

How to Care for Newborn Rabbits (up to 2 months old)

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Introduction

This paper gives detailed information on how to care for newborn domestic rabbits (i.e., up to 2 months old). I work only with foster rabbits and do not breed rabbits myself. Unfortunately, all too often, a newborn litter of rabbits is brought into a shelter and they are not able to care for them. That's why I care for baby rabbits.

Note that I am not an expert. This is simply information I have gathered through the years. Links to products mentioned in this paper are listed at the end.

Make the Nest Box

You may be caring for a female rabbit & not know that she is pregnant. Since a rabbit can get pregnant immediately after giving birth, if you are caring for a mother & litter, when the litter is about 28 days old, she may give birth to another litter. It is very difficult to determine if a rabbit is pregnant.

If the female is within about 5 days of giving birth, you may be able to feel the baby rabbits inside. Sit down with a blanket on your lap & quietly hold the mom on the blanket. Pet her calmly so she will sit quietly. Put your hands on her sides

(or under her belly, if she will allow this). Hold your hands still for many minutes. Eventually you may feel kicking inside. It feels like tiny rapid-fire kicks that are quite subtle. Do NOT palpate the babies at this age.

If an adult female is pulling her fur or gathering hay into the litter box, although it might be a false pregnancy, assume she's pregnant & make a proper nest box as described in this section. Put her collection of fur/hay into the new nest box. Also supply her with more hay & shredded paper outside of the nest box so she can gather it & place it how she wants it. If she does not have babies a week after pulling fur, you can assume she is not pregnant.

If the babies come to you in an appropriate nest box, you can continue to use it. However, if the nest box is inappropriate, make a new one as described below. The mother might build her nest in a dirty litter box. This might happen if her caretaker did not know she was pregnant. This is an example of an inappropriate nest box. Another example is a nest box that's too small or the sides are too low.

A clean plastic litter box with high sides makes a good nest box (link at end). You can also use a wooden box, but it's harder to clean. Or you can use anything that has straight sides & is heavy enough so the mom can't tip it over. A cardboard box lid or cardboard box could also be used, but the mom might accidentally tip it over & they can get smelly. There are also metal nest boxes available commercially. They are ok to use, but might be too cold if not using a heating pad & too hot if you are using one. Having a lid on the nest box makes it harder to check on the babies. For a large rabbit (e.g., 9 lb.), 14 inches x 14 inches (35 cm x 35 cm) is not big enough. Mom's back feet will be outside of the box while feeding. The nest box should be just a bit larger than the mom. If it's too large, the babies might get separated & get cold & miss a feeding.

If the sides are high enough, this will help prevent the newborns from being dragged out of the box if they hang on during nursing when the mother leaves. It will also help prevent the babies from crawling out. If using a plastic litter box, try to get one with high sides. If the sides are too low, or if the sides are high but the front is low, use cardboard that is higher than the sides & use binder clips to attach the cardboard to the sides of the litter box. For instructions on how to do this, see: http://curiousbunny.com/nest_box_how_to.pdf.

Use soft fabric in the nest box. Soft fabric is: fleece; velour; flannel material (sheet, pillow case or shirt); soft cotton receiving blanket or T-shirt. Do NOT use terry cloth fabric with newborns. They can get their legs caught in a thread that

has pulled out & it can cut off circulation. For the same reason, do NOT use any fabric that has loose threads or frayed edges. Do NOT use any fabric that is hemmed with a very loose stitch (or cut it off before use). Also, do NOT use any fabric that has holes in it (the babies can get caught in the holes.) It's handy to use light colored fabric. That way, if there is diarrhea, it's easier to see.

If the fabric is stored in a cold area, before placing the newborns on the fabric, warm it first in the microwave or the dryer. In the bottom of the nest box, put in several layers of a soft fabric. Do not fold the fabric, as the babies could get stuck in the folds. Lay it flat & then scrunch the sides so it fits in the nest box. This keeps the center flat. If it is not flat, the babies tend to roll to the low spots. This is not good as it might separate the babies (then they could get cold) or it might cram them into a small area (then they can't spread out if they get too warm). Do not cover the newborns with fabric; it might block them from nursing. Use fabric only on the sides & bottom.

Instead of fabric, you could also use soft hay, like timothy. Alfalfa hay is too stiff. Add the hay & make a depression near the back of the nest box. The depression keeps the babies together. Don't fill the nest box to the top with the hay. If you do, then the babies can crawl out. Use just enough hay to keep the babies together.

Transfer the newborns & all nesting material that came with them into the prepared nest box, all in one fell swoop. The nesting material often includes the fur that the mother pulled to make the nest. Transfer as much of the fur as you can. After the babies are transferred, thoroughly go through all the nooks & crannies of the original nest to make sure no babies were left behind. They can hide in extremely small areas.

If the babies are not completely covered by the existing nesting material, there are a variety of nesting materials that can be added. Feel free to add nesting material every day (until they open their eyes) if the babies are not completely covered. This will help keep the newborns warm.

Fake fur is available commercially. One such product is called "litter saver nest filler", by KW cages ([link at end](#)). Use shredded newspaper. Copier type paper is also ok, but it's not as flexible as newspaper. Make the shredded paper with a shredder (not ripping by hand, as that usually does not make thin enough strips). Strips less than 12 inches (30 cm) long are best. Otherwise, they might get wrapped around the babies. Add cotton balls. The shredded paper keeps the

cotton balls above the babies. Use Carefresh Ultra, as it is soft. Groom the mother & put that fur into the nest box. If you have no mother, groom any healthy rabbit & use that fur.

If the mom is trying to add more material to the nest box (e.g., she's putting hay into it), put shredded paper into the cage (not the nest box) so she can put it into the nest box as she sees fit. Be sure she has hay available in case she wants to use that.

Once you have the babies in a clean nest box, it's best not to disturb the nest until they open their eyes. However, after about 5 – 7 days, it might get pretty stinky. If that happens, then you should clean the nest box. If you can smell urine/ammonia or if the nesting material or fabric is wet, it's time to clean the nest box. Do this quickly & re-use as much of the mother's fur & other nesting material as possible. Add additional nesting material if needed. See "Handling the Newborns" for information on keeping them warm while cleaning the nest box.

Prepare the Cage

Put fabric on the bottom of the cage, e.g., a cotton rug or towel. It's ok to use terry cloth fabric here, if there are no loose threads & no holes in it.

You should not keep your rabbits in a cage with a wire floor. If for some reason that is what you have, cover the entire floor with a solid material like wood. Otherwise, if the newborns get out of the nest box, their legs can get caught in the wire & could get injured or even lose a limb.

If you have wire mesh in the litter box, remove it. Babies' legs can get caught in it. You can replace it when you feel the babies have grown enough so that their legs will not get caught.

Keep the litter box clean. Put it in the opposite corner from the nest box. There may be some poop from the mother in the nest box. (Poop = fecal pellets.) That's good, as the babies may eat it, which helps to provide bacteria for their gut. In fact, if there is no poop in the nest box, take some from the litter box & add it to the nest box. However, don't let a lot of poop build up in the nest box. The babies also get good bacteria from eating the cecals from the mother.

In some cases, the mom will poop & pee in the nest box, all over the babies. What a mess. This is unsanitary & can cause the babies to get cold. This might

happen because the mom prefers to poop/pee on fabric rather than litter. In this case, put some soft fabric in the litter box (on top of or instead of litter). Then the mom might use the litter box rather than the nest box. In any case, remove any soaked fabric/fur from the nest box.

If the temperature in the room falls below 75 degrees F (24 degrees C), cover the cage (top, sides & back) with a sheet. If the temperature gets a bit higher during the day, you can leave the sheet on. At night, put a small comforter on the top. Keep the sheet on at least until the babies are 10 days old. You can also keep it on longer if you wish.

If the temperature in the room falls below 75 degrees F (24 degrees C), put a heating pad (link at end), on low, under the cage (i.e., not in the cage). Place the heating pad so it's half under the nest box. That way the newborns can go to a warmer or cooler spot in the nest box. Use a heating pad that always stays on (some turn off after a certain amount of time).

If you cannot protect the heating pad from the rabbits, use one that is hard plastic with a protected cord (link at end). That way, the rabbits cannot chew it nor harm themselves. If the rabbits can get to the unprotected portion of the cord, use a cord protector (link at end of Grooming paper).

If the temperature in the room is above 85 degrees F (30 degrees C), be sure the babies do not get too hot, as that can be fatal. Remove the sheet covering the cage & turn off the heating pad. Push the nesting material to the side. Be sure the babies have enough room so they can all spread out, without touching each other. Ventilate the room, but don't have a breeze directly on the babies.

If you get a mom who seems stressed, even if the babies are older than 10 days, & even if the temperature is over 75 degrees F (24 degrees C), you can use the sheet as described above to give her some privacy & help her to relax. If the mom is stressed, she might not feed her babies.

If the cage is in a shelter (or other high traffic area), cover all sides with a sheet or towel. This helps prevent the mom from being startled by the hustle & bustle of the shelter. Put a big sign on the cage saying, "Newborns, Do Not Clean," or use wording your shelter has approved. The sign is for the regular shelter staff. People who know how to care for the newborns can clean the cage as needed.

