Ferrets

Ferrets are inquisitive, lively and charming little creatures that have captured the hearts of thousands of people around the world. They have an average lifespan of five to seven years with the current record being 14 years. The scientific name *Mustela purorious furo* means "little smelly thief". Ferrets are the domesticated form of either the Eastern or Western European polecat. They have been domesticated since at least 300 BC and were originally used for rodent control and to hunt rabbits. The majority of ferrets in the world today are kept as pets either in the house or in outdoor enclosures.

We will discuss the general care requirements of the ferret as well as some of the diseases you should be aware of. There are also several fine books available on the subject of ferret care.

Diet

Ferrets are strict carnivores, meaning they are designed to eat whole prey items, which includes all parts of the killed animal. The only nonmeat items they might encounter in their diet would be in the stomach and intestinal tract of their prey, where it is partially digested. This might include small amounts of grains, fruits and vegetables. Ferrets have a very short gastrointestinal (GI) tract and the flora (the organisms living in the GI tract) are very simple, unlike the flora of animals that eat more vegetation. It takes about 3 to 4 hours for food to go from one end to the other and thus they absorb food rather inefficiently. Ferrets tend to eat several smaller meals and carry any excess to their dens to eat later. Did you ever have a ferret that took food and tucked it away in the corner of the cage, or a piece of furniture? Because of the short GI tract and the poor absorption of nutrients, ferrets require a diet that is highly concentrated with FAT as the main source of calories (energy) and highly digestible MEAT-BASED PROTEIN. This would match the basic composition of a prey animal not excluding the essential vitamins and minerals it also contains. Ferrets should never be fed carbohydrates (such as vegetable, fruit or grains) as the main source of energy in the diet. Ferrets cannot digest fiber, as is found in some vegetable and fruit sources. If there is a significant amount of fiber in the diet it serves to lower the nutritional value of the food.

As mentioned, ferrets need a highly digestible meat-based protein in the diet. Vegetable protein is poorly utilized. In the presence of excess vegetable protein the ferret can suffer from such diseases as bladder stones, poor coat and skin quality, eosinophilic gastroenteritis (wasting, diarrhea, and ulcerations of the skin) poor growth of kits and decreased reproduction. Dog food and vegetarian-type pet foods are completely inappropriate for use in ferrets because of the high level of vegetable protein and fiber. The bottom line is that ferrets use fat for energy not carbohydrates and they need a highly digestible meat-based protein not vegetable protein.

Another concern regarding the feeding of high carbohydrate foods to ferrets is the stress that may be created in the beta cells of the pancreas. Unfortunately, insulinoma, which is a cancer of the beta cells, is extremely common in ferrets over two years of age in the U.S. The main function of the beta cell is to respond to increases in glucose in the blood stream by producing insulin to control it. If normal beta cells are bombarded with higher than normal levels of glucose (which comes from carbohydrates) they can become hypertrophied (overactive) trying to keep up with insulin demand. If the high carbohydrate diet continues, the result may be a complete burnout of the cells, which is what happens when a pet or a person develops diet-induced diabetes.

However, another possibility is that instead of the cells burning out, they go from hypertrophy to neoplasia (cancer). Neoplasia is an abnormal growth of cells and can be preceded by a hyperplastic condition. I would like to stress that this exact mechanism has not been scientifically proven in ferrets to date, but the scenario is entirely within the realm of possibility. It has been disturbing to note that in the past in countries where ferrets were fed a raw carnivore-type diet insulinoma was a rare occurrence but now in these same countries where processed diets

are becoming popular, cases of insulinoma are on the rise. Regardless, do we need to be feeding our ferrets diets laced with inappropriate materials?

The most appropriate diet for a ferret would be whole prey foods such as rats, mice or chicks. However, we realize that the average American feels squeamish or downright distressed by the thought of feeding these foods. However, owners of carnivorous reptiles, such as snakes, must feed these prey foods routinely, as there is no alternative for these reptile pets.

