Rat Reproduction: Mating, Gestation, Birthing, and Growth

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Rats are very easy to breed. In fact, many people end up with unplanned baby rats! Rats can reach sexual maturity at 5 weeks of age, so the sexes should be separated prior to this age. Rats do not recognize incest, so brothers and sisters and even mothers and sons must be separated.

Rats do not have a breeding season, although very hot or cold temperatures will reduce breeding. Females of breeding age come into heat all year-round, every 4 to 5 days, unless they are pregnant, and even then, they may come in heat once or twice early in the pregnancy. Each female usually has a regular schedule that can be marked on the calendar, but it can vary. Each heat usually begins in the evening and lasts most of the night.

As a female approaches menopause at about 18 months of age, her cycle will become more irregular until it stops completely, and if she is bred during this time, the size of her litters will decrease as her fertility wanes. It is possible for a female who has stopped cycling to get pregnant, although the pregnancy may not develop normally.

It is possible for domestic rats (Rattus norvegicus) to mate with roof rats (Rattus rattus) although the babies will not survive. The embryos will be reabsorbed, aborted, or born dead.

A Responsible Decision

Before deciding to breed your rats, you should consider a few things. Do not breed rats who have, or have had, active mycoplasma infections. You should only breed rats who are free of respiratory symptoms and therefore hopefully resistant to mycoplasma. Second, rats have large litters - average is 10 to 12 - so if you do not plan to keep all the babies, you will have to decide how you will find homes for them. Keep in mind that most pet shops sell 50-90% of their rats for reptile food. In my opinion, the only reason to breed rats is to produce healthy, well socialized pets.

If you have decided to breed your rats, you must also consider their age. The best time to breed a female for the first time is at 4-5 months of age. It can be dangerous to breed a female older than 6-8 months of age for the first time, since her pelvic canal will be fused in a narrow position. This will put her at risk of being unable to deliver her babies normally. In such a case, a Cesarean section may be necessary to save her life. If a female of any age has a difficult birth, do not breed her again.

Age is not such an important consideration for males. Males can be fertile into old age. If you plan to breed a female a second time, it is a good idea to wait several weeks after her litter has been weaned to allow her to recover, both physically and mentally!

The Mating Process

You can breed rats by simply putting a pair together for 10 days, insuring they are together through two heat cycles. But since the female might fight the male, a better way is to put the pair together only when the female is in heat. This works especially well if you are breeding your rat to one who belongs to someone else because the pair only has to be together for one evening.

When a rat is in heat her vagina will gape open; otherwise it is tightly closed. Usually there will be behavioral signs too. Stroking her back will usually cause a rat in heat to perform the mating 'dance' which is quite interesting. She may first dart forward or spin around, then she will brace her legs stiffly, lift her head and tail, and vibrate her ears! This display tells the male she is ready for mating.

Most males will be interested immediately and will sniff and perhaps lick her. When mounting he will grasp her scruff with his teeth. During the courtship, mounting will occur numerous times, but most of this is foreplay. Usually the male must mount many times before completing the act, and mating will continue for some time. However, it is possible for a female to get pregnant from a single mounting, so do not let your girls and boys play together if you do not want them to mate. Even if the female is not in heat, a determined and persistent male can sometimes stimulate her into coming into heat, so keep your unneutered males and females separate! Females in heat will sometimes also escape their cage to visit a male.

Planning for the Birth

The gestation period is normally 22 days, but can vary from 21 to 23 (and rarely to 26). A postpartum pregnancy will last 28 days. Two weeks into the pregnancy the mother's abdomen will usually start expanding, but not always. As the birth approaches, you may be able to see the pups moving inside her, or feel them if you gently feel her abdomen. Her mammary glands will also start to enlarge two weeks into the pregnancy.

The mother's needs are simple: a nutritious diet, exercise, and extra nesting material a few days before the expected event. If you've been letting the male live with the female you should remove him before the birth. The father would very rarely hurt his babies, but all females come back into heat within 24 hours of the birth - called the postpartum estrus - so if you leave them together she would immediately become pregnant again.

If the pregnant female has been living with another female, or a neutered male, it is all right to leave them together during the birth and the raising of the babies, as long as the cage is large enough to allow the mother privacy. However, it is not a good idea to leave two pregnant females together because although they will not intentionally hurt each other's babies, they may

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steal them from each other. If this turns into a tug-of-war, the infant's tender skin can be severely damaged by the females' sharp teeth. Never put a new rat in with a pregnant or nursing female, because she will viciously attack it. The exception to this is babies about the same size as her own. A nursing mother will almost always adopt other babies, even babies of other species, allowing easy fostering.