It's best when the sides of the cage are solid (as opposed to wire) from the bottom up to about 6 inches (15 cm). Some Marchioro and Midwest cages have this (links at end). If the babies get out of the nest box, & the sides of the cage are wire, the babies could fall through the wire. If you only have a cage with all wire sides, weave newspaper through the wire to block the sides, up to about 6 inches (15 cm).

If the mom is cage protective or a bit freaked out, put her into a carrier before doing things in her cage.

The cage should be in a quiet area, away from noisy adults, children & pets. There should also be no loud noise or music & no sudden movements. Keep human activity to a minimum around the cage. If the mom is startled, she might jump into the nest box with her babies & injure them.

Care of the Mother

A female rabbit may unexpectedly give birth to a litter. When in labor, the mother will usually stay in the nest box until all babies are born. She will clean the babies, eat the afterbirth (placenta & amniotic sac) (even though they are vegetarians) & eventually jump out. Don't confuse eating the afterbirth with cannibalism. As soon as the mom jumps out, you should check the nest box. If something is wrong, you want to know as soon as possible. Remove any dead babies & any afterbirth that is left.

Sometimes a mother gives birth at a place that cannot care for babies. In this case, move the mother & newborns to another place that can care for babies. It's best to wait at least 24 hours before the move, to let the mother & litter rest a bit. If she's getting proper care, it's even better to wait 5 days. But if she is being cared for by people with no knowledge of newborn rabbits, move them as soon as possible.

If there are any other rabbits in the cage, even if they are bonded, remove them as soon as possible, so the mom & babies can be alone. If there is more than 1 adult female in the cage & you might not be sure who the mom is. The real mom might have blood under the tail or on the inside of her back legs or have swollen nipples. She might also be the one staying in the nest box. She might also have pulled her fur so it will be very thin on her belly & sides. And, of course, she'll be the one nursing the babies. If in doubt, leave any females you think might be the mom in the cage.

If you have more than 1 female in a cage & you see nest building activity, separate all the females from all other adults, even if they are bonded. If one gives birth, she should have her own space, as other adults might accidentally hurt the newborns. You will also know who the real mom is.

If you have to separate rabbits who are bonded, it's best if they can still interact through the bars of a cage, so they can still get support from each other. This will also make it much easier to put them back together after they are spayed/neutered.

Give the mother unlimited alfalfa pellets & unlimited alfalfa hay. If you can't find alfalfa pellets or hay, ask the House Rabbit Society.

Give the mother fresh greens (e.g., romaine), 2-3 cups (or pack a 5 inch x 5 inch (12 cm x 12 cm) bowl) twice a day. If she seems interested in more greens, each day you can gradually give her more, as long as her poop does not get soft. You can give the greens throughout the day. Make sure they don't sit around so long that they wilt or get rotten. You can also give her a small bit of carrot. Do not give her cilantro, bok choy, herbs or anything from the cabbage family as they have a strong taste & may make the milk taste weird & then the newborns may not drink it (Note: some people feel there's no problem in feeding her the foods listed above).

Some moms are very thin. If that is the case, you can try to get her to gain some weight by giving her some oat groats. Give her 1 teaspoon (6 grams/5 ml) of oat groats twice a day. She will love them. Make sure the babies do not eat them.

Give her unlimited water. A water bottle is best. Make sure the spout of the water bottle is about 6 inches (15 cm) from the floor of the cage so the babies can reach it. They usually start drinking from the bottle when they are about 2.5 weeks old. If you use a bowl, the babies can get in the bowl & drown or get wet & die from hypothermia or get water in their lungs & die of pneumonia. If you must use a bowl, check the cage frequently, as the babies can get out of the nest box at any age. But definitely remove the bowl when the babies open their eyes (at about 10 days), as they will then be running all over the place. When the babies are 2 months old, then you can use a water bowl.

After the mom gives birth, every day, check to make sure she is eating, drinking & eliminating normally. Also observe her behavior. If her behavior is abnormal, that might mean she has a medical condition. It could be an infection, babies still

inside, milk fever, mastitis or something else. Also do a quick physical exam. If there are any issues, you want to find out as quickly as possible & possibly take her to a vet. Wash your hands thoroughly before handling her as you don't want to get bacteria on her nipples.

Check the poop of the mother for pin worms. They look like tiny string or hairs that flop around.

The mother will usually only spend time with her babies when she is nursing, which is usually only 1 or 2 times a day, lasts for only about 5 minutes & is usually at night. The rest of the time she will be away from her babies. This is natural, so don't think that she is ignoring her litter.

The mother should get exercise every day. At least 1 hour. Put her in an exercise pen or in a rabbit safe room. Since the mother spends so little time with her babies, no need to worry about her being away during exercise time.

You can even give her exercise time away from her babies for up to 3 hours. If she's exercising when she would normally nurse her babies, when she is returned to her babies, she will generally nurse them as needed. If you keep her out for more than 3 hours, she might skip a feeding, which you don't want to happen.

In her cage, give her toys. Pet her frequently throughout the day, so she gets some social interaction.

Cut her nails so she doesn't accidentally injure the babies. Do this only after she has settled in & if you can keep her calm. You don't want to stress her too much.

At any age, it's possible for any of the babies to have severe problems & pass away. If this happens, place the baby so the mom can see it. This will let her know that the baby has died. She will often lick it for awhile, & then stop. At that time, you can remove the baby.

Handling the Newborns

Before touching the babies, wash your hands properly. Use warm water (if needed, patiently let the water run for awhile to get warm). Use unscented soap. Wash for at least 20 seconds. Dry thoroughly with a clean (freshly laundered) towel. Patiently get all surfaces dry, including between your fingers. Do not touch your body, clothes or hair. If you have to touch something (like a

doorknob) to get from the washing area to the babies, use a paper towel so your hands stay clean.

The natural bacteria on your hands could harm the babies (whose immune systems are not yet developed). This also warms your hands. Do not use any scented lotion on your hands & do not use strong perfume. Do not touch the babies to your face or kiss them. Doing so could transfer harmful bacteria to them. The time period for being vigilant about keeping everything clean is until they are 10 days old. After that, kiss away.

When reaching into the cage, pet the mother first, with both hands. This will comfort her. It will also get her scent on your hands. This will make it better when you handle the babies. After handling the babies, pet the mother again, to reassure her. If the mother seems stressed when you reach into her cage, put her into a carrier before you do anything in her cage.

When you handle newborns, do your task quickly so you can return them to their nest as soon as possible. They chill quickly. It is important to keep the babies warm. If they cool off a bit, they have to expend energy to keep warm. It is better for them to expend this energy growing. Thus if they feel warm, you might think things are fine & be slack about keeping them warm. But if you haven't followed these steps, they may be expending too much energy in staying warm. Also, if the babies are cold, they cannot digest food. The time period for being vigilant about keeping them warm is until they are 10 days old.

I cannot stress this enough. Domestic rabbits are unique in the animal kingdom in how they care for their newborns. There are many mammals that have newborns with no fur (e.g., mice). All of these mammals (except four species), spend a large amount of time with their newborns (mice spend 90% of the time with their newborns). The four exceptions (including domestic rabbits) spend less than 1% of the time with their newborns. For these, the newborns keep warm by snuggling with each other in a well insulated nest. If removed from the nest, the newborns of three of the four exceptions are able to thermoregulate for a short amount of time. However, for the domestic rabbit, if removed from the nest, the newborn cannot thermoregulate at all. It IMMEDIATELY starts to cool down. Therefore it is vitally important to keep it warm at all times.

If you are curious, the four exceptions are: tree shrew (*Tupaia belangeri*), pika (*Ochotona princeps*), cottontail rabbit (*Sylvilagus*) and the domestic/European rabbit (*Oryctolagus cuniculus*).

If you need to remove them from the nest box for more than a minute, wrap them in soft fabric. If you need to set the babies down outside of the nest box (e.g., to take a photo), only put them on warm, soft fabric. If you need to take the babies out for awhile (e.g., if you have to clean the nest box), put them into a basket that is lined with soft fabric. Put soft fabric on top of them. Put the basket on top of a heating pad.

From 0 – 10 days, only 1 person should handle the newborns. If need be, an experienced person can also handle them.

They can “pop” like popcorn at any time. This means that even when they are sitting very still in your hand, they can, without notice, jump up several inches. If you are not prepared, they can easily jump out of your hand. So, at ALL times, when you have a baby rabbit in your hand, be sure your fingers (or the other hand) are over the baby.

Also, they might pee when you handle them, so don't hold them over anything you don't want to get soiled. Even little ones can produce quite a stream. I've been squirted in the face quite a few times.

Care of the Newborns

Check the nest box to see if there is any poop from the newborns (the mother will sometimes lick them clean after feeding so there may be none). If there is diarrhea, or if the poop is green (or any color other than black) or stinks, that's a problem. Be sure all the babies are together at the back. If they are separated, they can get cold. If they are near the front, the mom might step on them when she jumps in.

Until they leave the nest box, the babies should be checked twice a day. After that, check them once a day. Before their eyes are open, do the check quickly so they do not get cold. Make sure they are not entangled in the afterbirth or the nest material. They should move a lot when handled, but sleep otherwise. They should be quiet most of the day. If they cry most of the day, they are not being fed enough.

Check their eyes for any crustiness.