The next best choice to feeding a whole prey diet is to feed a balanced raw carnivore diet. There are more and more of these diets available in either freeze-dried or frozen form as pet food companies realize that heat processing the food and making little baked kibbles may not be the answer. Several of the fresh, frozen or freeze-dried carnivore diets have been successfully used in ferrets. Our current recommendation is the Archetype Diet by Wysong. It is cold-processed, contains beef, lamb and chicken meat products, is well accepted and comes in small chunks so it is easy to feed. In general, you should look for diets that they are made from meat suitable for human consumption (preferably organic) containing all the parts of the animal (organ meat, muscle, fat and bone), a high level of fat and containing no grain or grain products, sweeteners or chemical preservatives. Do not use diets designed for dogs that contain vegetables and grains. Now we come to dry, processed ferret diets, the very diet most veterinarians, ourselves included, have used for years. Although there have been tremendous strides made in the quality of dry ferret diets in the last 25 years, we have yet to see one that we believe is completely appropriate for ferrets. Let's take a look at the composition of these diets and compare that to what we know of ferret nutrition. We have discussed that ferrets are carnivores and need a high protein, high fat diet with minimal carbohydrates. To use numbers, a dry ferret diet should contain at least 30 – 40 % crude protein and 15 –20% fat. The protein should be of animal origin and highly digestible. Unfortunately, pet food labels do not indicate digestibility of the components and the protein percent you read may contain both animal and plant sources of protein. In addition, grains, such as corn, wheat or rice, are used not only to increase protein but as a "filler" and as a means of binding the final product together. Ingredients on a pet food label are given in order of their amount in the diet, starting with the largest.

For ferrets, the first three ingredients should be meat-based. Processed dry foods are heated during production and in the process nutrients can be destroyed or altered and then have to be replaced artificially. In addition, other additives may be used to keep the food from spoiling. To add insult to injury, several of the diets have dried fruits and vegetables in them. Ferrets do not need these items and in addition the dried form can make it nearly impossible for the ferret to process. We have already had one case of a ferret that needed emergency surgery to remove a piece of dried carrot blocking his intestine that he consumed in a "ferret diet". Clearly, these diets are packaged to appeal to human consumers and may have little to do with appropriate ferret nutrition.

The worst examples of processed diets are the ferret treat foods. Nine out of ten ferret-specific treat foods we examined had no meat products whatsoever and were comprised entirely of sweeteners and grains, with some fruits and vegetables thrown in. This is not only not healthy it is downright dangerous. In addition, people who use treats often use too many because it is emotionally appealing to watch a ferret enjoy a snack. So if the pet enjoys one treat why not give him five or six? In an animal with such a small body size, five or six treats might make up a good portion of his food for the day. Of course ferrets love the treats because they are attracted to sweets, but that does not mean it is good for them? Many people like chocolate, but if they ate chocolate as 25% of their diet, they would have some serious health problems including diabetes! Again, the packaging is for the human and as long as we keep buying it, companies will keep making it.

If you decide to make a change, you may find that adult ferrets can be very particular and will resist change. This is because ferrets develop most of their taste preferences by four months of age but they will change if given no choice. We do not believe that it is necessary to "wean" a ferret off of a less digestible and gradually introduce him to a more digestible diet. We just change "cold turkey".

If you keep offering the old diet, there may never be a change to the new diet because they will go back to the original diet. It will probably be necessary to let your pet get hungry before he/she makes a change. Temporarily coating a new food with a fatty acid supplement or vegetable or fish oil as an enticement may help. However, be aware that ferrets that have insulinomas should not be fasted for more than 6 hours. These little guys may take a bit more time to change over the diet. If your ferret is currently being treated for any illness, consult your veterinarian first before making any changes.

Supplements

Ferrets do not need supplements of any kind if they being fed a balanced raw, freeze-dried or whole prey diet. If the ferret is being fed a high quality dry ferret diet, it is unlikely he/she will need routine supplements.

• Fatty Acid Supplements – Occasionally ferrets can develop a dry haircoat or dry skin and may benefit from the use of an oral fatty acid supplement. Coat or skin dryness can be due to a lack of sufficient fat in the diet (seen with some dry diets) or a very dry environment. However, overuse of fatty acid supplements can lead to obesity. Dry itchy skin can also be a sign of adrenal disease. Please consult your veterinarian if your ferret for the proper use of a fatty acid supplement.

