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BREEDING DOGS AND RAISING PUPPIES

Breeding dogs and raising puppies can be an extremely rewarding experience or it may produce frustration and failure. The following information is provided in order to increase your chances of success.

How often does a female dog come into heat?

The female dog comes into heat (estrus) about every six months, although very large breeds of dogs may cycle every 8-10 months. The heat period lasts about three weeks.

What are the signs of heat?

The most notable sign of heat is vaginal bleeding. This begins about the end of the first week of estrus and lasts for about 10-14 days. Another consistent sign is swelling of the vulva. During estrus male dogs will be attracted to her.

What should I do to be sure that a breeding is accomplished successfully?

Male dogs are more successful breeders when the environment is familiar. Therefore, it is preferable to take the female to the male's home for breeding. The timing for breeding is critical. The most fertile time is considered the 10th through the 14th days of estrus; however, some dogs will be fertile as early as the 3rd day and as late as the 18th day.

Are there tests to determine when to breed?

There are two tests that are used for this purpose. The first is a microscopic examination of vaginal cells to detect changes to cell appearance and numbers. This has been used for many years and is reasonably reliable.

A newer test determines changes in the progesterone level in the blood. This test is more accurate, and more expensive than monitoring vaginal cells. It is used for dogs that have a history of unsuccessful breeding or for dogs that are very valuable breeders.

What should I expect during my dog's pregnancy?

Pregnancy, also called the gestation period, ranges from 60 to 67 days, averaging 63 days. Most dogs deliver (whelp) between days 63 and 65. The only way to accurately determine the stage of pregnancy is to count days from the time of breeding. If possible, the breeding date(s) should be recorded. The mother should be examined three weeks after breeding to confirm her pregnancy.

A pregnant dog should be fed a puppy formulation of a premium brand of dog food for the duration of the pregnancy and through the nursing period. These diets are generally available through veterinary hospitals or pet stores. Puppy diets provide all the extra nutrition needed for the mother and her litter. If the mother is eating one of these diets, no calcium, vitamin, or mineral supplements are needed. The puppy formulation is necessary to provide the extra nutrients for pregnancy and nursing.

During pregnancy, the mother's food consumption will often reach 1½ times her level before pregnancy. By the end of the nursing period, it may exceed two times the pre-pregnancy amount. Do not withhold food; increasing the number of feedings per day is helpful in allowing her to eat enough for her needs and those of the puppies.

What should I do to prepare for whelping?

From the time of breeding, many dogs show behavioral changes. Most develop an unusually sweet and loving disposition and demand more affection and attention. However, some may become uncharacteristically irritable. Some experience a few days of vomition ("morning sickness"), followed by the development of a ravenous appetite which persists throughout the pregnancy.

During the latter stages of pregnancy, the expectant mother begins to look for a secure place for delivery. Many become uncomfortable being alone and will cling closely to the owner. At the onset of labor, many nervously seek a place to make the "nest" or birthing place. If the dog is attached to her owner, she will not want to be left alone at the time of delivery. If left alone, she may delay delivery until the owner returns.

Prior to the time of delivery, a whelping box should be selected and placed in a secluded place, such as a closet or a secluded corner. The box should be large enough for the dog to move around freely, but have low enough sides so that she can see out and so you can reach inside to give assistance, if needed. The bottom of the box should be lined with several layers of newspapers. These provide a private hiding place for the expectant and delivering mother and will absorb the birthing fluids. The upper, soiled layers may be removed with minimal interruption to the mother and her newborn puppies.

What happens during labor and delivery?

Most dogs experience delivery without complications; however, first-time mothers should be attended by their owners until at least one or two puppies are born. If these are born quickly and without assistance, further attendance may not be necessary, although it is desirable. If the owner elects to leave, care should be taken so that the dog does not try to follow and leave the whelping box.

The signs of impending labor generally include nervousness and panting. The dog will often quit eating during the last 24 hours before labor. She will also usually have a drop in rectal temperature below 100°F (37.8°C). The temperature drop may occur intermittently for several days prior to delivery, but it will usually be constant for the last 24 hours.

Delivery times will vary. Dogs having slim heads, such as Shelties, Collies, and Dobermans, may complete delivery in one to two hours. Dogs having large, round heads generally require longer delivery times. English Bulldogs, Boston Terriers, and Pekinese puppies tend to have sizable heads that make delivery more difficult. It is not unusual for these breeds to rest an hour or more between each puppy. Rarely, a dog may deliver one or two puppies, then have labor stop for as long as twenty-four hours before the remainder of the litter is born. However, if labor does not resume within a few hours after the delivery of the first puppies, examination by a veterinarian is advised. If labor is interrupted for twenty-four hours or more, veterinary assistance should definitely be obtained.