Check their nose & under their chin (looking for injuries, dirt & wetness). They are obligate nose breathers, so if the nose has any debris in it, it is very important

to clean it out. Gently wipe the nose with a DRY Q-tip. If that doesn't get it out, put a bit of water on the end of the Q-tip & squeeze it to get the excess water out & use it to clean the nose.

Check their bellies to make sure they are round. The skin should not be wrinkly over the belly. You might be able to see some white which is milk in the stomach, or at least see some translucent spots. The belly should be much wider than the head. Areas with no fur should be pink (not bluish).

Examine the bottoms of their feet (to make sure there is no poop stuck to them). Touch their feet so they get used to that feeling. This will make it easier to do nail trims in the future. Check their anal area to make sure poop is not stuck there (it can make a mess) & there is no diarrhea. If there is just a bit of poop, leave it alone & it will fall off later. If there is so much that it might block the anus, gently clean it off with a warm, damp cloth. For older babies, if poop (usually cecals) tends to cling to the fur, very carefully trim the fur around the anal area.

If you don't want to turn them over to do the check as described above, you can still check them by putting your hand under their tail to feel for matted/poopy fur around their anus. This check takes only 2 seconds & can quickly tell you if they have poopy butt.

Newborns should always feel warm. If they are cold, this is very bad. Warm them up as soon as possible. If MANY babies are cold, fill a bottle with warm (not hot) water, wrap it in a thin towel, & place it in the nest box. Or fill an old sock with uncooked rice, secure the top & microwave it & place it in the nest box. Or use a gel or ceramic type heating pad (no electrical cord) (link at end) in the nest box. Or use an electrical heating pad under the nest box.

If ONE baby is cold but STILL moving, immediately wash your hands in warm water to warm your hands, thoroughly dry them, then take the baby out & warm it in your hands, next to your body, or in your pocket or bra, while you prepare the following. Warm up some soft fabric, either in a dryer. Wrap the baby in the warm fabric & place him on a heating pad. Then cover everything with another towel, for insulation. If you don't have a heating pad, you can use a bottle of warm water or a sock filled with rice (see above). You might want to do all of this on your lap. Time is of the essence. Wait 2 minutes & then check on him.

If ONE baby is cold & NOT moving, there still may be hope. In this case only (do NOT do if baby is moving), immerse it in warm water from the shoulders on down & massage the body. You may be able to revive it. If that happens, be sure to then thoroughly dry the baby, all the while keeping it warm. I have not done this myself, but have read about it and might be worth trying.

If a newborn is cold, do not let it nurse. It will take too much of his energy. He should be using his energy to get warm. Do not feed him by hand, as the food will just sit in his stomach & not be digested. Feed him only after he has warmed up.

Even when they are older, up to 2 months old, take 5 seconds a day to turn them onto their backs to check their undersides. If a rabbit is eating (i.e., actively chewing), be sure it has finished before you turn it on its back. You don't want it to choke on its food.

Weigh them at the same time every day until they leave the nest box. Additionally, you can weigh them until they are 2 months old. Use a gram scale for accuracy (e.g., kitchen or postal scale) (link at end).

Here is a handy spreadsheet to record their weight:
<http://curiousbunny.com/spreadsheets.htm> (then click on "Weight Spreadsheet here").

The babies will usually open their eyes at 10 days, but can be between 9 and 12 days. At this time, they will also be able to hear. Before this time, they can only feel & smell. Starting at day 9, pay particular attention to the eyes to see if they are open.

If the eyes are not open by day 13, take the following steps to help open the eyes. Put a couple of drops of sterile saline (e.g., contact lens solution) on the closed eye. With clean hands, touch the solution lightly to make sure the solution makes contact through the fur to the eye lid. Hold a warm (not hot), damp cloth on the eye. On top of that, hold a warm (not hot) eye stye warming compress (the type used for human eye styes), (link at end of Grooming paper). Do this for up to a minute. If you don't have an eye compress, re-warm the cloth when it gets cold. Then very gently, wipe it with a warm, damp cloth. If the eyes are not open by day 14, call your vet. If they don't open soon after this, the baby might have permanent eye damage.

Once their eyes open, when taking pictures, do not use a flash, as it can hurt their eyes.

If a baby gets outside of the nest box, the mom cannot but it back inside. When they are about 11 – 12 days old or YOUNGER, if they get out of the nest box, they can get cold & die. The cage should be checked at least 3 times a day to make sure all the babies are in the nest box. If any are out, they should be put back in. If they feel cold, they should first be warmed (see above) before putting them back in. When I have a litter of newborns, I'll often wake up in the middle of the night to check them to make sure none are out of the nest box. I'll do this until they are about 4 days old.

When they are about 11 – 12 days old or OLDER, if a baby gets out, then it's time for all babies to be out. The one who is out can't get back in & then might miss a feeding. So, at this age, when one baby is out, to make sure all babies are together for a feeding, remove the nest box & add a hidey box. If the fabric from the nest box is not too stinky, put it under/in the hidey box for a few days. This will give the babies a familiar scent, which will ease their transition out of the nest box. At 15 days old, remove the nest box even if no babies are out. If they stay in too long, they might get an eye infection.

Once the babies are running around, if they are in a small area, the mom will have a hard time getting away from them. They will try to nurse from her constantly. To give the mom some relief, make a platform so she can jump up onto it. Make it high enough so the babies cannot follow. One way to do this is to put a hidey box in the cage with a flat top that is large enough for the mom. She can then jump up on top of the box to get away from the babies when she needs to.

The mom will sometimes hang out in the litter box to get away from the babies. If that is the case, it's nice if she can reach her food pellets/hay/water from the litter box.

When babies leave the nest box, supply low food bowls with alfalfa pellets. Babies will often sit in the food bowl & poop & pee in it. Pee will dissolve the pellets & then clump them together, but sometimes it's hard to see. Run your finger through each bowl each day to check for pee in the pellets. If there is pee, throw out all the food. It's handy to use several small food bowls. That way, only food in one bowl has to be tossed. If there is poop in the bowl, you can pick it out; no need to toss the whole bowl. Be sure to have enough bowls so they have

food all the time. Space them out so they can't sit in one while eating from the other.

The mother will have alfalfa hay at all times, but when babies leave the nest box, be sure they can access it.

You can start feeding the babies lettuce at 3 - 4 weeks of age if they have no diarrhea & no medical issues. Give a small amount of romaine for a few days. If all is ok (i.e., they do not have soft stools), you can then add green leaf or red leaf lettuce, or just stick with romaine. These 3 types of lettuces are the least likely to cause issues for the babies. If babies get diarrhea, they can go downhill quickly, so at this young age, it's best to not introduce other types of greens.

When the babies are about 2 weeks old, they can get out for exercise. If you use an exercise pen (Xpen), be sure to supervise them for awhile to make sure they cannot get out between the bars. I've noted that if the bars are 1-3/8 inches (3 cm) apart, the babies can get out when they are about 1.75 pounds (844 grams). To prevent this, attach baby bumper pads (that are used in a human baby's crib) along the bottom edge of the pen. Attach them to either the inside or the outside, whichever works for you. Or you can cover the lower slots in the Xpen by weaving cloth or newspaper thru it. You can also cover it with wire mesh or cardboard. An easier way is to get an exercise pen with closely spaced bars (link at end).

If there is only one baby (called a singleton), it won't have any siblings to snuggle with. In this case, supply a small fake sheepskin rug & a stuffed animal that it can cuddle up to. Do this if it's an orphan or even if it has a mother. Even after it opens its eyes (when you would normally remove the heating pad), you might want to keep the heating pad on, especially if the room is cold.

It's important to socialize the babies so they are comfortable with humans & more easily adopted. Before they leave the nest box, check them twice a day but do not handle them more than that. As they get older, you can handle them more & more. In a home environment, the more interaction the better. In a shelter environment, you don't want a ton of people handling them, as you don't know what bacteria they have on their hands nor how careful they will be with the babies.

The younger they are, the more they sleep. Don't socialize so much that they don't have enough nap time. While moms usually nurse at night, they can nurse

at any time of the day. If you are socializing the babies, do it in a place when you can see the mom. If you have only some babies out & you see mom nursing the other babies, quickly & quietly return the babies to mom so they don't miss a feeding.

Babies being babies, they have to pee frequently & you don't want pee on your lap or couch. Thus put a waterproof blankie (link at end) on your couch or lap. Or use a waterproof mattress cover (cut & sewn to fit your couch).

To socialize the babies, pick them up & hold them in your hands so they get used to that. Sit on a couch & let them run around. Sit on the floor with them with a waterproof blankie on your lap. When they are old enough, put lettuce on the blankie & they will love to jump in your lap.

After cleaning up for the day, lie down on your back on the floor & put a waterproof blankie on your body. The babies will come over to explore & jump on your body ... maybe even play king of the mountain on your stomach.

Problems with Feeding

If you have concerns about the babies not getting enough milk, turn the mother over & examine her nipples. "Milk" the nipple to see if there is any milk or clear liquid. To do this, place your thumb & first finger at the base of the nipple. Roll your fingers towards the tip.

If the mother has no milk, sometimes the nursing action from the babies starts the milk production.