• Treat Foods - Humans, not ferrets, have an emotional need for treat foods, so it is not necessary to feed ferrets any treats. But if you must give a treat, how about a nice piece of raw liver or heart, a bit of raw muscle meat or raw egg? Cooked meat or egg products can be given, but they are more difficult to digest than the raw form. Dog or cat treats that are composed of freeze dried muscle or organ meat are appropriate to use. Also pieces of a freeze-dried carnivore diet can also be offered in the dry form. As mentioned, most commercial ferret treats are completely inappropriate and actually can create a health risk. Please read labels before you feed a commercial product to your pet. Avoid getting your pet hooked on any high carbohydrate treat, which includes cookies, breads, crackers, cereal, ice cream and cake. These foods can potentially lead to disease of the pancreas. Use raw fruit or vegetable treats very sparingly and cut them into pieces 1/4"sqarre or smaller. If these high fiber treats are overfed or given in pieces that are too large, it could result in serious health problems.

• Hairball Laxative – Hairball laxatives are generally composed of a petroleum product such as Vaseline and a sweetener such as molasses. It would be best if we could avoid using sweeteners in the ferret's diet for reasons already mentioned under the general diet section. However, hairballs do develop in some ferrets over one year of age and this is most likely related to a diet that does not contain the normal bone, skin and fur of a prey animal that would help to move the ferrets own hair through the intestinal tract. Since most ferrets are not eating a whole prey diet, it may be beneficial to provide some sort of lubricating agent to help remove the hair from the stomach before it forms a compact mass. Try using only Vaseline, thereby avoiding the sweetener in hairball products. You can put a pea-sized amount on the ferret's food every third day. If that doesn't work, try putting the Vaseline on the ferret's front paw and he/she will naturally lick it off to keep clean. You can try to flavor the Vaseline with an oily substance such as fatty acid supplement, fish oil or vegetable oil and feed it off a spoon. It may be difficult to mix the Vaseline and oil together.

Environment

Caging and Exercise – Ferrets should not be caged 24 hours a day. Like all animals they need exercise to develop

strong bones and muscles as well as for healthy mental activity. Ferrets have the physiology of a predatory hunter and will play intensely for an hour or so and then sleep deeply for several hours.

Although ferrets are nocturnal by nature, they will adjust their activity schedule to yours without much fuss. The home cage should be a minimum size of 24"x24" x18" high for up to two ferrets. The cage can be multilevel, but avoid steep ramps because ferrets are not natural climbers and could fall and injure themselves. Aquariums are not suitable cages for ferrets because of inadequate air circulation. Make sure the cage is made of a material that will be easy to clean and deodorize and is indestructible to the ferret digging in the corners. The cage floor can be solid, but should waterproof and easy to clean or made of wire mesh with squares no larger than 1/4" to prevent foot injuries. Ferrets should be allowed in a supervised, ferret-proofed exercise area a minimum of two hours a day. This exercise period can be all at once or divided up into two or three play periods. Ferrets in the wild would spend a good deal of time in burrows underground, eating, sleeping and hunting. Think like a ferret, get down on your hands and knees and protect your pet from areas that might be attractive to him/her to dig or burrow into. Make sure you block off all escape routes and remove toxic substances such as plants, household cleaners, insecticides and rodenticides. Protect the carpeting from digging with heavy plastic carpet protectors. Keep your pet from burrowing into the bottom of your furniture or mattresses by covering these areas with a solid piece of thin plywood or Plexiglas. The burrowing is not only damaging to the furniture, but the ferret can eat the foam rubber inside and develop a fatal intestinal obstruction. Recliner chairs should be removed because ferrets like to climb into the chairs to sleep and then when the chair is moved, the ferret can be crushed.

