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## **TO NEUTER OR NOT TO NEUTER.....THAT IS THE QUESTION**

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In this issue I would like to discuss the neutering of pet rabbits. The word "neuter" refers to the removal of the reproductive organs of either a male or a female of a species, although people frequently refer to the surgery in a female as a "spay". The 'scientific' terminology for neutering in the male is castration and in the female is ovariectomy. Let's now take a look at the whys and wherefores of this important issue.

### **REASONS FOR NEUTERING RABBITS**

1. Prevention of Pregnancy - This is the most common reason that rabbits are neutered, particularly if there are both male and female rabbits living together in a household. There are certainly enough rabbits in the world and too many are neglected or abandoned. One should not consider breeding these pets just for "fun" or "education".
2. Prevention of Uterine Cancer - This is the most compelling medical reason to neuter female rabbits. In some rabbit populations the rate of malignant uterine cancer (specifically called uterine adenocarcinoma) can approach 80% of all the females. It is believed that the incidence may be disease is mammary dysplasia or cystic mammary glands. This is a benign condition, where the mammary glands fill with a cystic material. It can be uncomfortable to the pet. Neutering a female rabbit before two years of age will prevent both of these diseases.
6. Prevention of Aggressive Behavior - Both male and female rabbits can display aggressive behavior when they reach sexual maturity. Many rabbits are sweet and easy to handle as little babies, but when the teenage years hit...watch out! They can turn (it seems like overnight) into little Frankensteins! They don't want to be touched or picked up and they act like they want to destroy everything in site. This is their way of learning to protect themselves, their territory and potential future families and make a "niche" for themselves in the big wide rabbit world. However, they can often take out their aggression on YOU or their cagemates. There may be more biting, striking, lunging and chasing. It is best to neuter just before or shortly after sexual maturity to keep this behavior to a minimum.
7. Prevention of Urine Spraying - Both male and female rabbits can spray urine on vertical surfaces to mark their territory. Intact mature males do this at least 10 times more frequently than females. In addition, sexually mature male rabbit urine can develop a very strong odor, which is unpleasant to many humans. If this behavior is allowed to continue for months or certainly years, it may be impossible to retrain the pet, if it is neutered at a later date, to learn to use the litter box again. Therefore, it is best to "nip it in the bud" and get the little guys neutered just prior to shortly after sexual maturity.
8. Prevention of Testicular Disease - Disease of the testicle is rare in the male rabbit, but it can occur. Most commonly we see abscesses (often from bite wounds from other rabbits), hematomas (blood filled areas) and cancers.

### **AGE TO NEUTER**

The best age to neuter is shortly after sexual maturity. Depending on the breed, this could range from 4 to 6 months and with giant breeds up to possibly 9 months. If the rabbit is neutered much younger than 4 months of age, not only is the surgery more difficult due to the immature condition of the reproductive organs (in males the testicles might not even be descended into the scrotal sacs prior to three months) but we do not know what the long term effect is on the endocrine system of the body. The reproductive organs are part of an interconnecting system of hormone producing organs including the thyroid, pituitary, pancreas and adrenal. If we remove a large "chunk" of the endocrine system before it is done developing, we suspect there could be long-term effects on the health of the rabbit. This has been studied in mice

and rats where ill effects have been found with early neutering, but as yet has not been researched in rabbits. For the pet rabbit, there is really no good reason to neuter your rabbit before it is mature.

You should have your rabbit examined by a veterinarian who has experience with rabbits to make sure your pet is in good condition and ready for neutering. Sexual maturity can be gauged a number of ways including the presence of the testicles in the scrotal sacs, a well developed and possibly swollen vulva (this has to be checked by "pushing" the vulvar tissue out by pressure placed above it), a mature body condition and by behavioral changes such as urine spraying and increased aggression. Your veterinarian may recommend some simple tests prior to surgery, particularly if your pet is older or has had other medical problems. I do not recommend performing routine neutering procedures on obese animals or those with other disease. The weight should be reduced and other disease managed prior to having a major surgical procedure performed.