Rabbits are capable of having litters 1 month apart. When this happens, the second litter might be less healthy, as the mom's resources have been depleted. It also might be more difficult for her to produce enough milk. Also, the smaller the baby, the less energy reserve it has. Thus, if a baby from a mother who is 2 pounds is struggling to eat, it will go downhill more quickly than a baby from a mother who is 5 pounds.

If you think the babies are not eating enough, here are some ways that might help.

Put hay in the nest box, along the side. This might tempt the mother to enter the nest box.

Put the mother in the nest box. To keep her there, pet her or hand feed her with her favorite food. If she wants to jump out, do not hold her down.

If the mother did not pull much fur, the nipples might be covered in fur, making it hard for the babies to nurse. If you think this is a problem, you can use blunt nosed scissors or an electric shaver to carefully cut the fur away from the nipples. Only attempt this if you have a very steady hand. Be extra careful not to injure the nipple. A rabbit's skin is very thin.

It is tricky to know when to intervene with feeding. It is best to have the mother nurse the babies. While a baby can live 3-4 days without food, if it goes even one day without food, it might be too weak to nurse & will slowly die. Babies should gain weight every day. If they have lost weight one day, you might consider supplemental feeding. If the belly is wrinkled, you might consider supplemental feeding.

If you think the baby is getting some milk from mom but not enough & decide to do a supplemental feeding, consider what time of day to do it. Since mothers usually nurse once a day, do the supplemental feeding half a day (12 hours) after that, so the stomach is somewhat empty but the baby will still be hungry for the next feeding. Since mothers usually nurse at night (let's say 2 am), then the supplemental feeding would be at about 2 pm.

In some cases, the baby might not have any energy to nurse. In this case, using a syringe, put 1/2 drop of pure fruit juice (e.g., orange juice, no sugar), at room temperature, on their lips or gums so they can lick it off. Or you can soak a Q-tip in the fruit juice & press it onto the lips/gums. Wait 2 minutes. This will increase their blood sugar to give them enough energy to nurse or to accept supplemental feeding.

If the babies are still not getting enough to eat, there are several more options. One option is to give them a private feeding with the mother (see Private Feeding With Mom). Another option is to hand feed them (see How to Hand Feed with a Syringe). Yet another option is to find another nursing mother that can help (see Caring For Orphaned Babies). A final option is to have a vet or experienced caretaker tube feed them. The tube is placed down the throat into the stomach so the food can't be aspirated. This is a very difficult maneuver.

Private Feeding With Mom

There may be one or more babies who are weaker than the others & are not getting enough milk during the mad dash at nursing time. In this case, it may help to give them private feedings with mom (as described below). But there's more to it than just placing the baby next to mom. The milk is not ready to come out at all times. There's a process to let the milk come out (this is called let-down of the milk, let down of the milk or let-down reflex).

I've noticed that when there are no issues with nursing, when it's time to nurse, mom will run in circles around the room. The babies know it's feeding time & they give chase. Mom will stop & the babies will try to nurse. But mom will then thump her hind legs & run some more. This is repeated many times. She will then stop & allow them to nurse. While I have not read this any place, I'm convinced this helps to let-down the milk. In addition, the stimulation of the babies trying to nurse (& pounding with their tiny paws) helps to let-down the milk. Thus, before you give a private feeding, you should get the mom to run around (as described below). Also, even if only 1 baby is weak, it's best to have 3 babies feeding at once, to help stimulate the flow of milk.

I have tried private feedings without the initial running around of the mom & with only 1 baby many times, but the baby's stomach never gets full. I'm told it still might be useful, as even a small amount of milk can help. But it seemed to be a lot of effort on everyone's part with not much to show for it. After I used the technique of getting the mom to run around & always using 3 babies, I finally saw the bellies get full. What a joy to see.

Here are some suggestions to get the mom to run around to help let-down the milk. Most of these suggestions are ways to slightly irritate her so she'll run away. You may think that this is stressful for the mom, but I have found it's just a slight irritation & it's needed to let-down the milk, which is much more important. Do this so she runs around for several minutes.

Put the mom in a room (rather than a cage) so she has room to run around. If she doesn't like to be picked up, pretend to attempt to pick her up so she'll run away. If she doesn't like bare floor, put her on bare floor so she'll run to nearby carpeting. If she doesn't like to be combed, comb her & let her run away. Stamp your feet & clap your hands. Put her in an unfamiliar area so she can run back to her home base. Scratch her back just above her tail. Gently wiggle her tail. Put your hand under her belly, feet or chin (many rabbits do not like this). Vigorously rub her fur in all directions.

Immediately after getting the mom to run around for a few minutes, start the private feeding. Thus, you will transition from "slight irritation" to "very calm".

Another way to let the milk down is to let the others feed first during a private feeding (but keep 2 out). This will help to let the milk down. Then you can give a private feeding with the thin baby & the 2 you kept out.

When giving a private feeding with the mother (several options described below), keep the mother calm by continuously petting her forehead, from just above the nose to the base of the ears. It may also help to cover her eyes with a cloth. If the baby's eyes are closed, wrap him in soft fabric when carrying him to mom.

If the baby is extremely weak, give fruit juice as described above under "Problems with Feeding".

Sit on a chair. Put a heating pad on low in your lap, spread your legs slightly apart & push the heating pad down so it lines the gap. Put some warm soft fabric over the heating pad. Hold the mother on your legs so her belly is over the gap. Then put the baby under the mother, in the gap between your legs. It may be able to nurse in this position. Note that even though it looks & sounds like it is nursing, this may not be the case. It might be going through the motions, but it might not actually have the strength to get milk into its stomach.

An alternative to this position is to put the mother on a couch. You then have more flexibility to move around & can watch what's happening better. On the couch put down a heating pad on low, a soft fabric & then put the mother on this. Then put the newborn under the mother for it to nurse. If she doesn't hold herself up & the newborn is having trouble getting underneath, fold towels many times to make them thick. Put one under the mother's front paws & one under her hind paws. This will raise her up a bit. Pet the mother to keep her in place.

Another option is to hold the mother upside down (i.e., on her back). Then put the newborn on her belly so it can find a nipple. To save the baby's energy, when it looks for a nipple, place it right next to a nipple. Push the fur away from the nipple to make it easier for the baby. You can also "milk" the nipple to get some milk on the tip of the nipple (see Problems with Feeding). That way the baby just has to lick. I prefer this way as I can see exactly what is happening & I can help the baby find a nipple.

Be very careful. The mother might be still for awhile, but then suddenly kick her hind legs. This might send the newborn flying off. She could also accidentally scratch it if she kicks. So be sure to watch her hind legs at all times. You might want to cover her hind legs with a cloth or lean over & put your chest on them to help prevent her from kicking.

After 5 minutes, check the belly of the newborn. If the belly now looks full, it is getting milk & you can let it nurse until it stops on its own. If after 5 minutes the belly is no bigger than before, it is not getting any milk. Do not let it continue to try to nurse. This will just wear it out. If this is the case, you will have to hand feed it (see below). If the hand feeding works, this will give it nutrition, and it takes less of the baby's energy than nursing. However, mother's milk is always better than formula. Sometimes hand feeding it just one time will give it enough energy so it can then nurse. Other times, you will have to hand feed it more times.

After feeding, if their eyes are still closed, stimulate the anal area for 1 – 2 minutes by rubbing with a warm moist towel (or moist cotton ball or wet finger). A towel that is a light color is handy, as it makes it easier to see the yellow pee. This helps them pee and poop. It is ok if they do not pee/poop each time. Babies often squirm during stimulation but when they are actually peeing, they are often still, then squirm when it's over. That's tip off for you to know the baby has peed. Some people do this stimulation before feeding. If this is not done, they might get an over stretched bladder, which would give them medical problems when they get older. They can also develop intestinal tract problems.

If the baby wasn't able to nurse, wait an hour. Then give it a bit of fruit juice again & try nursing again. If the baby was able to nurse, at its next feeding, no need to use the fruit juice again.

If the private nursing with the mother did not make the newborn's belly full, it's tempting to "wait another day" before you try hand feeding. This could be a fatal mistake. A newborn can be very active which gives the impression that it has enough energy. This is deceptive. Newborns can be very active but they can still lack the energy to nurse. If the newborn goes a day without food, it can get weak very quickly. Nursing takes a lot of energy. If it didn't have enough strength to nurse one day, it will have even less strength the next day & will probably not make it. It is best to hand feed to give it strength so it can nurse next time.

If you are putting the mother & the newborn together like this for feeding, it's difficult to know how many times a day this should be done. It takes a lot of effort for a newborn to nurse & you don't want to wear him out with nothing to show for it. If you do this feeding & the belly is then full, that might be enough for the day. Or you could feed twice a day. If the belly is not full, you could try up to four times a day, but that takes a lot of effort on the baby's part. Don't do it more than four times a day.

Weigh the babies every day. You can also weigh the babies before & after feeding to see how much the baby drank.

Note that even when feeding well, newborns will spend only a few seconds at one nipple & then move to another.

How to Hand Feed with a Syringe

If a baby is not nursing or if the baby is not getting enough milk, you might have to syringe or bottle feed the baby. While a bottle is used by some, there is less control & you can't measure how much was consumed. These instructions are for syringe feeding.