Sleeping Area – In the wild, ferrets would sleep in a dark, warm, dry nest underground. We need to simulate this same environment by providing sleeping material in which a ferret can feel safe. A sleeping area can be as simple as a soft towel, old shirt or cut off trouser leg or blouse sleeve. There are now a wide variety of sleeping paraphernalia for ferrets sold at pet stores such as cloth tubes, tents and hammocks. Occasionally a ferret will chew on cloth, but this is usually baby behavior and most ferrets grow out of it. If your pet does chew on cloth, remove the item from the cage and use a small cardboard or wooden box with clean straw or hay for a sleeping area. After the ferret matures try the cloth sleeping materials again.

Litter Box – Ferrets can be litter box trained about 85% of the time. A small, low-sided box should be placed in the toilet area your pet has already used in the cage or exercise area. Do not use clay or clumping kitty litter in the box because ferrets like to burrow and play in the clean litter and the dust from the clay is damaging to the fur. Use a thin layer of pelleted litter, which is not only cleaner but also more absorbent. It is also non-toxic if swallowed and compostable in the garden. Ferrets back up to a vertical surface to defecate and urinate, so make sure the litter material does not come to the top of the box or all the waste material will drop over the side! Ferrets do not cover up their waste so it will be necessary to change the litter material several times a week to minimize stool odor. If the ferret is allowed to exercise over a large area of the house it will be necessary to place litter boxes in several locations. When ferrets need to "go" they will not travel far to take care of the situation!

Toys – Never give your pet ferret any latex or foam rubber toys!!! Ferrets like to chew on and then swallow these products and the result can be a fatal intestinal obstruction. Make sure to remove any access to foam or latex rubber items in your home such as stereo speakers, headphones, rubber soled shoes, pipe insulation, rubber bands and rubber dog, cat or baby toys. As mentioned under Cages and Exercise, prevent access to the underside of furniture and mattresses because these are also sources of foam rubber.

More appropriate toys are those that simulate the ferrets need for burrows or their attraction to hunting. Appropriate tunnel-type toys would include large cardboard mailing tubes, dryer hose, paper bags and PVC pipe. Toys that simulate moving prey include ping pong balls, small metal cans, golf balls, and small cloth baby toys or

cloth cat toys on springs that hang. Do not use any cloth toys if your ferret shows an interest in chewing them. but this is usually baby behavior and cloth is not a problem for adults. Remove buttons and eyes from any cloth baby toys.

Grooming and Handling

Grooming

In general, ferrets need very little grooming. Ferrets do not need to be bathed and overbathing can actually cause dryness of the haircoat and skin. Ferrets have a natural musky odor to the skin which is part of "who they are" and will never be completely eliminated by constant bathing. If the odor is a problem, to be blunt, you should consider getting a different species of pet because it is unfair to the ferret to not accept this part of his/her physiology so suit yourself.

Not only are ferrets not meant to smell like pine trees or pineapples, but also such intense odor changes are most likely disturbing to the ferret itself. Unneutered ferrets have a very strong odor to not only the skin and haircoat, but also to the urine during the times they are reproductively active. This is a necessary part of their reproductive physiology. However, most people find this odor a bit overpowering and will choose to neuter their pet to prevent it. Ferrets that are not going to be used for breeding should be neutered anyway to prevent aggressive behavior in males and fatal anemia in females.

Ferrets tend to have a heavy production of reddish brown wax in their ears normally. You should avoid the urge to continuously remove this wax as it has a protective function. In addition, continually putting cotton-tipped applicators into the ear may inadvertently push wax into the ear canal. Once you have had your ferret checked by a veterinarian to ensure it is free of disease, then let the ferret clean its own ears by shaking its head and scratching from time to time.

Ferret nails can become sharp and may become entangled in carpeting or cloth. It will be necessary to trim your pet's nails every six to eight weeks to keep them in shape. Have an experienced person show you how to trim the nail the first time. It is not terribly difficult, especially if you use a treat such as a fatty acid supplement to distract them from the procedure!

