

## **Caring for Marmosets**

Small animal veterinarians, especially those who treat birds, reptiles or other exotics, may occasionally be called upon to examine and treat unusual species of animals not often kept as pets. Some exotic animals are purchased for their uniqueness, with little thought given to how to care for them. As a veterinarian, it will be beneficial for you to know some basic information about the care of marmosets, as they are increasing in popularity as pets.

Marmosets are small, South American monkeys that are members of the callitrichid family. All are considered threatened in the wild, and many are endangered. Because of their appeal, people are interested in owning them as pets. Hand-raised, bottle-fed babies are quite charming, but with the onset of sexual maturity, they become unpredictable, aggressive and dangerous to humans - including their owner

## **Breeding and Care**

In the wild, callitrichids live in family groups consisting of a dominant female and a dominant male. The dominant female secretes a pheromone that suppresses ovulation in other females in the group. Callitrichids appear to have an estrous cycle as opposed to a menstrual cycle, as occurs in macaques. This cycle is approximately 15 days in most species. Callitrichids become sexually mature at approximately 16 to 25 months of age, however, copulation and masturbation may occur much earlier. The gestation period is approximately 150 days.

Marmosets usually have twins; triplets and quadruplets also occur. Goeldi's marmosets usually have singletons. If parents have not been raised in a family group, (if they have been hand-raised and bottle-fed), they will not have acquired parenting skills by participation in carrying and caring for siblings born after them and they may not have the necessary skills to successfully raise their offspring. However, after several birth cycles, hand-raised callitrichids may care for their young.

Breeders hand-raise marmosets in an effort to produce better pets. However, one must realize that these are wild animals and are not domesticated. Breeders remove infants from their parents for hand-rearing when they are between 3 and 10 days of age, so the infants can receive colostrum and milk for the antibodies. Infants are delicate and usually weigh between 28 and 35 grams at birth. They are born with eyes open, a full coat of fur, a mouthful of teeth, and extremely strong, muscular forearms for grasping the parents.

Babies cannot thermoregulate for the first two months. The father carries the infant the majority of the time, and the female usually only carries the infant to nurse it. The baby normally rides across the parent's neck and shoulders. A good indicator of whether the baby is healthy is observation of the tail. Marmoset babies hold their tails tightly against the parents' bodies. Again, if the tail is limp, the baby is in distress. This indicator also works to assess a baby being hand-fed.

Hand-raising a baby callitrichid requires an incredible amount of devotion, time and emotional energy. To simulate their natural lives, infants should be carried by their owners as much as possible for warmth and emotional security. Keeping a baby on a stuffed animal surrogate for extended periods of time is unnatural and cruel. Infants need the stimulation and affection afforded by constant contact.

If a baby must be placed for short periods of time on a surrogate, use an insulated soft-sided six-pack cooler, with a microwaveable soft heating pad under a stuffed animal. Do not use a regular plug-in type heating pad because if the baby crawls between the stuffed animal and the pad, it can quickly overheat and die.

Infants should be fed Enfamil human baby formula. Once a week, a drop of pediatric multi-vitamins should be mixed into the formula. Formula should be warmed to about 100 degrees Fahrenheit before feeding. Newborns should be fed every two hours around the clock and must be stimulated in the perineal area to urinate and defecate. Babies usually begin sleeping through the night when they are about two weeks old. Weaning occurs at about 8 to 10 weeks of age, but in the family group, the babies nurse until the next infants are born (usually six months after the previous birth).

## **Basic Needs**

Diet is important for callitrichids to remain healthy in captivity. Marmosets and tamarins are extremely intelligent and should be fed a rotating diet to prevent boredom. The base of the diet should be canned marmoset diet (Zupreem) supplemented with New World primate biscuits (Mazuri). Yogurt (live culture), raw peanuts, banana, chopped broccoli or carrot, cucumber, cooked yams, corn on the cob, apples, grapes, peaches, plums, eggplant,

celery, papaya, mango, cooked beans, raw string beans, cooked pasta, fruit ring breakfast cereal and cooked oatmeal can be fed daily.

Callitrichids relish sweets and may be treated to marshmallows, gummibears, cake, pudding, cheese, cooked chicken, turkey, cooked shrimp or other seafood, cooked beef and cookies. (In the wild, these monkeys are gummivores and consume saps and gums from trees). As a supplement, they should receive 1/2 of a 250 mg. chewable vitamin C tablet daily, as well as a drop of pediatric oral liquid vitamin (with vitamin D<sub>3</sub>) or a chewable children's vitamin daily. Nutrical can also be fed daily. It is a good idea to offer a calcium based antacid such as Tums, also.

Callitrichids like to sleep in a box where they feel secure. They prefer to sleep up high and like to have towels, blankets and stuffed animals to snuggle up to. Most go to sleep at sunset. They are active and require a cage large enough (3' by 3' by 4' would be adequate) for them to jump and play. Many owners allow their callitrichids to run free in the home.