When hand feeding, it is easy for the babies to aspirate the formula into their lungs, which could cause them to die, so be very careful. Keep a suction bulb nearby (link at end). If the baby gets formula in its nose, use the bulb on the nose immediately to extract the liquid. If you don't have a bulb, use your mouth.

For very young babies (1 - 5 days old), use a small syringe (1 cc) or a catheter tip syringe. A catheter tip syringe has a curved tip & is very thin at the end, getting wider towards the body. If it's too thin, you can cut the tip off a bit where it's larger. For a bit older babies (5 - 10 days old), a small syringe (1 cc) is fine. For older babies, you can use a larger syringe (3 cc or larger). For all syringes, you can optionally use a Miracle Nipple (link at end) on the end. Wash the syringe in hot soapy water & rinse well. Or use a plastic sterilizing steam bag (available at most pharmacies) to sterilize the syringe.

Read the formula label to check the expiration date & how to store it. Write the date you open it on the label. Before using, smell it. If it smells rancid, do not use it.

If you store the powder in clear bags, be sure to label the bag with the product name, expiration date & open date. Then remove all air & store it in a dark place.

Light tends to degrade the powder. If you have not used the powder in more than 2 months, stir it before using, as the ingredients can settle at different rates. If you freeze the powder, be sure to check it regularly for ice crystals. If they tend to form in your environment, then don't freeze the powder. The ice crystals can disrupt the emulsion of fat in the milk and cause problems when mixing the powder with water.

It's handy to freeze the reconstituted formula in ice cube trays (cover the trays, can use plastic wrap). Know how much is in each cube. Then you can thaw just what you need. Can also freeze in closed container or bag. After frozen, store in closed container or bag (remove all air).

When deciding on a commercial formula to buy, it's best to get one that most closely matches rabbit's milk, which is:

- 32% protein
- 49% fat
- 6.0% lactose (carbohydrate)
- 31.2% solids

Note that the fat content is very high. The specific types of fats & proteins are also important, as some are less digestible to rabbits than others. I do not have the background to analyze this. Lactose & solids are often not listed for the commercial products so it's difficult to compare using those values. Some manufacturers add other ingredients they claim makes it better for the rabbits. I do not have the background to judge these other ingredients. The homemade rabbit formulas I've seen don't come close to having enough fat content.

While formula composition is important, other items to consider are: availability, cost (consider powder to water ratio), how long it lasts and ease of mixing.

With so many unknowns, how does a person decide on which formula to use? Personally, I use a formula that's made for rabbits & that I can buy in the small quantities that I need. Thus for me, it's Wombaroo or Fox Valley Day One 32/40.

Here are some commercial formulas.

Wombaroo Rabbit Milk Replacer, (link at end)
made for rabbits

37% protein and 42% fat

Best choice for matching fat content

open container; refrigerator 1 month beyond expiration date, no not freeze

reconstituted formula; refrigerator 1 day, freezer 2 weeks
mixing; 1:1 (powder:water)
from package: 3 teaspoons (= 1 Tablespoon = 15 ml) powder to 12.5 ml/cc
water, which is about 1:1

Fox Valley Day One 32/40, (link at end)
made for eastern cottontails (rabbits), squirrels, opossums
32% protein and 40% fat
Second choice (tied) for matching fat content (although pretty close to
Wombaroo)
open container; refrigerator or freezer 1 month beyond expiration date
reconstituted formula; refrigerator 1.5 days, freezer unknown
mixing; 1:2 (powder:water)

PetAg Esbilac Powder Milk Replacer for Puppies, (link at end)
made for puppies
33% protein and 40% fat
Second choice (tied) for matching fat content (although pretty close to
Wombaroo)
While many rabbit rehabbers use PetAg KMR, PetAg recommends using Esbilac,
since the percent of fat is better.
open container; refrigerator 3 months, freezer 6 months (after opening)
reconstituted formula; refrigerator 24 hours, freezer 6 weeks
mixing; 1:2 (powder:water)

Pet Ag KMR, powdered (Kitten Milk Replacer), (link at end)
made for kittens
42% protein and 25% fat
last choice for matching fat content
open container; refrigerator 3 months, freezer 6 months (after opening)
reconstituted formula; refrigerator 24 hours, freezer 6 weeks
mixing 1:1 or 1:2 (powder:water) (see note below)

Pet Ag Zoologic Milk Matrix, powdered, (link at end)
specifies how to mix ingredients for domestic rabbits
use 82% Milk Matrix 30/52 and 18% Milk Matrix 42/25
32% protein and 47% fat
best choice for matching fat content but is listed last because it's difficult to find
a store that sells it and you have to buy a large quantity
open container; unknown

reconstituted formula; unknown
mixing 1:1 (powder:water)

When mixing the powdered formula, keep the measuring spoon in the container. That way you don't have to wash it each time. Use another measuring spoon for water, which you don't have to wash. If you have mixed the formula by shaking it, immediately rinse the lid that is used for the reconstituted formula. Otherwise the formula clogs up the groove in the lid very quickly. This will make final cleanup easier.

Use the directions on the container for amount of powder & water to use. Use tap water, distilled or boiled water (bring to rolling boil & then let cool). Mix the ingredients & shake well or stir with a fork or whisk (do not use a blender). Some people like to add just a small amount of water to form a paste. Then add the rest of the water. In some cases, this makes it easier to mix.

If you use a blender, fat will come out of solution & form small balls (like making butter). When they stick to the sides of the container, the rabbit will not be getting the fat it requires. If the fat balls are small enough to be suspended & they get into the rabbit, they still might be too large for the rabbit to digest. They will just sit in the stomach & cause major digestive issues.

Note that if you mix powder to liquid 1:2, the final volume will be the volume of the original liquid. For example, using 1 T (15 ml) powder & 2 T (30 ml) water will give 2 T (30 ml) of formula which weighs about 1.2 oz (34 grams).

For kittens, PetAg recommends 1 part powdered KMR and 2 parts warm water to get liquid. However, for rabbits, PetAg recommends a formula of 1:1 (1 part powder to 1 part liquid), since that more closely matches the % solids in rabbit's milk. This will make it hard to get through the syringe, but get as close to this as possible. This would also require less feedings per day (since it's more concentrated). Since the % fat is so low, to 4 parts of this made up formula, add 1 part heavy whipping cream. This helps but only brings it up to 27% fat. For example, mix 2 T (30 ml) powder and 1/4 c water (4 T/60 ml) to get 1/4 c (4 T/60 ml) of mixture. Then add in 1 T (15 ml) heavy whipping cream.

Pour out an amount of formula you think you'll use for that feeding into a small container. Put the rest of the formula into a sealed container & refrigerate it. Mark the date on it so you know when it expires (read the formula container for specifics). Next time you mix formula, use a different container (don't mix old &

new formula). Use the old formula (then wash the container to be ready for next time), then the new formula.

For the portion you will be using for the current feeding, heat it by putting the container in hot water until just barely warm (test on the inside of your wrist). Don't make it too hot. Do not reheat the formula. Using the microwave to heat the formula is not recommended. It often heats unevenly & also breaks down the proteins.

It's good to keep one hand on the baby when re-filling the syringe. Thus to hold the small container that contains the formula, put it into a slightly larger container (e.g., a berry basket) lined with a wash cloth. This helps to prevent the container from moving or spilling & you can also arrange the cloth so the container is tilted to make it easier to get the last of the formula.

The solids in the formula settle quickly. Stir the formula with the syringe each time before filling. Fill the syringe & knock the bubbles out. Wipe the syringe off before feeding the bunny.

If the eyes are closed, wrap the baby in soft fabric when carrying it to the feeding area, place it on a fabric covered heating pad set to low & keep the baby covered when feeding. If the eyes are open, place the baby on soft fabric. It's easiest to have the baby rabbit at eye height so you might want to put the heating pad/fabric on a box. Be aware that babies can jump at any time so be sure to keep a hand on the babies at all times. Get comfortable in your chair, as this might take awhile. The rabbit should be in its normal sitting posture (4 feet on the ground), not on its back (i.e., not like feeding a human baby; they can aspirate in that position too easily). If need be, lift the front portion of the rabbit's body so you can access the mouth. Babies like to alternately push with their front paws when nursing. Roll up some soft fabric & place it in front of the paws so they can push against that. If they are pushing into thin air, it's more awkward for them.

If the newborn is very young or small, another option is to wrap it in a small soft fabric. Then hold the newborn vertically, right at eye level, so you can see what you are doing. Keep the baby on a heating pad if you set him down.

Put the syringe into the side of its mouth (in the gap between the front teeth & the molars) & eject a small amount of formula. Be sure the syringe is pointed down or to the side (not towards the back of the throat), so the baby does not aspirate. This tends to keep the face clean & to prevent the formula from going

up the split in the lip & into the nose. Also, if the baby holds the formula in his mouth before swallowing, this tends to make him chew the syringe (especially if you wiggle it a bit) which makes him swallow. Another way to make him swallow is to rub his throat.

Another option is to depress the plunger of the syringe just so you can see a small drop of formula coming out. Put the tip of the syringe on the lips or inside the lips a bit (e.g., on the teeth). The baby will then "lick his lips" & thus eat the formula.

Another option, especially after the eyes are open, is to place the syringe near its mouth & squeezed slowly. The baby might lap it up from the syringe tip. This makes the feeding go quicker.