Puppies are usually born head first; however, breech presentations, in which the puppy is delivered tail-end first, occur about 40% of the time and are also considered normal. Each puppy is enclosed in a sac that is part of the placenta ("afterbirth"). The placentas usually pass after the puppies are born. However, any that do not pass will disintegrate and pass within 24-48 hours after delivery. It is normal for the mother to eat the placentas.

If the delivery proceeds normally, a few contractions will discharge the puppy; it should exit the birth canal within ten minutes of being visible. Following delivery, the mother should lick the newborn's face. She will then proceed to wash it and toss it about. Her tongue is used to tear the sac and expose the mouth and nose. This vigorous washing stimulates circulation, causing the puppy to cry and begin breathing; it also dries the newborn's haircoat. The mother will sever the umbilical cord by chewing it about $\frac{3}{4}$ to 1 inch (1½ to 2 cm) from the body. Next, she will eat the placenta.

If the puppy or a fluid-filled bubble is partially visible from the vagina, the owner should assist delivery. A dampened gauze or thin wash cloth can be used to break the bubble and grasp the head or feet. When a

contraction occurs, firm traction should be applied in a downward (i.e., toward her rear feet) direction. If reasonable traction is applied without being able to remove the puppy, or if the mother cries intensely during this process, the puppy is probably lodged. A veterinarian's assistance should be sought without delay.

It is normal for the mother to remove the placental sac and clean the puppies; however, first-time mothers may be bewildered by the experience and hesitate to do so. If the sac is not removed within a few minutes after delivery, the puppy will suffocate, so you should be prepared to intervene. The puppy's face should be wiped with a damp wash cloth or gauze to remove the sac and allow breathing. Vigorous rubbing with a soft, warm towel will stimulate circulation and dry the hair. The umbilical cord should be tied with cord (i.e., sewing thread, dental floss) and cut with clean scissors. The cord should be tied snugly and cut about ½ inch (1 cm) from the body so it is unlikely to be pulled off as the puppy moves around the whelping box.

Newborn puppies may aspirate fluid into the lungs, as evidenced by a raspy noise during respiration. This fluid can be removed by the following procedure. First, the puppy should be held in the palm of your hand. The puppy's face should be cradled between the first two fingers. The head should be held firmly with this hand, and the body should be held firmly with the other. Next, a downward swing motion with the hands should make the puppy gasp. Gravity will help the fluid and mucus to flow out of the lungs. This process may be tried several times until the lungs sound clear. The tongue is a reliable indicator of successful respiration. If the puppy is getting adequate oxygen, it will appear pink to red. A bluish colored tongue indicates insufficient oxygen to the lungs, signaling that the swinging procedure should be repeated.

It may be helpful to have a smaller, clean, dry box lined with a warm towel for the newborn puppies. (A towel can be warmed in a microwave oven.) After the puppy is stable and the cord has been tied, it should be placed in the incubator box while the mother is completing delivery. Warmth is essential so a heating pad or hot water bottle may be placed in the box, or a heat lamp may be placed nearby. If a heating pad is used, it should be placed on the low setting and covered with a towel to prevent overheating. A hot water bottle should be covered with a towel. Remember, the newborn puppies may be unable to move away from the heat source. Likewise, caution should also be exercised when using a heat lamp.

Once delivery is completed, the soiled newspapers should be removed from the whelping box. The box should be lined with soft bedding prior to the puppies' return. The mother should accept the puppies readily and recline for nursing.

The mother and her litter should be examined by a veterinarian within 24 hours after the delivery is completed. This visit is to check the mother for complete delivery and to check the newborn puppies. The mother may receive an injection to contract the uterus and stimulate milk production.

The mother will have a bloody vaginal discharge for 3-7 days following delivery. If it continues for longer than one week, she should be examined by a veterinarian for possible problems.

What happens if my dog has trouble delivering her puppies?

Although most dogs deliver without need for assistance, problems do arise which require the attention of a veterinarian. Professional assistance should be sought if any of the following occur:

- 1) Twenty minutes of intense labor occurs without a puppy being delivered.
- 2) Ten minutes of intense labor occurs when a puppy or a fluid-filled bubble is visible in the birth canal.
- 3) The mother experiences sudden depression or marked lethargy.
- 4) The mother's body temperature exceeds 103°F (39.4°C) (via a rectal thermometer).
- 5) Fresh blood discharges from the vagina for more than 10 minutes.

