ketodiastix which test for blood glucose and ketones in the urine which are good but not as accurate as the Alphatrack. Ketodiastix are available from Animed Online, Viovet, Petdrugsonline and Hyperdrug.

What can go wrong?

Uncontrolled diabetes can lead to devastating effects on the dog's body, which is why early detection and proper treatment are crucial. Effects of diabetes on the dog's health can include:

- Cataracts (leading to blindness)
- Glaucoma (see our fact sheet on eye testing)
- Enlarged liver
- Urinary tract infections
- Seizures
- Kidney failure
- Ketoacidosis, a potentially life-threatening acute condition
- Hyperglycaemia
- Hypoglycaemia.

What are ketones and ketoacidosis?

Ketones are a by-product of the body burning its own fat. When there isn't enough insulin in the body, it will use existing fat and muscle instead of using glucose for energy. The liver then converts fatty acids into ketones and releases them into the blood stream. If ketones are permitted to increase and paired with high glucose levels, they can rapidly develop into Ketoacidosis. Diabetic ketoacidosis (DKA) is a very dangerous complication which will need vet intervention as soon as possible.

The symptoms of Ketoacidosis are as follows -

Vomiting

Refusal to eat

Dehydration

An unusual smell on the breath – similar to the smell of pear drops

Deep laboured breathing

Rapid heartbeat

Confusion and disorientation

You can watch for ketones in your dog's urine by testing daily with ketodiastix. If you have readings over trace you must speak to your vet straight away. If your dog has ketone levels between negative and trace, encourage drinking and urinating over the following 24 hours to help flush them through.

What is hypoglycaemia and how do I recognise it?

Hypoglycaemia means to have blood sugar levels that are too low.

Hypoglycaemia is anything below 4 mmol/L and if left untreated can be fatal.

Signs of hypoglycaemia are hunger, restlessness, shivering, ataxia, confusion and disorientation, collapse, convulsions and coma. Some dogs may just become quiet and sleepy, others show no signs at all which is why it is so very important to home test glucose levels. If you suspect your dog is having a hypoglycaemic episode, an immediate oral administration of glucose solution or honey should be given (rubbed on the gums) followed by a fast acting carbohydrate. Test glucose levels every 15 minutes until above 5 mmol/L, repeating the application of honey on the gums if necessary and then test glucose levels every 30 minutes until they reach 8 mmol/L. Contact your vet for further advice.

What is hyperglycaemia and how do I recognise it?

Hyperglycaemia means to have high blood sugar levels.

High glucose levels can be caused by many things including an insufficient insulin dose, feeding too much food, infections and illness and medications. In this state, a diabetic dog can develop Ketones in the blood. Ketones are an acid remaining when the body burns its own fat. Ketones build up due to insufficient insulin helping fuel the bodys cells and if left untreated can lead to Ketoacidosis so it is very important to maintain safe glucose levels in the body.

Hyperglycaemia is not immediately life-threatening however, consistent hyperglycaemia can lead to Ketoacidosis which can be fatal and can also cause many other problems throughout the body. Weight loss caused by hyperglycaemia is a result of energy (glucose) not getting into the cells, a consistently hyperglycaemic dog is literally starving. Hyperglycaemia can also cause blindness and cataracts to form in the eyes. This can happen slowly over a period of time or rapidly overnight. Hyperglycaemia can also cause dehydration, pancreatitis, damage to nerves, kidneys and blood vessels and is the main cause of urinary tract infections in diabetic dogs.

Signs of hyperglycaemia include frequent urination, sticky urine, excessive thirst, increased appetite, weight loss, cloudy eyes, blindness, stomach problems and lethargy. If your dog's

glucose levels are high, encourage frequent drinking and urinating as this will help flush out any build up of ketones.

Exercise often helps bring glucose levels down but should be monitored closely with a blood glucose monitor.

How can I monitor my dogs blood glucose levels?

Whilst the vets can monitor your dog's blood glucose by doing a curve or a fructosamine test, on a day to day level it is up to you. As your dog stabilises and you start to know the triggers for your dog, then you will have a better idea of what is going on by watching the dog. However, there is no substitute for home testing. This can be done by using ketodiastix which are dipped in the dog's urine and measure the ketones and blood sugar levels. This test though is not as accurate as doing home blood testing. To do home blood testing, you will need an Alphtrack glucose monitor which you can buy from Viovet, Animed Direct or Pet Supermarket all on line. The glucose monitor requires a drop of blood from the dog and measures the glucose. Your vet can show you how to calibrate and use the monitor properly in the same way as they teach you how to inject your dog. There are a number of places you can take blood on your dog, the ear, (but with a Samoyed you will need to keep a small area shaved), the lip, the elbow callus and foot pads depending on your preference and your dog's comfort level. If you use the ear, make sure it is warm. If not, hold it between your hands for about one minute.