Feeding a very young baby (1-4 days old) with a syringe is very tricky. When feeding a baby this young, it is best to put the syringe in the gap in the teeth, as explained above. If the formula moves up the split in the lip, wipe the mouth/nose with a tissue before giving more formula. To clean up quickly, in the hand that's holding the baby, hold a tissue between your fingers. That way, you can quickly use the other hand to fold it over & wipe his face. That's quicker than having to pick up a tissue each time.

Another option for a very young baby (1-4 days old) is to put the formula on your finger & let the baby lick it off. You can also use the option (described above) of putting a drop of formula on his lips or teeth, but it's much more likely to get formula in its nose that way.

To use the syringe, hold the syringe body with the thumb & first finger, with the end of the plunger resting in the palm of your hand. Move your thumb & first finger toward the palm of your hand to depress the plunger. This position makes it easy to deliver a small & precise amount of formula.

Another option is to place the first & second fingers on the tabs of the body & the thumb on the end of the plunger. Some find this too hard to control.

For some syringes, the rubber on the plunger might stick so the delivery is in spurts. You can lubricate the rubber on the plunger with pediatric simethicone suspension (link at end). Put 1 drop into the syringe body, near the opening. If you put the drop on the rubber part of the plunger, it will just rub off when you insert it into the body. Move the plunger up & down in the syringe to spread the

simethicone around & to expel excess. It is ok for the baby to ingest a small amount of it. You might have to do this before each feeding.

When finished, record how much was eaten. Wipe the baby's face with a wet towel (if eyes are closed, use a dry tissue). Be sure to wipe under the chin & the front paws. The formula is very sticky so none should remain on the baby's body. Using a toothbrush to clean the baby is sometimes useful. You can weigh the baby before & after to see how much the baby drank (as opposed to how much ended up getting on the body). Remember that 1 cc = 1 gram.

After feeding, if their eyes are still closed, stimulate the anal area for 1 – 2 minutes by rubbing with a warm moist towel (or moist cotton ball or wet finger). A towel that is a light color is handy, as it makes it easier to see the yellow pee. This helps them pee and poop. It is ok if they do not pee/poop each time. Babies often squirm during stimulation but when they are actually peeing, they are often still, then squirm when it's over. That's tip off for you to know the baby has peed. Some people do this stimulation before feeding. If this is not done, they might get an over stretched bladder, which would give them medical problems when they get older. They can also develop intestinal tract problems.

The amount to feed depends on the age & weight. Here are numbers for orphaned rabbits (i.e., not getting any milk from mom) for each feeding:

- 0-1 week, 2 to 2-1/2 cc
- 1-2 weeks, 5 to 7 cc
- 2-3 weeks, 7 to 13 cc
- 3-6 weeks, 13 to 15 cc

Some people feed as much as the baby will eat. The belly should be round but not tight. Others say you have to be careful not to overfeed them.

Weigh them at the same time every day when you are hand feeding. Use a gram scale for accuracy (e.g., kitchen or postal scale) (link at end). This is very important. If they are not gaining weight every day, increase the amount you feed. You can either increase the amount per feeding, or the number of feedings per day. If one or more of a litter is not gaining like the rest, that one can be fed more per feeding or more feedings per day. Conversely, if one's weight increases dramatically, that one can then get less food.

Here is a handy spreadsheet to record their weight:

<http://curiousbunny.com/spreadsheets.htm> (then click on "Weight Spreadsheet here").

If babies are healthy, twice a day feeding is recommended. If you are feeding more often & they get diarrhea, change to twice a day feeding. Babies less than 4 days old tend to eat very little during a feeding, thus you might need to feed up to four times a day. For other newborns & very thin babies, you might want to feed three times a day. Once their eyes open, as long as they are gaining weight, feed twice a day. At about 4 weeks, if they are eating pellets & hay (not just nibbling), change the feeding to once a day. If they are just nibbling, not really eating solid food, continue to feed formula twice a day.

When switching to once a day, feed the amount you would normally feed at one feeding (i.e., do not double the amount for the one feeding). That leaves room in their stomach for pellets & hay. When they are about 6 - 7 weeks old, stop feeding the formula. Do not taper down the formula amount. Or you can wait for them to stop eating formula on their own, which generally happens about 6 - 8 weeks of age. Some babies in a litter may stop eating formula before others in the same litter. At any time, if their weight does not continue to increase, feed more formula.

In some cases, you may be hand feeding because you think some or all of the litter are not getting enough milk from the mom. Later on, if things are improving, & you think they are now getting enough milk from the mom, you can stop hand feeding.

When the babies are 4 weeks old or older, you can switch to feeding them in a bowl rather than with a syringe. If younger, there is a risk they can inhale the formula, which can kill them. To tell if they are developed enough, they should be stable on their hind feet when lifting their front feet off the ground to groom. Put the formula in a very low bowl. Watch them to make sure they don't have problems. Have a suction bulb at hand. If they inhale the formula, suction their nose immediately. If you don't have a bulb, use your mouth. Once they finish drinking, remove the bowl. Do not let the bowl stay in their cage when you are not watching. If you leave it in, it is more likely the babies will run through it & bacteria will start to grow in it. Then wipe the baby's face with a wet towel. Be sure to wipe under the chin & the front paws.

Mothers can get pregnant immediately after giving birth, so they can have another litter when the 1st litter is about 4 weeks old. If this happens, be sure to remove the 1st litter. The mom will not have enough milk for both litters & the 1st litter might accidentally injure the 2nd litter. Also, the mom might feed only the 2nd litter. In this case, you'll have to feed the 1st litter by hand. If the unthinkable happens & all of the 2nd litter do not make it, then you can put the mom back with the 1st litter. Watch carefully to make sure she does not harm them, as after being away for awhile, she might not recognize them.

If you have to start feeding babies when they are older than 4 weeks, it's best to not feed from a bowl immediately. Feed them from a syringe at least for a day to make sure they don't have problems. If all is ok, you can then feed from a bowl.

The amount & how long to feed is an inexact science. The most important thing is to monitor their weight. Also, as they get older, notice how many pellets & how much hay they eat. Check their bellies to make sure they are full. Make sure they are active, alert & bright eyed.

Caring For Orphaned Babies

Sometimes there will be babies that have no mother. Or some babies may have a mother but she might have no milk. In these cases, you could hand feed the babies (see How to Hand Feed with a Syringe) or you could find a nursing mother with babies about the same age. The nursing mother could then feed the orphaned babies. This is tricky but sometimes works.

This is also the case for older orphaned babies, about 2 – 3 weeks old. At this age, they might nibble on food. This might give the impression that they can eat on their own. But they will not be getting the calories that they need. They are growing quickly & need sufficient calories. Even at this age, their tummies should feel round & full. If not, they are not getting enough food.

In this discussion, "mother" means the nursing mother, "orphans" means the babies with no mother or with a mother that has no milk, and "original babies" means the babies of the nursing mother.

In the rescue community, what sometimes happens is that babies are orphaned & a call goes out to find a nursing mother. It could be many hours before one is found. By this time the orphans could be starving & cold. Thus, when transporting the orphans to the mother, be extremely vigilant about keeping the babies warm.

Once they arrive, more than likely, they will be cold & starving & need food quickly. First step is to warm them up (see Care of the Newborns). Do not feed them anything until they are warm. If you do, the food will just sit in their stomachs. Also, for the orphans, make sure there is no fur from their biological mom on them, since you don't want her smell on them.

Sometimes, the baby might not have enough energy to nurse. In this case, using a syringe, put 1/2 drop of pure fruit juice (e.g., orange juice, no sugar), at room temperature, on their lips so they can lick it off. Wait 2 minutes. This will increase their blood sugar to give them enough energy to nurse or to accept the supplemental feeding.

Once the babies are warm, they then need food as soon as possible. For this first feeding, it's best to give them a private feeding with the mother (see Private Feeding With Mom). After the feeding, hold the babies next to the mother so she can see them. She might lick them. That means she accepts them. But be very careful. She may reject them & try to harm them. She can tell they are not her babies from their scent.

If the mother accepts the babies, then they can be put into the nest with the original babies. If the mother does not accept the babies, here are some things to try. Keep the orphans separate from the original babies & the mother. Put the fur (or soft fabric) from the original babies' nest in with the orphans. Groom the mother & rub the orphans with that fur & put it in with the orphans. Take the mother out from her original babies & put the orphans in with the original babies (only if they are on a heating pad). Keep them there for awhile to get the original babies' scent on them. Pet the mom to get her scent on your hands, then pet the orphans.

Put a bit of vanilla on the bridge of the nose of each orphan & original babies. This will make them all smell the same. Put a bit of vanilla on the bridge of the nose of the mother. This will make everything smell the same to her. However, this might confuse the mom & she might abandon all the babies.

Use a Q-tip to get the wax from the scent gland that's next to the anus of the mother. Put the wax on the bridge of the nose of each orphan. This will make them smell like her.

Then, once again, hold the babies so the mother can see them, as described above.