Handling

Domestic ferrets are generally easy to handle and are not aggressive little creatures. However, like all pets, they can be come frightened and their first response may be to strike out and protect themselves with their teeth. We do not recommend keeping ferrets in households with children under six years of age because of the possibility that the child may inadvertently harm the ferret and an unfortunate accident may result. By the way, this advice applies to cats and dogs as well. In addition, be a responsible pet owner and never put a pet in a threatening situation where it will be forced to defend itself. You are ultimately responsible for all your pet's actions.

Ferrets have poor eyesight and should never be placed in a situation where they might fall over the edge of a high surface. In addition, do not hold ferrets near your face, especially if you are not familiar with his/her behavior yet because a nose can look like a really neat toy to grab onto if it comes towards the ferret suddenly. Most of the time you need only pick up your ferret and hold him/her in your arms to move him/her from place to place. Sometimes it is useful to scruff your ferret in order to keep him/her still for certain procedures like giving medications, checking the ears, eyes or mouth, or for bathing. To scruff a ferret, grab the skin along the back of the neck firmly and then hold the pet up so that the hind feet cannot touch the ground. Stroke the ferret's underside from top to bottom, which will relax your pet further. Most ferrets become very relaxed with this restraint method. Occasionally a younger ferret or a very frightened animal will object and you will not be able to use this

hold.

Vaccinations and Routine Vet Care

Canine Distemper
Canine distemper (CD) is a contagious disease caused by a large RNA paramyxovirus (Canine Distemper Virus or CDV). CDV can be transmitted to ferrets directly from infected animals including dogs, foxes, raccoons and other ferrets, through contact with infected material such as shoes or clothing. You can bring CDV home if you are in contact with infected material in places such as the woods, a pet store or a breeding facility. Using a CD vaccine that is not approved for use in ferrets can also transmit CDV.

The current recommendation is to have your pet vaccinated for CDV annually. There is evidence that the vaccination may last up to three years in some animals, but an antibody titer would have to be performed to determine if this was the case for each pet. Ferrets at high risk such as those going to ferret shows, those with exposure to other species of CDV susceptible animals, those that travel and those in a breeding program where new ferrets are frequently added should be vaccinated annually. Baby ferrets receive a series of vaccinations with the completion at 14 weeks of age. Adult ferrets that have never had CDV vaccination will initially receive a series of two boosters, then one annually thereafter.

Rabies
Rabies is caused by a virus that can affect many species of animals including man. The virus is shed in the saliva and transmission is usually through a bite wound. It can also be spread through contact of infected saliva with a mucous membrane or any open wound. Since rabies is a human health issue, there are strict local and state regulations that govern the vaccination of most domestic pets for rabies. In some areas of the country, if a ferret bites a human and it was not vaccinated for rabies, the ferret will be confiscated and destroyed so the brain can be examined for the rabies virus. This is the law and your lack of knowledge about it will not protect you or your pet. Please find out what the laws are regarding rabies vaccination and ferret bites in your area before there is a problem. It does not matter if your ferret was never exposed to rabies, the law will prevail. There is at least one approved annual vaccination for rabies in ferrets but there is no approved three-year vaccine. Some areas require the purchase of a rabies tag, which your pet does not have to wear, but you need to keep for proof of vaccination. The first vaccination for rabies can be given anytime after the ferret is three months of age and annually thereafter.

The following list represents high-risk situations where ferrets absolutely should be vaccinated for rabies annually:

• Ferrets living where rabies vaccination is legally required – This one is obvious! • Ferrets living outdoors – This includes those on taken on camping trips or walked in wooded areas.

• Ferrets with exposure to children – Very young or pet-inexperienced children can inadvertently frighten or disturb a ferret, which increases the likelihood of a bite.

• Ferrets that will be used in public demonstrations or attend ferret shows – When people handle ferrets and are afraid or unfamiliar with them, they may startle the ferret and increase the possibility of a bite.

• Ferrets that are being boarded – This is a protection for your pet should he/she inadvertently bite anyone while you were not there to supervise.

Routine Veterinary Care
Ferrets up to 2 years of age – Ferrets up to two year of age need annual physical examinations and annual vaccinations for canine distemper and rabies as described above. If your ferret lives in a an area of the country where heartworm disease is a problem and he/she has access to the outdoors, then your pet should also have an annual heartworm check performed. In addition, your ferret should receive heartworm preventative medication during the heartworm season.

