



Care of Pregnant and Lactating Ferrets, and Neonatal Kits

Breeding and Pregnancy

Reproduction in the ferret is highly dependent on the photoperiod and the intensity of the light source. Female ferrets reach sexual maturity by approximately 4-8 months of age, and estrus is stimulated by exposure to photoperiods of 14-16 hours. Ferrets are induced ovulators, and they will remain in estrus until bred. Prolonged estrus can lead to serious health issues such as bone marrow suppression and can be fatal to the ferret. Ideally, ferrets should be bred approximately 2 weeks following first signs of estrus.

The gestation period of the ferret is 41-42 days with day 0 as the day of breeding. Implantation occurs at 12-13 days gestation. We recommend avoiding shipment of the animals during the time of implantation, and for the week following to avoid reabsorption. The optimal time to receive pregnant ferrets is between 20 and 27 days gestation. Shipping animals after the recommended gestation window can also be problematic as it can cause stress and an increased risk for complications that may include pregnancy toxemia from inappetence. Due to the potential complications that can arise when shipping too early or too late in gestation, we strongly discourage requests for animals with a gestation day before day 20 or after day 27.

Detection of Pregnancy

At Marshall BioResources, pregnancy is typically confirmed by abdominal palpation of the jill by around 3.5-4 weeks gestation. It can sometimes be possible to detect pregnancy by around 14 days gestation. Ultrasound examination may also be performed to detect embryonic vesicles if necessary or specifically requested.

The Importance of the Light Cycle

The normal breeding season for ferrets in the Northern Hemisphere is March-September. Breeding animals at Marshall BioResources are kept on a light cycle of 16 hours light:8 hours dark provided by both natural and artificial illumination. Upon receipt of pregnant females, a 16 hour photoperiod should be maintained throughout parturition and lactation. Standard 4-foot fluorescent bulbs are adequate for laboratory settings. Failure to preserve the photoperiod of pregnant jills may result in potentially fatal health issues, including inappetence with subsequent negative energy balance, and pregnancy toxemia.

Nutrition for Pregnant and Lactating Ferrets

The best possible nutrition should be provided to avoid a number of problems during pregnancy and lactation. The feed should have adequate fat content (minimum 15-20%) and good quality meat based protein (minimum 35-40%) to prevent pregnancy toxemia, especially in jills carrying large litters. In order to remain healthy, pregnant and lactating jills must be maintained with a high quality diet. Changes in diet can greatly affect the entire process, resulting in pregnancy toxemia or stillborn kits. Marshall BioResources will only guarantee pregnant ferrets that remain on Marshall Premium Ferret Diet, which has a guaranteed level of 38% protein and 18% fat.

As a supplement, the dry feed may also be softened with warm water to a slurry consistency, and approximately ½ to ⅓ cup of the mix offered to the jills. Combine 1 part Marshall Premium Ferret Diet with 3 parts warm water. This same softened feed should be fed to the kits beginning at 3-4 weeks of age. This will aid greatly in their transition to solid food, and should be fed in a dish or flat tray low enough for them to reach easily. Kits will begin to eat the dry diet when they are about 6 weeks old. Water should always be available to both the jill and kits.



Marshall Premium Ferret Diet

Crude Protein (min):38%
Crude Fat (min): 18%
Crude Fiber (max): 3.5%
Moisture (max): 10%

Chicken By-Products, Herring Meal, Corn, Cod Fish, Dried Beet Pulp, Brewers Dried Yeast, Cane molasses, Salt, etc.

Housing, Bedding and the Nest

Stainless steel rabbit or guinea pig cages are adequate for routine housing. Pregnant ferrets should be individually housed by about 2 weeks prior to when they are due to whelp, and they need to be provided a nest box. At Marshall BioResources ferrets are provided a nest box with shredded aspen shavings as seen below. This allows the jill to make a very good burrow-like nest to keep the kits warm.



As you can see in the image on the left, there is a nest box provided with sufficient bedding. Wet feed is provided to the jill on a solid tray platform, and is accessible to the kits as well by 3-4 weeks of age. The ferrets have ad-libitum access to water via the automated sipper, and unlimited access to dry feed as well. Water cups can also be used while the kits learn to use the sipper.