Probiotics & Colostrum

In addition to the stomach & intestines, rabbits also have a cecum that is used to digest food. It is the microorganisms in the cecum that actually digest the food. If the babies are nursing from a mother, they will naturally get these microorganisms. However, if the babies are without a mom when they open their eyes, these microorganisms should be added to their diet via **probiotics**. You can get these probiotics in one of two ways: purchase them or get them from cecotropes from a rabbit.

When you purchase them, you can get them in either powder or gel form. The powdered form from HealthyGut for rabbits (link at end) is highly recommended from rabbit savvy vets. For babies, weigh all the babies. Then use 1/2 scoop per 2 pounds (1 kg) of babies. E.g., if you have 1/2 pound (250 g) of babies, use 1/2 scoop * 1/4 = 1/8 scoop. Mix the powder into the formula & feed twice a day.

You can also buy the gel form (e.g., Bene-Bac from PetAg, link at end). In this case, buy the kind labeled as "pet" or any mammal (e.g., dog, cat, equine) (don't get the kind for birds or reptiles). The fat in the gel form protects the probiotics from the digestion process. The powdered form does not have this protection. To feed, put 1/4 gram on your finger so the baby can lick it off. Or you can put the same amount into 1 cc of formula & feed it that way. A small amount of formula is used here to make sure the baby gets all of the probiotics. Feed once a day.

Once the package (gel or powder) is open, it does not expire more quickly (store at room temperature).

Another way to get probiotics is to collect cecotropes from a healthy adult rabbit. This is difficult, but one way is to put an Elizabethan collar (plastic shield used to prevent an animal from scratching its head) on a rabbit at night & collect the cecotropes in the morning. They can be stored in the refrigerator (not freezer) for 3 days. Note that the cecotropes are covered in mucus to protect the microorganisms from the digestion process. Feed each baby 2 – 3 of the cecotrope pellets once a day. To feed, put each individual pellet into the baby's mouth for him to eat. This preserves the mucus which protects the organisms' trip through the stomach. Or put a whole pellet on your finger & offer this to the baby. Another way is to mush the pellets in your fingers & offer them to the

babies. They might eat them. Another way is to put the mashed pellets in 1 cc of formula & hand feed each baby this amount.

Do not use both ways at the same time. The purchased probiotics causes the pH of the stomach to decrease, which will kill the probiotics in the cecotropes. The cecotrope option is much better, as it has the full complement of microorganisms the baby needs.

Start feeding the probiotics 1 or 2 days after the babies open their eyes (which would be at about 11-12 days old). If you wait longer, the pH of the stomach (which gets lower as the baby gets older) might be too acidic for the probiotics to survive the trip to the cecum. For the purchased forms, feed for 3 - 5 days. When using cecotropes, feed for 3 - 4 days. After this, then it's ok to offer the babies solid food. Do not give them solid food before this time. If at any time the babies develop mushy stool or if something happens to stress them, you can give another course of probiotics.

Do not use the purchased kind before the eyes open. This kind lowers the pH in the stomach to help kill off the bad bacteria. If given when the babies are too young, it will lower the pH in the stomach too early in their life.

Colostrum is the first type of milk that the mother produces after she gives birth. Her milk will contain colostrum for up to 3 days. Colostrum is very nutritious & contains antibodies that will help the baby fight disease.

Colostrum can be purchased from a high quality health food store (link at end), in either powdered or capsule form (open capsules to use). Either is fine to use. Even though it is made from cow's or goat's milk, it is fine to use with rabbits.

If the babies had less than 3 days' worth of mother's milk, then they will need colostrum. Add the colostrum to the powdered formula, mix, then add water. In this case, in the calculations below, use the amount of liquid formula that will be created. Or, add the colostrum to the liquid formula & mix.

1 T (15 ml/10 capsules) of colostrum for 1/2 cup (210 ml) liquid formula
1 teaspoon (5 ml/2 capsules) colostrum for 2 T (30 ml) liquid formula
0.5 teaspoon (3 ml/1 capsule) colostrum for 1 T (15 ml) liquid formula

These values are approximate. Don't worry about being exact. No need to split a capsule to get exact values. If you calculate you need half of a capsule, just use the whole capsule.

Let the mixture sit for 15 minutes to let the colostrum soften. If you want to let it sit for an hour or more, refrigerate it during that time. Use the formula within 24 hours.

When hand feeding babies, the nutrition they are getting is not quite up to par with mom's milk, so colostrum is given for a longer time than they would receive from mom. Use the mixture (formula + colostrum) for each feeding for 7 days. It doesn't hurt to use it longer, especially if the baby is not doing well. E.g., you can use it until the babies are 3-4 weeks old or even until they are weaned.

Some babies do not like the taste of colostrum. If they won't feed because of that, then use less of it in the formula, or, as a last resort, stop using it altogether.

If you do not want to buy probiotics and colostrum ahead of time, at least find out what stores in your area sell them. You will then be able to quickly buy them when the need arises.

Dehydration

In very rare cases, a baby rabbit might be dehydrated. To check for dehydration, gently pull up on the skin over the shoulder blades to make a tent. If the skin returns to its normal position immediately, the rabbit is not dehydrated. If it takes a second, it's 5% dehydrated. If it takes more than 5 seconds, it's severely dehydrated. If it never returns to its normal position, it's time to make an emergency trip to the vet.

It's quite subjective to decide if a rabbit is dehydrated enough to take action & rehydrate it. It rarely happens when doing foster care. If you decide a rabbit needs to be rehydrated, do it before feeding it any formula or letting it nurse. There are two rehydration options.

The first option is to give a rehydration solution (like Pedialyte) orally. It should be at room temperature or slightly warm (check on inside of wrist). Give this solution every 30 minutes until the rabbit is no longer dehydrated. While some people are concerned about the effects of the sugar (dextrose) in the solution on a baby rabbit, others have had success in using this type of solution.

Since a bottle of open Pedialyte lasts only 48 hours, it's best to buy a small bottle, or the powdered form. For the later, use tap water, distilled or boiled water (bring to rolling boil & then let cool).

The other option is to give a rehydration solution (e.g., Lactated Ringer's Solution) subcutaneously. The solution should be slightly warm (put bag in warm water) (check on inside of wrist). This should be done only if the rabbit is severely dehydrated, is not active, & is not drinking fluid or formula. Do this procedure every 2 hours until the rabbit is no longer dehydrated. This is a very tricky procedure on a very small rabbit so should only be done if you are trained & have advice from a vet.

A mammal normally drinks about 10% of its body weight a day. Thus, if an animal weighs 1000 grams, it would drink (1000 grams * 10%) 100 grams a day (which equals 100 cc). Use this to calculate the amount of sub-Q fluids to give. Calculate the total for a day, then divide by 3 & use that amount for each session. For a 100 gram baby, total for the day = 100 grams * 10% = 10 cc. Then divide by 3 to get about $10 \text{ cc} / 3 = 3 \text{ cc}$ per session for a 100 gram baby. A dehydrated rabbit may need more than this but don't give too much. Be sure to consult a vet.

Once the baby rabbit is rehydrated, you can then let it feed normally (nursing or hand feeding formula). If you are hand feeding formula, use the ratio of 1:2 (powder:water) as described under "How to Hand Feed with a Syringe". Or, you can use the ratio of 1:1:1 (powder:water:Pedialyte). After the baby is very stable, you can use the ratio 1:1 (powder:water), if desired.

Medical

Some medicine is not given to babies. It is given to the mother who then passes it on to her babies in her milk.

Find a veterinarian nearby who knows how to care for infant rabbits. Ask if they have experience tube feeding infant rabbits. Then, if there's a problem, you'll know where to go.

If any of the following occur, consider seeking immediate medical attention.

body is cold
white poop
green poop

yellow poop
stinky poop
sticky poop
mucus surrounding poop
string of mucus coming out of anus
excess mucus in cecals
diarrhea
weight loss
wrinkly skin
lethargic
eyes not open by 14 days old

A newborn with any of the above symptoms might still be very active. This is deceptive, as it appears the newborn is healthy. This is not the case. The newborn can be quite active but still have major medical problems and go downhill quickly.

The mother should be removed from the babies when they are 8 weeks old so they will stop nursing. To reduce the amount of change in the babies' lives, after the mother is removed, it's best to keep all the babies together. When the babies are 3 months old (3.5 months max), the sexes should be separated. However, if needed, it is fine to separate the babies by sex at 2 months, when they are separated from their mother.

After the mother has not nursed for 2 weeks, then she can be spayed. If she is spayed earlier, because of the milk production, there will be a lot of blood flow in the area around her nipples, which will make the surgery high risk. If any of the following are noticed, then the mom is still producing milk & should not be spayed yet: rope-like ridge under skin connecting nipples on each side; engorged nipples or hot belly.

After the mother has recovered from her spay, she can be put back in with the babies (if needed because of lack of cages).

If cage space is lacking, another alternative is to remove the male babies at 2 – 3 months but keep the female babies with the mother. The mother will often prevent the babies from nursing when it's time to wean them. You can then adopt them together or as singles. The mother & babies often do not bond as a pair.

After a female rabbit is spayed, she should not be with a mature unaltered male for a full 2 weeks. This allows her time to heal inside. Otherwise, if there's penetration before this time, she can be severely injured.

If the mother is spayed when she is nursing (not recommended), she can still produce milk after the surgery.