## WHAT HAPPENS AT NEUTERING

When a male rabbit is castrated, the testicles are completely removed. There may either be one incision made in front of the testicles, in the area of the lower abdomen through which they are both removed, or related to the genetic makeup of the rabbit. Since we usually don't know the genetic background of most of our rabbits, it is best to have the surgery done as a preventative for this cancer. Uterine adenocarcinoma can spread rapidly to other organs of the body such as the liver, lungs and even the skin and it is not treatable once it reaches this point. We see many cases of this disease each year and sadly these rabbits could have avoided this problem. Rabbits under two years of age rarely develop this disease so it is best to get your little one spayed before this age.

3. Prevention of Other Uterine Disease - Although cancer is the most common disease of the rabbit uterus we see many cases a year of other uterine disease such as pyometra (infected uterus full of pus), uterine aneurysm (uterus full of blood) and endometritis (inflamed uterine lining). Like uterine cancer, these conditions are all more common in female rabbits over two years of age.

4. Prevention of False Pregnancies - Female rabbits can go into a hormonal state triggered by their ovaries where they think they are pregnant but they are not. Although this is not medically harmful, it can be very stressful for the rabbit who goes through all the motions of being pregnant including nest building, milk production and aggressive protection of its territory. This aggression can be taken out on the caretakers and cagemates and can make the pet very difficult to handle during this period. Some rabbits experiencing false pregnancy will develop a decreased appetite and have gastrointestinal disturbances as well.

5. Prevention of Mammary Gland (Breast) Disease - Breast cancer is not common in female rabbits, but when it occurs it can spread rapidly and be very difficult to treat. It is preventable if the pet is neutered before two years of age. It is interesting to note that the most common type of mammary cancer is a malignant form called mammary carcinoma and it is almost always associated with uterine cancer. The other common mammary gland disease may be one incision made over each scrotal sac. The incisions may be left open (perfectly acceptable if scrotal incisions are made) or closed with suture or surgical glue. The scrotal sacs may swell after surgery within 24 to 48 hours and by 7 to 10 days the swelling should be gone. The scrotal sacs will eventually shrink to be barely noticeable over time. It is important to note that neutered males should not be put with intact females for at least 3 weeks after neutering. Male rabbits can still have living sperm in the portion of the spermatic cord (vas deferens) which is still in place after surgery. These sperm can live for a couple of weeks. Testosterone blood levels drop slowly after neutering and male rabbits will still try to mate with female rabbits for weeks after the testicles are removed. After three weeks the sperm are dead and since no new sperm are being produced it is safe to put a male and female rabbit back together again.

When a female rabbit is neutered the ovaries, the oviducts, the uterus and often both cervixes are removed. Rabbits have a uterus that is made up of two long tubes with an ovary at one end and a cervix at the other. They have two cervixes unlike cats, dogs, humans and many other species. An incision is made approximately midabdomen and the uterus and associated structures are gently pulled out from the abdomen through this incision. The blood vessels supplying the uterus and ovaries are tied off with suture material and reproductive organs are removed. The incision is sutured with two to three layers of suture material. Since rabbits have incisors that are excellent at cutting through many materials we find it beneficial to bury final row of sutures under the skin so they are not accessible. In this way the rabbit has nothing to chew on or pull out. These sutures dissolve eventually over several weeks and there are no external sutures to remove. Some veterinarians use skin staples as the final closure which also work nicely in rabbits, particularly the larger breeds. Skin staples can't be chewed through like nylon suture or other more flexible materials.

It is important with any surgeries to check the surgical site at least once, and even better twice a day for any signs of unusual swelling, discharges or gapping of the wound. Many rabbits will be off feed for a day after surgery, but this should gradually return to normal over the next two to three days. In addition, some rabbits will have unusual stools for a day or two including soft stools, clumped stools, irregular shaped or small stools. If your rabbit is acting very uncomfortable, is not eating at all or is unwilling to move, you need to contact your veterinarian right away.

Your veterinarian may prescribe a pain medication for your pet postsurgically, particularly for females that may have had any complications at surgery or for those that are older.

After doing literally hundreds of these procedures over the years I find that the great majority of rabbits return to normal within 2 to 5 days and are none the worse for wear. The long term benefits of neutering far outweigh the temporary discomfort that might be felt.

I did not discuss anesthesia in this issue which is one of the main concerns with any surgical procedure in rabbits. This is a complex issue best left for an entire column. For now, let me say that if you are dealing with an experienced rabbit veterinarian, he or she will be familiar with the eccentricities of rabbit anesthesia and will know how to handle this issue with your pet.

We will discuss anesthesia in another issue.

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