These monkeys are not particularly messy animals and can be somewhat trained to defecate in a given area. Their urine is not very strong, and they tend to urinate frequently in many locations. They scent their areas by rubbing their perineums over everything: toys, food dishes, bedding, stuffed animals, furniture, rugs and caging.

They are intelligent and need stimulation. Interaction can be supplemented with toys, but if a callitrichid is kept singly as a pet, it will rely on the human family to become its family group.

## Health Concerns

Pet callitrichids should have annual physical exams and stool cultures. Feces should be examined for protozoa, such as *Giardia*. Blood work may be indicated. Humans with viral infections should not be allowed near marmosets and tamarins, as a cold could be deadly to a callitrichid. Childhood diseases like measles, chicken pox and mumps can also be fatal to small monkeys. If a monkey will be around children, it should be vaccinated for measles and tetanus.

Cold sores, caused by the Herpes virus, are extremely dangerous to marmosets and may cause a fatal encephalitis. Humans with HIV or other immune system suppressing diseases should not own primates.

Although tuberculosis is rare in New World primates, callitrichids can be tested for TB using the intradermal skin test. Fortunately, most dangerous viral zoonotic diseases are found in Old World species, such as the macaques, green monkeys and rhesus monkeys.

Diarrhea is the most frequently seen medical problem, with cause often multifactorial and often related to changes in the diet, stress, parasites and bacterial infections from *E.coli*, *Salmonella*, *Shigella*, *Klebsiella* and *Campylobacter*. Kaopectate (.25 cc PO QID) or Pepto-bismol (.2 cc PO QID) may help. Carafate has proven effective in treating nonresponsive diarrhea. Diarrhea may become serious, even life-threatening. Keflex pediatric oral suspension and oral Amoxiclax are accepted and palatable to marmosets. Blood may be drawn from the femoral vein using manual restraint or from the jugular vein. Catheters may be set in either of these veins as well.

Wasting Syndrome is a very frustrating problem with callitrichids. It is now suspected that this is caused by the pancreatic worm, *Trichosporura leptostoma*. The intermediate host of this worm is the cockroach. Many wild-caught marmosets will be infested with between 2-3 worms in the pancreas, however, in captivity, these worms may multiply to lethal levels. Strict sanitation and insect control are very important to prevent these worms from multiplying. The worms cause the pancreas to malfunction, resulting in diarrhea, malabsorption and malnutrition. Chronic diarrhea, weight loss, alopecia of the tail base and hind-leg paralysis may eventually progress to death. The worms shed eggs that may be detected in the stool only for a brief period of time, and after that, in experimentally infested marmosets, eggs are rarely, if ever, found in the stool. Although fecal parasite examinations are very important in any case of diarrhea or weight loss, if a veterinarian suspects pancreatic worms, then fenbendazole, administered at 50 mg/kg orally once daily for 14 days, should be given. However, if the pancreas has been severely damaged, support care, including supplemental pancreatic enzymes should be given with each meal. Although this worm is more common in marmosets, they can also occur in tamarins.

Two important viruses in callitrichids are Lymphochorionmeningitis and encephalomyocarditis. The rat and mouse are the host reservoirs for LCM, which causes anemia and hepatitis in affected monkeys. LCM may be seen in callitrichids kept in cities, apartment buildings or other areas where mice and rats occur. Transmission is

by aerosol route. Encephalomyocarditis may occur most frequently in zoos, and also has a suspected host of rats and mice. A third virus, callitrichid hepatitis, may also occur.

Toxoplasmosis occurs sporadically in callitrichids. Spirurid nematodes and thorny-headed worms can affect marmosets, and are carried by cockroaches and coprophagous beetles.

Also, lead poisoning may occur in marmosets kept in apartments and houses painted with lead-based paint.

Bites by callitrichids should always be considered serious. Wounds should be scrubbed with povidone iodine, then hydrogen peroxide. Owners who have been bitten should be encouraged to contact their physicians.

## **Restrictions**

A permit or license is not needed to own a marmoset or tamarin, however, a U.S.D.A. license is required to breed, exhibit or sell them. A prospective owner should inquire to ensure that the breeder or dealer selling monkeys has the necessary license. Disreputable dealers and breeders will sell primates to capitalize on profit opportunities. Anyone selling nonhuman primates without a license should be immediately reported to the U.S.D.A. Different states may have their own laws regarding ownership of non-human primates (NHPs). Also, counties may have their own laws that can supercede state laws regarding NHP ownership. It is always advisable for a prospective owner to ensure that owning a NHP is legal in the area in which they reside.

Marmosets and tamarins are beautiful, intelligent monkeys. Even so - unless a family has owned monkeys before - they should be discouraged from purchasing a callitrichid as a pet. Even with past experience, such a decision should not be undertaken lightly. If a client has decided to purchase a monkey, suggest they consider purchasing an unrelated pair and eventually breed them. That way they can enjoy the infants and juveniles, and when they outgrow their cuteness, they can contribute to conservation efforts.