Home testing generally gives a more normal blood glucose reading as the dog is relaxed than when at the vets.

You should test your dog before feeding and this will ensure that you are not using too much insulin for the dog. You should regularly discuss your results with your vet.

There are some very good pages on Facebook for people with diabetic dogs such as UK Diabetic Dogs; Dogs Diabetic and Raw Fed as well as the Diabetic Samoyed page. There is a lot of good information on these pages about how to calculate the fat content in food as well as a good place to ask questions as the majority of the people have diabetic dogs and a lot of experience dealing with diabetics. However, it is not a substitute for seeking veterinary advice but a good back up.

Some vets are not keen on home testing and I am not clear why that might be. There are no reasons not to home test your dog's blood glucose levels if you can, and so many reasons to home test. Home testing is the best way to keep your dog safe from hypoglycaemic episodes, give you peace of mind and help to get your pet's diabetes regulated quicker. A human diabetic would not inject a potentially lethal drug without testing their current levels first and it should be no different for your dog. Home testing costs less than sending your dog to the vet for regular curve tests and will give you a more accurate reading in a comfortable and familiar environment.

What's a fructosamine test and what does it do?

A fructosamine blood test will tell you the average glucose level readings from the past couple of weeks (a home glucose monitor has this same feature). A fructosamine test will not alert you to any low glucose levels a dog may be experiencing.

Fructosamine is measured from a single blood sample. No special preparation (e.g., fasting) is required

Advantages of the fructosamine test

- Distinguishes hyperglycemic, dogs without diabetes from diabetes with chronic hyperglycemia.
- Does not appear to be influenced by transient hyperglycemia.
- Useful in evaluating longer-term control and owner compliance with insulin treatment.

Limitations of fructosamine measurements

- Unable to detect short-term or transient abnormalities in the blood glucose concentration, eg, transient daily episodes of hypoglycemia. This would require serial measurement of blood glucose concentrations.
- Albumin and fructosamine concentrations are highly correlated in dogs. Dogs with hypoalbuminemia also have a decreased fructosamine concentration (false negative)—the laboratory performing the analysis should be consulted as to whether a correction is required and whether or not this has been done.

Can I manage my dog's diabetes purely by diet?

No. There is no cure for diabetes in dogs. Dogs have Type 1 Diabetes where the insulin production in the pancreas is permanently destroyed. You can successfully manage your dog's diabetes with a good diet and insulin therapy but you cannot cure it. Don't waste your money on products sold in shops and online that claim to cure diabetes in dogs.

What can I feed my diabetic?

You should discuss with your vet what diet is appropriate for your dog and there is also plenty of good advice on feeding diabetic dogs on the facebook pages mentioned above. If your dog was fed raw prior to becoming diabetic you can still continue with this but it does require ensuring that the food you obtain has a low fat content. For that you need to work out the dry weight fat content and calories. It is a bit of a faff initially but you soon become aware of what foods have the lowest fat and work with those. The simple rule is nothing white! So no white rice, white pasta etc.

With any dog food you need to read the label carefully as some contain hidden sugars, such as sucrose, fructose and other simple carbohydrates that can result in higher blood sugar levels so watch for sugar, corn syrup and honey on the labels.

Food should be divided into two **equal** meals per day at 10 to 12 hours apart followed by their insulin injection.

Can I feed my diabetic dog treats?

Yes, very occasionally but not the usual shop bought treats that he is used to having. Shop bought treats contain sugars, high fat, flavourings, colourings, flours and oils. All a big No - No for diabetic dogs. Instead try things such as one or two frozen or warmed green beans or a small cube of cucumber, a tsp of fat free cottage cheese, a bite size piece of skinless chicken or turkey breast, a sprat or some scrambled egg white, or an ice cube. Even though most dogs can have these occasional treats without it affecting their blood sugar levels too much, you should check your dog's glucose levels before and after a treat to see the affect it has on his glucose levels. Ideally, treats will be limited to 'after injection' rewards.

Can I free feed by diabetic dog?

No. Your dog needs a diet that will work with their insulin dose to keep glucose levels stable. Free feeding will cause glucose levels to spike throughout the day. You should maintain a schedule of feeding the exact same meal, twice a day at the same time, 12 hours apart.

Is it OK to inject my dog before feeding?

No. You should never inject insulin before your dog has eaten. This is because of the risk of your dog refusing to eat or if he is sick after eating his food. If this happens and you have already administered insulin, you risk your dog becoming dangerously hypoglycaemic. We can all say "But my dog is never sick" or "My dog never refuses food". Until they ARE sick and DO refuse their food. The optimum time is feeding and then waiting about 10 minutes before injecting.

What happens if my dog is sick after eating?