Sometimes a pregnant or nursing rat has a change in personality due to hormone changes. She may become more aggressive, or less interested in playing. In rat society, a mother rat is usually dominant over all other rats, even if she is usually submissive. However, when her job of child rearing is over, the mother will usually regain her former status and personality. It is also common for a nursing mom to have soft stools.

The Birth Process

The birth process normally takes about an hour or two. In general, the mother rat will deliver a new pup every 5-10 minutes. In rats, the average litter size is 6-13 pups. The first sign is a bloody discharge from the vagina. Next, the contractions will cause her to stretch out while her sides suck in, in a most amazing way. Once the babies start arriving, the mother will sit up and help deliver them with her hands and teeth. Then she will clean off the birth sac and lick the newborn. The mother will usually eat each placenta and the umbilical cord. During this process a healthy baby will wiggle and squeak, which inhibits its mother from eating it too. However, if a baby is weak or dead, this inhibition may not occur.

Most female rats are wonderful mothers, but rarely there can be problems. If the mother is stressed, either because of pain from a long difficult birth, or from environmental disturbances such as unusual loud noises, etc., she may kill and eat some healthy babies. A poor diet may contribute to this problem. You can try removing the babies and giving them back to the mom once she settles down.

After the birth is completed and the mother settles down to nurse her litter, there is much less danger of her eating them. If you want to look at the babies, wait until she is off her nest and first remove her from the cage. Some mothers will rush to defend their babies if they squeak when handled. Do not worry about putting your scent on the babies as this will not cause the mother to reject them. However, if the mother seems very nervous, then you should look only and wait a day or two after the birth before handling the babies. It is a good idea to examine the babies every day to identify any problems or remove any that have died. Rarely, on the first day the umbilical cords will get entangled and you will have to separate them.

Difficult Births

Birth in rats usually proceeds without need for assistance, but occasionally, and especially in first-time moms older than 6-8 months, there will be problems. I have seen 3 rats who died during birth, and I have heard of several others. The danger of an obstructed birth is that the mother can go into shock. A Cesarean section may be possible if done soon enough.

Once the birth process begins, if no babies are delivered within 2 hours, there is definitely a problem. The rat's uterus is shaped like a Y and a baby can get stuck across the bottom of the Y. Gently massaging the mother's abdomen may help reposition the problem baby. If a baby is stuck in the birth canal, it may be possible to lubricate it with baby oil and pull it out with forceps. Then the rest of the babies can usually be delivered normally or with the aid of oxytocin. If the mother survives the birth but has retained one or more unborn fetuses, she may be able to expel or reabsorb them. In this case it is a good idea to treat her with antibiotics to prevent infection.

If the mother dies and leaves surviving babies, or if the mother refuses to nurse them, the best chance for the babies is to foster them to another nursing mother.

Growth and Weaning

At birth, the pups are born hairless, toothless, and have short limbs and tails. They will start to have hair when they are 7 days old, and their eyes generally open when they are 13-14 days old.

Most mom rats know just what to do and take great care of their rats. Occasionally, there will be a tiny runt who cannot compete with his siblings for the nipples, especially in a large litter. You will be able to see if each baby has nursed by the white milk in their stomach which is visible through their thin skin. The best solution is to temporarily separate some of the other babies into another container to give the runt a chance at the nipples. Leave about 4-5 babies with the runt to stimulate the mom to suckle them. If the runt is all by himself, the mom may not pay attention to him. As long as the other babies are kept warm, there is no harm in them being away from the mom for up to 4 hours. You can put their container on a heating pad on low or near a light bulb (be careful not to let them get too hot.) Rotating the groups of babies with the mom every 2-4 hours will give the runt the best chance.

Baby rats grow incredibly fast. I recommend you hold and look at them every day to witness this miracle. This handling will also help stimulate and socialize the babies. When they are 2 weeks of age you should play with the babies as much as possible. The more you handle them, the better socialized they will be. At this age they will also start to eat solid food. They will either walk to the dish, or their mom will carry food to the nest. You do not need to provide any special food for them.

Babies can be weaned at 4 weeks, but you can leave the girls with their mom as long as you want. Remove boys before 5 weeks or they may breed with their mother or sisters.

Warning: If your mother has a wheel in her cage, be sure the clearance between the wheel and the bottom of the cage is at least 1½ inches. If it is less than this, you need to remove the wheel while the babies are 2-3 weeks old. Otherwise, a baby can be trapped under the wheel and suffocate.

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