Difficulty delivering (dystocia) may be managed with or without surgery. The condition of the mother, size of the litter, and size of the puppies are factors used in making that decision.

Is premature delivery a likely problem?

Occasionally, a mother will deliver a litter several days premature. The puppies may be small, thin, and have little or no hair. It is possible for them to survive, but they require an enormous amount of care, since they are subject to chilling and are frequently very weak and unable to swallow. Some may be able to nurse but are so weak that they must be held next to the mother. Puppies that do not nurse can be fed with a small syringe, bottle, or stomach tube. The equipment and instructions for these procedures are available from a veterinarian. Premature puppies must be kept warm. The mother can provide sufficient radiant heat from her body if she will stay close to them. If she refuses, heat can be provided with a heat lamp, heating pad, or hot water bottle. Excessive heat can be just as harmful as chilling, so any form of artificial heat must be controlled. The temperature in the box should be maintained at 85° to 90°F (29.4° to 32.2°C), but the box should be large enough so the puppies can move away from the heat if it becomes uncomfortable.

Is it likely that one or more puppies will be stillborn?

It is not uncommon for one or two puppies in a litter to be stillborn. Sometimes, a stillborn puppy will disrupt labor, resulting in dystocia. At other times, the dead puppy will be born normally. Although there is always a cause for this occurrence, it is often not easily determined without an autopsy that includes cultures and the submission of tissues to a pathologist. This is only recommended in special circumstances.

What do I do to care for the newborn puppies?

The mother will spend most of her time with the puppies during the next few days. The puppies need to be kept warm and to nurse frequently; they should be checked every few hours to make certain that they are warm and well fed. The mother should be checked to make certain that she is producing adequate milk.

If the mother does not stay in the box, the puppies' temperatures must be monitored. If the puppies are cold, supplemental heating should be provided. During the first four days of life, the newborns' box should be maintained at 85° to 90°F (29.4° to 32.2°C). The temperature may gradually be decreased to 80°F (26.7°C) by the seventh to tenth day and to 72°F (22.2°C) by the end of the fourth week. If the litter is large, the temperature need not be as high. As puppies huddle together, their body heat provides additional warmth.

If the mother feels the puppies are in danger or if there is too much light, she may become anxious. Placing a sheet or cloth over most of the top of the box to obscure much of the light may resolve the problem. An enclosed box is also a solution. Some dogs, especially first-time mothers, are more anxious than others. Such dogs may attempt to hide their young, even from her owner. Moving from place to place may continue and will endanger the puppies if they are placed in a cold or drafty location. Dogs with this behavior should be caged in a secluded area. This type of mother has also been known to kill her puppies as a means of "protecting" them from danger.

What are the signs that the puppies are not doing well and what do I do?

Puppies should eat or sleep 90% of the time during the first 2 weeks. If they are crying during or after eating, they are usually becoming ill or are not receiving adequate milk. A newborn puppy is very susceptible to infections and can die within 24 hours. If excessive crying occurs, the mother and entire litter should be examined by a veterinarian promptly.

When the milk supply is inadequate, supplemental feeding one to three times per day is recommended and should be performed on any litter with 5+ puppies. There are several commercial formulae available that are made to supply the needs of puppies. They require no preparation other than warming. They should be warmed to 95° to 100°F (35.0° - 37.8°C) before feeding. Its temperature can be tested on one's forearm; it should be about the same as one's skin. An alternative is canned goats' milk that is available in most grocery stores. The commercial products have directions concerning feeding amounts. If the puppies are still nursing from their mother, the

amounts recommended will be excessive. Generally, 1/3 to 1/2 of the listed amount should be the daily goal. Supplemental feeding may be continued until the puppies are old enough to eat puppy food.

If the mother does not produce milk or her milk becomes infected, the puppies will also cry. If this occurs, the entire litter could die within 24 to 48 hours. Total replacement feeding, using the mentioned products, or adopting the puppies to another nursing mother is usually necessary. If replacement feeding is chosen, the amounts of milk listed on the product should be fed. Puppies less than two weeks of age should be fed every 3-4 hours. Puppies 2-4 weeks of age do well with feedings every 6-8 hours. Weaning, as described below, should begin at 3-4 weeks of age.

What should I expect during the puppies' first few weeks of life?