If your dog has been sick and he will eat it again, let him! As gross as that sounds to us, it's a sure way of knowing your dog has the right amount of food in his system to work with the insulin. If he is not willing to eat it, see if he will eat another meal. If he is refusing any further food, contact your vet for advice straight away.

What do I do if my dog only eats part of his/her meal?

Very rarely should you miss a dose as a diabetic dog still needs some insulin for his basal needs. If your dog doesn't eat or only eats a quarter of his food AND is in a safe glucose range of 11 mmol/l or above, you can give 1/4 of the usual dose of insulin. If your dog eats half of his meal, you can give 1/2 of the usual dose of insulin. If your dog eats 3/4 of his food then you can give 3/4 of the usual dose of the insulin.

Can I Feed and Inject earlier/ later than my normal time?

Occasionally something may crop up that makes it difficult to feed and inject at our usual time. Luckily we have the option to use what is known as 'The Golden Hour'. This means you can feed and inject an hour before or after your usual time without it affecting the following feed and dose. Never inject less than 11 hours from the last injection as this may cause an overlap of two insulin doses working at the same time in the system.

Where is the best place to inject my dog?

Insulin injections should be given just under the skin. Many dogs tolerate the injections well. Injections can be given about one to two inches from the middle of the back, near the shoulder blade or hip bone. Be sure to alternate the location each time you give an injection to avoid soreness. Also when giving an injection ensure you have a good tent of skin.

What do I do if I make a fur shot?

A fur shot is when you inject the insulin but instead of it all going under the skin as it should, you notice afterwards that your dog's fur is wet. This could be that you simply missed the skin with the needle or the needle has gone through the skin and out of the other side. Don't panic, pretty much everyone who gives regular injections to their pet has experienced this. If you suspect you have given a fur shot, it is important NOT to give another insulin dose as you don't know how much actually went in. By giving a second injection you are risking hypoglycaemia. Your dog may have high glucose levels until the next dose is due because of the fur shot but a day of hyperglycaemia isn't going to harm your dog whereas hypoglycaemia can kill. Just provide fresh water, wait until the next scheduled injection and continue as normal from there.

Why does my dog yelp when I give an injection?

There could be a number of reasons your dog is unhappy with the injections. It could be that he is picking up on your nervousness and fears. Try to make injection time as relaxed, calm and positive as possible. Offer a small treat and praise straight afterwards making the process a positive one. Cold insulin stings. Make sure to warm the insulin in the needle by either placing sideways in between your lips or under your armpit for a minute or two before injecting. Never warm the insulin in hot water or the microwave or in the vial. Inject with the bevel of the needle facing upwards. Many human diabetics say this is a more comfortable way of injecting. Make sure you tent the skin high and insert the needle at a 45 degree angle into the centre of the tent. You can watch how others do it on You Tube for guidance and if you would like to practice use an orange. If you hit a muscle or a nerve it will hurt your dog. Do not inject the insulin too slow or too fast, keep it nice and steady. Rotate the injection spot around the area you are injecting. If you continuously inject in the same spot, scar tissue will build up which becomes tender and sore and will cause poor insulin absorption. DO NOT rub the injection site after injecting as this will affect the absorption

rate of the insulin. Once the injections become a regular routine for both you and your dog, things will settle and you will both feel more comfortable with them. Injecting in the flank, side of the belly and chest will allow for better absorption of insulin compared to the scruff.

Can I reuse needles?

No, there are a few reasons this shouldn't be done. Syringes are made for one use only. They are covered in a coating that helps make the injection smooth and this is removed after first use. They blunt after first use and can make injections painful. There is also a risk of contamination of the insulin and infection with multiple use.

How should I store insulin?

Insulin should be kept between 2-8°C in the fridge at all times. Do not keep insulin in the door of the fridge. It is a good idea to keep a thermometer with the insulin to keep a check on the temperatures. Caninsulin have recently updated their advice and now recommend vetpens should also be kept in the fridge.

My vet says I mustn't shake the insulin, just gently roll. Is that right?

No. Caninsulin advise the following.

'Before administering, the insulin should be shaken thoroughly until a homogeneous, uniformly milky suspension is obtained. This applies to both the 10mL vial and 2.7 mL cartridges. Foam on the surface of the suspension formed during shaking should be allowed to disperse before the product is used and if required, the product should be gently mixed to maintain a homogeneous, uniformly milky suspension before use'.

It has been found that when the insulin vial is shaken before first use and rolled firmly before each use, glucose levels are more stable throughout use of the bottle. Shake the bottle the night before first use and then roll between your hands before each use to mix the insulin up. No need to go too gentle. By being consistent with the treatment of the insulin, you will reduce the chance of erratic glucose levels.

What should I do if my dog is sick after I have given insulin?

If your dog has been sick and he will eat it again, let him! As gross as that sounds to us, it's a sure way of knowing your dog has the right amount of food in his system to work with the insulin. If he is not willing to eat it, see if he will eat another meal. If he is refusing any further food, contact your vet for advice straight away.