Ferrets over 2 years of age – Unfortunately there are a number of diseases that can plague the ferret after two years of age including adrenal disease, insulinoma, skin cancer and heart disease. In order to manage these problems effectively it is essential to strive for early detection. For this reason we recommend ferrets over two years of age have a physical examination performed at least every six months. For ferrets up to five years of age, we recommend annual blood tests and x-rays to further investigate disease potential. Ferrets over 5 years of age should have these diagnostic tests performed every six months. Routine vaccinations as well as heartworm testing and medication should continue as before. Any additional tests and procedures can be discussed with your veterinarian.

Medical Problems

The following is an overview of just a few of the medical problems that can afflict the pet ferret. Many of these conditions are seen in the ferret over two years of age, which is why it is so important to have your pet checked by a veterinarian more than once a year as he/she ages. Be a responsible pet owner and educate yourself through more than one source and discuss any conflicting or new information you may obtain with your veterinarian. Together, you and your veterinarian can form a valuable team to provide the best possible care for you pet.

Emergencies
If you feel that you have an emergency situation tell the veterinary office when you call that you feel this is an emergency. It can be difficult for the veterinary staff to know that a situation is an emergency if you are unclear on basic information or if you don't specifically say that you think it is an emergency. Be clear and concise with pertinent information, which includes:

- The condition of the ferret at this moment (be as precise as possible)
- How long the condition has been present
- Ideas you have on why you think your pet is ill

It is helpful to jot down some notes about your pet before calling the veterinary office so you don't forget important information.

Human Influenza
Ferrets are highly susceptible to the human influenza virus or the "flu". They do not get common colds, which is caused by another set of viruses. Ferrets can get the flu from humans and humans can contract the flu from ferrets through contact with respiratory secretions. Adult ferrets develop a watery discharge from the eyes and nose, sneezing, coughing and a fluctuating fever. Occasionally they also develop diarrhea. They feel miserable for a few days but usually recover uneventfully. Baby ferrets can be more severely affected, so avoid handling baby ferrets if you have the flu. Your veterinarian may prescribe medications to make your pet more comfortable, but antibiotics are not appropriate for this disease as it is viral, not bacterial.

Fatal Anemia of Female Ferrets
This disease is caused when an unneutered female ferret goes into estrus or "heat" and does not get bred. She can stay in this state for several months during which time her estrogen levels remain quite high. The estrogen can eventually stop the production of blood cells in the bone marrow thereby leading to a severe anemia and ultimately death. The prevention for this disease is to have your female ferret spayed. Most American ferrets are already neutered when they are purchased so we do not see this disease as frequently as we used to.

Fleas
Ferrets are susceptible to fleas, particularly if they are kept outdoors, but can also be infested if other pets in the house bring fleas inside. It is best to avoid the use of insecticides on your pet and there are safer alternatives that can be used once a month on the coat during the flea season. It is also vital to clean up the environment to completely eliminate the flea problem.

Heartworm Disease
Ferrets, like dogs and cats, are susceptible to infestation by the heartworm. Mosquitoes transmit the larvae of this parasite when they feed on a host. The adult worms live in the heart of the pet and in a ferret, the heart is so small that the presence of even one or two worms could be fatal. If you live in a heartworm prevalent area of the country, particularly if your pet is living outdoors or you have mosquitoes regularly invading your home, you should have your ferret checked annually for this disease and use heartworm preventive medication. There are a number of alternatives for heartworm medication, which you can discuss with your veterinarian.

Foreign Bodies in the Stomach or Intestine
Ferrets, particularly under a year of age, love to eat foam and latex rubber, which can become lodged in the intestine or stomach. In addition, ferrets over one year of age can develop large masses of hair in the stomach, which also can cause an obstruction. All of these situations are dangerous and usually require surgery to remove the foreign material. Signs of a foreign body obstruction includes lethargy, extreme dehydration, vomiting (but they often don't), lack of stools, painful abdomen, seizures and death. The best preventative for this problem is to adequately ferret-proof the environment as described previously.