For the first month of life, puppies require very little care from the owner because their mother will feed and care for them. They are born with their eyes closed, but they will open in 7 to 14 days. If swelling or bulging is noted under the eyelids, they should be opened gently. A cotton ball dampened with warm water may be used to assist opening the lids. If the swelling is due to infection, pus will exit the open eyelids and should be treated as prescribed by a veterinarian. If the eyes have not opened within 14 days of age, they should be opened by a veterinarian.

Puppies should be observed for their rate of growth. They should double their birth weight in about one week.

At two weeks of age, puppies should be alert and trying to stand. At three weeks, they generally try to climb out of their box. At four weeks, all of the puppies should be able to walk, run, and play.

Puppies should begin eating solid food about 3½ to 4½ weeks of age. Initially, one of the milk replacers or puppy food that has been soaked in water to make a gruel should be placed in a flat saucer. The puppies' noses should be dipped into it two or three times per day until they begin to lap; this usually takes 1-3 days. Next, canned or dry puppy food should be placed in the milk replacer or in water until it is soggy. As the puppies lap, they will also ingest the food. The amount of moisture should be decreased daily until they are eating the canned or dry food with little or no moisture added; this should occur by 4 to 6 weeks of age.

I have heard of milk fever. What exactly is it?

Eclampsia, or milk fever, is a depletion of calcium from the mother due to heavy milk production. It generally occurs when the puppies are 3-5 weeks old (just before weaning) and most often to mothers with large litters. The mother has muscle spasms resulting in rigid legs, spastic movements, and heavy panting. This can be fatal in 30-60 minutes, so a veterinarian should be consulted immediately.

Do puppies need a special diet?

Diet is extremely important for a growing puppy. There are many commercial foods specially formulated for puppies. These foods meet their unique nutritional requirements and should be fed until 12-18 months of age. Puppy foods are available in dry and canned formulations. Dry foods are less expensive and can be left in the bowl for the puppy to eat at will. Canned foods offer a change and are just as nutritious.

We recommend that you buy FOOD FORMULATED FOR PUPPIES. Adult formulations are not recommended since they do not provide the nutrition required for a puppy. Advertisements tend to promote taste rather than nutrition, so one should be careful that their influence on purchasing habits is not detrimental to one's dog. Generic foods should be avoided. Table food is not recommended; although often more appealing than dog food, balanced, complete nutrition is usually compromised.

We recommend that you buy NAME BRAND FOOD. It is generally a good idea to avoid generic brands of food. We recommend that you only buy food which has the AAFCO (American Association of Feed Control Officials) certification. Usually, you can find this information very easily on the food label. AAFCO is an organization

which oversees the entire pet food industry. It does not endorse any particular food, but it will tell you if the food has met the minimum requirements for nutrition which are set by the industry. Most of the commercial pet foods will have the AAFCO label. In Canada, look for foods approved by the Canadian Veterinary Medical Association (CVMA).

When should vaccinations begin?

Puppies are provided some immunity to canine diseases before and shortly after birth. The mother's antibodies cross the placenta and enter the puppies' circulation. Some antibodies are also provided in the mother's milk. These "maternal antibodies" protect the puppies against the diseases to which the mother is immune. This explains why it is desirable to booster the mother's vaccinations within a few months prior to breeding.

Although very protective, maternal antibodies last for only a few weeks; after this time, the puppy becomes susceptible to disease. The vaccination program should be started at about six to eight weeks of age. Puppies should be vaccinated against distemper, hepatitis, leptospirosis, parainfluenza virus, parvovirus, coronavirus, and rabies. Other vaccines are also available for certain situations, and will be discussed at the time of the first visit for vaccinations.

Maternal antibodies are passed in the mother's milk only during the first 1-3 days after delivery. If, for any reason, the puppies do not nurse during this important period of time, their vaccinations should begin about two to four weeks of age, depending on likely disease exposure. A veterinarian can make specific recommendations for each particular situation.

Do all puppies have worms?

Intestinal parasites ("worms") are common in puppies. Symptoms include a general poor condition, chronic soft or bloody stools, loss of appetite, a pot-bellied appearance, loss of luster of the haircoat, and weight loss. Some parasites are transmitted from the mother to her offspring and others are carried by fleas. Some are transmitted through the stool of an infected dog. Very few of these parasites are visible in the stool, so their eggs must be detected by the veterinarian with a microscope.

A microscopic examination of the feces will reveal the eggs of most of these parasites. Generally this test should be performed at the time of the first vaccinations. However, it may be performed as early as three weeks of age if a parasite problem is suspected. Treatment is based on the type of parasites found although some veterinarians elect to treat all puppies because they know that fecal tests can be falsely negative. Your veterinarian should be consulted for specific recommendations for your puppies.