Polypropylene rodent cages, cat litter boxes or plastic dishpans are some possible options for nest boxes. Nests should be at least 6 inches deep to prevent newborn kits from wandering. Examples of possible nest box options are shown below.



Appropriate bedding material (shavings, shredded paper, etc.) should also be used to provide warmth and comfort for the jill and kits. There should be sufficient bedding in the nest box so that the kits are in no danger of contacting the plastic floor of the nest box. The kits will not be able to crawl to the jill to suckle if they push against the slippery plastic flooring. At Marshall BioResources, spot removal of soiled bedding is maintained during the entire kit-rearing period, however, a complete bedding change is made to aspen chip at 2 weeks post-whelp. An adequate amount of bedding is added at 3 weeks post-whelp to ensure that the young kits will be able to easily reach the wet food on the platform. The bedding is completely changed again at 4 weeks post-whelp and from 4-6 weeks spot cleaning and the addition of bedding is performed as needed.

It is extremely important that the jills have sufficient privacy to protect them from activity in the area, or they may fail to care for their kits. Newborn kits chill easily, so a good nesting arrangement, with supplemental heat if necessary, is important.

Temperature

The recommended temperature range for housing ferrets in research is 40-65°F (4°-18°C). Animals less than 6 weeks of age should be kept at temperatures around 65-70°F (18-21°C). The sweat glands of ferrets are poorly developed and they are therefore susceptible to heat prostration. Temperatures greater than 85°F (30°C) cannot be tolerated by ferrets. Standard temperature settings used for research rabbits should also be appropriate for ferrets.

Parturition and Nursing

Noise and disturbance should be kept to a minimum the week before whelping and until kits reach 5-7 days of age. Excessive or unfamiliar noise, handling, or disruption during this time may cause the jill to become stressed or anxious and can result in the cannibalizing of her kits. It is important to monitor jills during the birthing process and subsequent lactation, however, minimal handling is best. At Marshall BioResources, kits are handled when their cords are clipped and approximately once per day to be examined or receive routine treatment.

Jills usually complete whelping in less than 8 hours. If parturition is delayed past day 42, then it should be induced using prostaglandins (0.1 ml Lutalyse). If retained kits are palpated after most of the litter is born, 0.1 ml oxytocin may be administered IM. Dystocia can sometimes be a problem if the kits are large, or if the whelping process occurs too quickly and two kits become lodged together in the birth canal. Cesarean sections may be performed in an emergency, and usually jills will still lactate and nurse following the procedure.

There may be a few additional instances where intervention does become necessary to preserve the health of the kits or the jill. It is common for ferrets to have very quick parturition. This can also sometimes result in tangling of several umbilical cords and placentas. The tangle will appear as a ball of kits bound together by their cords, bedding may also be mixed in the tangle. Immediate intervention will be necessary to help free the kits from the tangles as they can become dehydrated without access to the jill to nurse, and the jill may injure the kits as she tries to free them from the tangle.

On the other hand, if jills have prolonged or complicated parturition, kits born early may become cold as they are not attended to by the jill. It may become necessary to keep the kits warm in these circumstances until the jill can care for them. Jills are also more likely to nurture kits following separation if they are warm.

Jills should ideally nurse 7-8 kits for optimal lactation to be sustained. Small litters can cause insufficient stimulation to maintain lactation. If a jill has a litter larger than 7-8 kits, ideally the additional kits should be fostered to another suitable jill, possibly a jill with a small litter. Kits will be more easily placed in foster situations with jills that have given birth to kits of similar age. For an optimal outcome, kits should be fostered to jills that have whelped within 3-5 days of their birth date, or minimally within the same week. Ferrets are rather gregarious and the females accept new kits quite readily. It is important, however, to ensure foster kits are warm and viable when introduced to the litter so they will be accepted and can compete for access to nursing. On occasion, a first or second parity jill may have up to 9 or 10 kits, which she can usually care for on her own. However, multiparous jills should not be left to nurse large litters alone. In some cases allowing two jills to nurse their litters together in the same nest may be advantageous, or a lactating jill without a litter can be added to the nest to help nurse an exceptionally large litter.