Epizootic Catarrhal Enteritis (ECE)
This is the name given to "green slime disease" that has affected ferrets, particularly in shelters, since 1993. The current view is that this is a disease caused by a coronavirus. Fortunately, most ferrets recover uneventfully from ECE, however some, particularly older ferrets or those with other disease, can be severely affected. ECE spreads rapidly and ferrets exposed will exhibit signs of disease within 48 to 72 hours. ECE can result in both inflammation of the GI tract as well as inflammation of the liver. The signs of illness initially can range from vomiting and a soft, green, mucous-coated stool to bloody diarrhea. Recovered ferrets and some unaffected ferrets may be carriers. Young ferrets usually recover from ECE rapidly, but older ferrets may lose significant body condition and continue wasting once the diarrhea is gone. Treatment depends on the severity of the illness and can include intestinal coating agents or antacids, antidiarrheal drugs, antibiotics, injectable fluids and dietary changes.

Heart Disease
Ferrets over two years of age can develop heart disease. The most common type seen is cardiomyopathy or heart muscle disease. We do not know why ferrets develop this problem, however it could be genetic. The signs of the disease are weakness, particularly after exercise, and an overall loss of energy. Ferrets usually don't cough, but may have more rapid breathing. The disease can be treated with a combination of heart medications.

Skin Tumors
As ferrets age they become more prone to develop "lumps and bumps" on their skin. Most of these lumps are neoplasms or tumors. Fortunately they are usually benign, but it is best to have them removed nonetheless. The longer you wait to have them removed, the greater the possibility for complications. ADRENAL DISEASE – This is a very common disease of ferrets over two years of age. It is either a neoplasia (cancer) or hyperplasia (overactivity) of the adrenal glands, which are located near the top of the kidneys. These glands are part of the endocrine or hormone producing system of the body. For unknown reasons in ferrets the adrenal glands become diseased and not only can enlarge and cause pressure on surrounding tissues, such as the kidney and vena cava, but also produce excessive amounts of androgens or sex hormones. This overproduction of hormones results in a variety of signs including a symmetrical loss of hair, increase in body odor, enlargement of the vulva in spayed females, return of the mating or aggressive urge in neutered males, dry brittle haircoat and itchy skin. In addition, some males can develop an enlargement of the prostate gland, which constricts urinary outflow. These ferrets have difficulty urinating and eventually may not be able to urinate at all. The treatment for adrenal disease is usually a combination of surgery to remove a portion or all of the adrenal glands and medical therapy.

Insulinoma

This is neoplasm of the beta cells in the pancreas. This disease often occurs at the same time as adrenal disease and is just as common. The pancreas, like the adrenal glands, is also a part of the endocrine or hormone producing system. The beta cells produce insulin, which acts to move glucose from the bloodstream into the cells. With insulinoma, there is an excessive production of insulin, which drives the glucose out of the bloodstream too quickly. This leaves the brain and muscles with an insufficient supply of "food" which results in weakness, nausea (exhibited by excess saliva production and pawing at the mouth) and eventually seizures. These signs are seen intermittently because the body is constantly trying to replace the glucose and early in the disease it can successfully do so for periods of time. The signs may disappear on their own. As the disease progresses, however, the ferret has longer and more frequent periods of abnormal behavior. The treatment for this disease is usually surgery to remove as much of the cancer as possible combined with livelong medication. It is critical to remove as much carbohydrate from the diet as possible as well because carbohydrates will only aggravate the condition.

Other Neoplasias

The reason is unknown, but ferrets are prone to a number of other neoplasias. Lymphosarcoma is a cancer of the lymphatic system and is the one cancer that can affect ferrets of any age. It can be treated in many cases with chemotherapy, but the success varies with each case. Other organs that can be affected by neoplasia include liver, kidneys, spleen, anal glands, ovaries, testicles, gums, bones and lungs. The treatment is dependent on the neoplasm and the condition of the pet.