A rabbit can get pregnant immediately after giving birth. If a male & female are turned into a shelter together, if they are not spayed/neutered, separate them and spay the female as soon as possible, as she is probably pregnant. But sometimes she gives birth before she can be spayed. If the male is still with her, she can then get pregnant again immediately after giving birth. If a mom & litter are turned into a shelter, you may not know the situation where she came from & she could be pregnant.

If you have any adult rabbit (especially male) in the same cage as a female with a litter, remove the other adult rabbit. Otherwise, he/she might hurt the babies. If you have any adult rabbit (especially male) & unaltered female in the same cage, remove the other adult. The female may be pregnant & you should not have the other adult in the cage when the babies are born.

When a litter is born in a shelter, in some cases, none of the babies survive the first day. In this case, the mom probably did not nurse the babies, so there is no extra blood flow in the abdominal area. Thus, she can be spayed very soon after that.

Transportation

It is common in the rescue community to transport newborn rabbits from their place of birth to a foster home. When transporting newborns (especially before their eyes are open), it is extremely important to handle them properly & to keep them warm.

They should all be kept together with the nesting material (usually mom's fur) in a nest box which is in a carrier (or box) which is covered by a towel.

For details, read the article I wrote about Transporting Newborn Rabbits, http://curiousbunny.com/newborn_rabbits_transport.pdf.

Other Information

If a rabbit is bred more than 8 hours after the 1st breeding, she could get pregnant a 2nd time (in the other horn of the uterus). This very rare but if it happens, is harmful for all involved.

The act of giving birth to the entire litter usually takes about 30 minutes, but in rare cases, individual babies can be born up to 48 hours after the first birth.

After giving birth, the mother sometimes will not nurse until the NEXT night.

When nursing, the mother rabbit will stand over the babies. She does not lie on her side like a cat or dog. The babies get underneath her to nurse & often nurse upside down, i.e., they are on their back & their feet are sticking up ... usually kicking wildly. They switch teats every few seconds so it's pretty much bedlam.

Some mothers pull fur even at 5 weeks after birth. That is fine.

When the babies are about 5 - 8 weeks old, the mother might hump them. That is fine. She is letting them know she is the boss.

At about 5 weeks, the babies will be eating & also nursing. At about 7.5 weeks, they may stop nursing, but sometimes they nurse until removed from their mom. It is best to allow the babies to nurse until they are 2 months old. At that time, remove them from the mother to wean them. Also at that time, it's a good idea to separate the sexes so you don't have an "oops" litter. Or, since they don't sexually mature until 3 - 4 months, it's ok to wait until that time to separate the sexes (but be sure to keep track of their age).

Once the babies are removed from the mom, at about 2 months old, sterilize all the equipment. Use either diluted bleach or Rescue Disinfectant. Details, along with product links, are at the end of the Grooming paper.

The mom should be eating alfalfa hay & alfalfa pellets when she's nursing. After nursing has stopped & after she is spayed, keep feeding her alfalfa to get her weight back up. After her weight is at the proper value (maybe 1 month after weaning), you can slowly transition her off alfalfa hay/pellets to grass hay/pellets (e.g., Timothy). Do this by slowly adding more of the new hay/pellets to her diet. Also transition from unlimited pellets to limited pellets.

Keep feeding alfalfa hay & alfalfa pellets to baby rabbits until they are 8 months old. At that time, if their weight is good, you can slowly transition them off alfalfa

to grass hay & pellets (e.g., Timothy). If they are very thin, keep feeding them alfalfa until their weight is good.

This paper describes the care of domestic rabbits, which are descended from the wild rabbits in Europe (*Oryctolagus cuniculus*). Wild rabbits in the United States (*Sylvilagus* species) require surprisingly VERY different care. Care for wild rabbits is discussed in the following links. I'm told these links contain excellent information, although I can't personally vouch for them.

http://curiousbunny.com/other_sites/squirrelworld/RabRehab.html
<https://vetspace.2ndchance.info/everyone-elses-health/how-to-care-for-orphaned-wild-cottontail-bunnies/>

Here's some information to help determine if a rabbit is domestic or wild. The following is a picture of a wild rabbit: <http://www.dreamstime.com/royalty-free-stock-images-wild-baby-rabbit-image6442059> . Wild rabbits are almost always agouti (brown tweed with black ticking). The babies have a small white stripe on their forehead. Their faces are longer & thinner, with a more pointed nose & a wedge shaped head. They are smaller (only up to 3 pounds) & are much more hyperactive & nervous. They have very long slender legs. Their ears are very thin at the tips (translucent) & narrow at the base. The tips of the ears are open almost all the way. Domestic rabbits have a dome-shaped forehead, a more rounded head, more prominent cheekbones (looks like chubby cheeks) & the tips of the ears are folded over a bit (parallel to the length of the ear).

T = tablespoon = 15 ml
teaspoon = 5 ml

Links to Products for Newborn Rabbits

Links to products mentioned in this document are listed here. Note that links to grooming products & other rabbit products are listed at the end of the Grooming paper, http://curiousbunny.com/grooming_your_rabbit.pdf .

portable heating pad, Snuggle Safe
8.5" diameter x 1.25" thick (22 cm diameter x 3 cm thick)
ceramic pad, heat it in microwave
<https://www.amazon.com/Snuggle-Safe-Pet-Microwave-Heating/dp/B00008AJH9/>

heating pad, regular

6 temperature settings; always on option

12"x15" (30 cm x 38 cm) is good size to be under half of nest box

<https://www.amazon.com/Sunbeam-002014-915-000-Xpressheat-Heating-Garnet/dp/B008744QM4/>

heating pad, hard plastic, from K&H

9"x12" (22.9 cm x 30.5 cm), 25 watts

rabbits can't chew it so good when rabbits can contact it

portion of cord protected by metal but might need cord protector in some cases

<https://www.amazon.com/Pet-Products-Extreme-Weather-Petite/dp/B00YGZ7NKK/>

rubber curry comb

to get fur off the fabric from the litter box before washing, spray fabric lightly with water,

then use this comb to remove fur

the one I use is no longer sold but this one looks similar

<https://www.amazon.com/Ewinoom-Grooming-Soothing-Double-Sided-Available/dp/B0B9BSDWH4/>

cage, Marchioro

model #Tommy 120

46.75"L x 22.75"W x 19.75"H (118.75 cm L x 57.75 cm W x 50.25 cm H)

good size & configuration for newborn rabbits

solid plastic on bottom & up 7" (17.8 cm) on sides

discontinued at the moment but might be in stock at some stores

<https://www.amazon.com/Marchioro-Tommy-Animals-inches-Silver/dp/B00A2YHHV4/>

cage, Midwest

model # XL Rabbit Cage

47.16"L x 19.68"W x 23.62"H (119.75 cm L x 50.0 cm W x 60 cm H)

use this if can't find Marchioro

solid plastic on bottom & up 5.5" (14.0 cm) on sides

<https://www.amazon.com/MidWest-Homes-Pets-158-Wabbitat/dp/B07CDXJVP2/>

exercise pen for baby rabbits by Midwest, model #100-29

8 panels, 29" H x 18" W each (74 cm H x 46 cm W)

narrow spacing on bars so babies can't get out

gap between bars = 0.827" (21.006 mm)

<https://www.amazon.com/MidWest-Homes-Pets-Animal-Exercise/dp/B007Z58IFC>

gram scale (also shows pounds/ounces)

measures up to 11 pounds (5 kg)

handy display that sides out in case your box with bunny is large

<https://www.amazon.com/OXO-Grips-Stainless-Pull-Out-Display/dp/B079D9B82W/>

high sided litter box

17.5"L x 15"W x 8.5"H (44.5 cm L x 38 cm W x 21.5 cm H)

good for use as a nest box

https://www.amazon.com/Van-Ness-Litter-Assorted-Colors/dp/B001FKC390?ref =ast_sto_dp

Litter Saver Nest Filler

fake fur to add to nest box

<https://www.kwcages.com/litter-saver-nest-filler.html>

waterproof blankie 27" x 50" (69 cm x 127 cm)

useful if you want to play with the babies on the couch

<https://www.amazon.com/Flannel-Protector-Resistant-Mattress-Waterproof/dp/B07JG66CTY/>

suction bulb to clear nose, 1 oz/30 ml

<https://www.amazon.com/Syringe-Hand-Washing-Squeeze-Adults/dp/B08P8S35WQ/>

Miracle Nipple

<https://miraclenipple.com/>

baby formula, Wombaroo

search for Rabbit Milk Replacer

<https://wombaroo.com/>

baby formula, Fox Valley

search for Day One 32/40 (milk replacer for rabbits)

<https://foxvalleynutrition.com/>

baby formula, PetAg

search for Esbilac for puppies or KMR for kittens or Zoologic

<https://www.petag.com/>

simethicone

this brand has a handy eye dropper

<https://www.amazon.com/dp/B01GPEP806/>

probiotics, powdered, HealthyGut

<https://www.amazon.com/HealthyGut-Probiotics-for-Rabbits-120/dp/B07TCVKLJ1>

probiotics, gel, Bene-Bac by PetAg

<https://www.petag.com/products/bene-bac-plus-small-animal-gel>

colostrum, capsules

<https://www.vitaminshoppe.com/p/super-strength-colostrum-40-igg-120-capsules/vs-1756>

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