Make sure that some wet feed is accessible to the jill from the nest just following parturition, as she may not leave her nest to eat initially following delivery, and proper nutrition is essential for sufficient milk production.

The kits are immature at birth and remain dependent on the jill for the first 3 weeks of life. Kits weigh 8 to 10 grams at birth and about 100 grams at 3 weeks. Teeth erupt by 14 days. The eyes and ears open after they are 30 days old. Weaning may be accomplished at 6 weeks of age.

Assessment of Lactating Ferret Health

Jills should be examined daily to monitor their health and behavior. If a typically active jill appears to be quiet or depressed, this indicates a possible illness. It is important to monitor the appetite and water consumption of the jill as well. The mammary chain should be examined daily in a healthy, active jill; and more frequently in a jill showing signs of illness. If the mammary glands appear unevenly swollen or inflamed, or have an erythematous or even cyanotic hue, this indicates mastitis and these jills must be treated immediately with antibiotics such as Sulfatrim® (sulfamethoxazole/trimethoprim, 240 mg/5ml) at 0.5 ml/750 gm PO, roughly every 12 hours for a minimum of 5 days and up to 10 days if swelling and signs of infection are still observed. If severe mastitis is observed, the jill should be treated additionally with banamine (50mg/ml) at 0.15 ml/750 gm IM once daily for 1-3 days to treat pain and inflammation, and given 50-75 ml subcutaneous Lactated Ringers solution 2-3 times daily or as needed to treat dehydration.

Weaning Kits to Solid Food

When the kits are approximately 2-2.5 weeks of age, they can be introduced to feed by scattering about a handful of softened food pellets (~1 part feed to 1 part warm water) in the nest. At this age, the kits may begin to consume the food placed in the nest.

Introduce the wet feed slurry (~1 part feed with 3 parts warm water) to the kits at 3 weeks of age. This can be fed on a pan or platform directly adjacent to the nest so that the kits can easily access the food while still remaining in the nest. Provide approximately 1/2 cup of the wet feed for each litter. The kits will begin venturing out of the nest and will begin exploring the cage floor at about 4.5-5 weeks of age, at about the time when their eyes open. At this time the wet feed can be moved further from the nest by about 2 inches. As the kits continue venturing about the cage they should be able to easily access the wet food at further distances from the nest. The kits will also begin eating the dry diet provided for the jill by about 4.5-5 weeks of age as well. This gradual introduction of solid food will also help the kits to slowly decrease nursing from the jill so that she has a gradual decrease of milk production as well.

Water cups are also provided in or near the nest until the kits reach approximately 4 weeks of age. By 5 weeks of age the kits can usually successfully use the water sipper.

Return to Estrus and Estrus Suppression

Jills will return to estrus soon after the litter is weaned if the daily light cycle remains at 14-16 hours. This should be prevented, unless breeding is desired, because jills are induced ovulators and will remain in heat indefinitely. As mentioned, their high estrogen levels induce severe and frequently fatal bone marrow suppression. Reducing the photoperiod to only 8-10 hours of light daily at the time of weaning will prevent most, but not all, jills from developing a postpartum estrus.

If estrus occurs, estrus suppression may be accomplished by administering human chorionic gonadotropin (hCG, 100 IU) IM after the jill has been in estrus for at least 10 days, as is evidenced by vulvar swelling. The vulvar swelling should begin to subside within a few days following the injection. If vulvar swelling does not subside within 5-7 days following hCG injection, a second dose may be given. Administration of hCG is only a temporary solution, and this therapy does not always work effectively. Placing the jill in a short light cycle may increase the success rate. Jills may also be bred with vasectomized males to induce ovulation without resulting pregnancy as well. An ovariectomy can also be performed to avoid post-estrus anemia.

For additional information or questions concerning the care of pregnant, periparturient or lactating ferrets, as well as neonatal kits, please contact the veterinary staff at Marshall BioResources at 315-587-2295.

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