Buying insulin and needles is expensive, how can I cut costs?

Because diabetes is a lifelong disease, it makes sense to bring the cost down as much as possible. There are a number of ways to do this, such as buying insulin and syringes online.

You can obtain a prescription from the vet with 3-6 months worth of insulin prescribed which you can buy safely from websites such as petdrugsonline or animeddirect. Syringes can be bought without prescription from sites such as vetuk. Your vet will charge you for the prescription and this charge varies from vet to vet.

****Use U-40 syringes only****

Going to the vets regularly for curves can work out very expensive too. You can instead buy a pet glucose monitor and run curves from your own home – one of the most used models is the AlphaTrak2 monitor (new from animed.co.uk or second hand from ebay). The strips can work out quite expensive if you use them often so generally it is suggested that the AlphaTrak2 strips are saved for running curves and instead purchasing Freestyle Lite Strips (cheapest from ebay) for performing spot checks and fasting level tests.

When is best to exercise my dog?

Exercise plays a big part in regulating a diabetic dog's glucose levels and with all things in a diabetic dog's daily life, it helps to be consistent. As with feeding, try and give the same amount of exercise at the same time of day. Most diabetic dog's experience a drop in glucose levels with exercise, some just a little, others quite drastically. Some dog's glucose levels on the other hand, rise with exercise. To know how exercise affects your dog, you should take a blood test before and after. In general, we should avoid exercise when our dogs are around their lowest levels of the day and avoid any strenuous or prolonged exercise unless we can test glucose levels before, during and after the exercise. It's always a good idea to take an emergency kit out with you. It can contain honey/ syrup, biscuits, crackers or a *xylitol free* peanut butter sandwich, just in case glucose levels drop too low whilst out.

Will my dog go blind?

It is said that around 75% of dogs with diabetes will develop cataracts and lose their sight within a year. This occurs when high glucose levels damage the blood vessels that nourish the retina. Dogs with a regular blood glucose level of 14mmol/L and over, are most at risk. If a dog loses it's sight or develops cataracts, it can be reversed with cataract surgery in most cases. The quicker it is dealt with, the better the chance the dog has of restoring full sight. Luckily, dogs don't rely on sight as a first sense. The majority of dogs that lose their sight adjust very quickly and continue to get around and lead as happy a life as they did before. Speak to your vet if you notice any cloudiness appear in your dog's eyes. Diabetic dogs can also suffer from dry eye and glaucoma. If you notice any changes in your dog's eyes then speak to your vet straight away.

What is the expected lifespan for a diabetic dog?

With the correct care and insulin therapy, a diabetic dog has the same expected life span as a non-diabetic dog.

Why is my dog so hungry all the time?

Another symptom of high glucose levels is uncontrollable hunger. When glucose levels are high, the body no longer carries converted glucose to the cells for energy so your dog will still be feeling hungry regardless of the amount of food he is eating. Once your dog is receiving insulin and the glucose levels in the blood reduce, the hunger feelings will subside. We mustn't overfeed in hope this will stop the hunger as it will raise glucose levels even higher causing further hunger.

My dog won't gain weight, what is happening?

Regardless of how much food your dog consumes, until his glucose levels are under control, the body will continue to use existing fat and muscle for energy instead of the food eaten, causing weight loss. If your dog is still losing weight even though his glucose levels are stable, check that you are giving the correct amount of calories for his ideal weight and check the fibre content in his diet. With too much fibre in the diet, your dog may continue to lose weight even when regulated. If you have any concern about your dog's weight, speak to your vet.

My dog is continuing to drink lots and peeing in the house?

High levels of glucose in the bloodstream causes dehydration and your dog will drink lots of water due to feeling uncontrollable thirst. This then leads to excessive urination. Your dog has no control over this and water should never be withheld. As soon as your dog's glucose levels start to come down with insulin therapy, the excessive thirst and urination should stop. If your dog continues to urinate in the house, you should have him checked for further problems such as urinary tract infections, kidney problems and Cushings Disease

My girl has very high levels of blood glucose during her season, can spaying her help?

Yes. When a bitch goes into heat, the production of progesterone in the body will result in instability of glucose levels. Spaying should be carried out as soon as possible before your dog experiences another heat. Once a female is spayed, she will usually need less insulin. Very occasionally, if spayed quick enough, diabetes may be reversed.

Finally:

Don't be afraid to ask your vet questions such as

- * What's their knowledge/ experience of diabetes
- * will they write out a prescription or price match insulin.

Keep asking questions.

Don't be afraid to move vets if you're not happy as not all vets are as comfortable with diabetic dogs as others.

Also, there are quite a few people in the breed who are happy to help with questions on diabetes, for example, Val Freer and myself as well as others.