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## Reproduction in dogs – from mating the dogs to raising the pups

### BEFORE YOU BREED

Breeding dogs is not something to be entered into lightly – it is worth doing your research before you decide to breed. If you read through the next few points and it sounds too hard or expensive then breeding is not something you should choose to do.

- Prior to breeding all dogs should have had a thorough physical exam performed by a vet to check for any physical abnormalities that may prevent them from breeding successfully and to check for abnormalities they may pass onto their pups. Some dogs should also have DNA tests done to make sure they are not carrying genes that may pass on problems to their pups.
- **All large breeds and other susceptible breeds should have their hips and elbows x-rayed and scored under anaesthetic before breeding is considered.** Only dogs with better hips and elbows than the breed average should be used to breed.
- You also need to consider the temperament of your dog – only dogs with good temperaments should be used for breeding.
- **Be prepared for possible complications** during pregnancy, whelping and lactation. Difficulties in giving birth requiring a caesarian; mastitis and milk fever are all complications that often occur and can be very costly (some of these problems can cost well over \$1000).
- Be prepared to have all the puppies vaccinated and wormed prior to sale – this can be a considerable expense in a large litter.
- **Before you breed make sure that there is a market for the pups you will produce** – large dogs often have large litters (12 or more pups) that you will need to find homes for. If your dog is large and is not purebred it is very likely you will have trouble finding homes for the pups. Crossbred dogs can make great pets but it is hard to predict what the pup will grown up to be like and there are many crossbred pups available from accidental matings so finding homes can be difficult.

### PREVENTING PREGNANCY

- If you do not want to breed your bitch/dog at all you should have them desexed at around 6 months of age. If done around 6 months of age (or before their first heat in females) this prevents problems such as uterine infections, ovarian cancer and testicular cancer. It also reduces the chance of prostate problems and mammary cancers.
- If you intend to breed your dog later you have 2 options. You can keep males and females separate while females are on heat – this is usually the best option if possible. Alternatively there are hormone implants that can be used in males or females that temporarily sterilize them (usually they last 6-12 months but this can be variable). This option should be discussed with your vet to see if it is appropriate for your situation.
- If your bitch is accidentally mated there is an abortion injection available to terminate the pregnancy. If given early it is very effective. It should generally be given as soon as the bitch is off heat (if she is still on heat she may be mated again!) but can be given up to 6 weeks after mating however, the later it is given the less effective it is.

### AGE TO BREED

- Most dogs reach puberty between 6-9 months, females will first come on heat at this age and they can become pregnant. However, most dogs are not fully grown themselves at this age and should not be allowed to become pregnant this young.
- The best age to breed dogs depends on their size – for smaller breeds they should be 12-18 months, larger breeds should be more than 2 years old.

## **BITCHES ON HEAT**

- Bitches come on heat approximately every 6 months and are on heat for 2-3 weeks.
- During heat the vulva will swell and there will be a bloody discharge, after 10-14 days this discharge may change or stop – some dogs the discharge will look the same for a full 3 weeks.
- During their heat a bitch will ovulate and can become pregnant.

## **MATING**

- After 10-14 days on heat the bitch becomes receptive to the male and mating should occur if the bitch has access to a male.
- If you are supervising mating or having artificial insemination performed to breed your bitch you will need to have blood tests (or sometimes swabs from the vagina) done from about 1 week after their heat starts and then every few days. This is to identify when the bitch is due to ovulate and allow the mating or artificial insemination to be done at the correct time.

## **PREGNANCY LENGTH**

- Pregnancy will last 63 days (with variations of 58 – 72 days)

## **PREGNANCY TESTING**

- Ultrasound can be performed from day 28 after mating. This is accurate to determine if a bitch is pregnant or not but counting the number of pups can be difficult.
- An X-ray can be performed from day 42 after mating – this is a better technique for estimating how many puppies can be expected. (for more accurate counting number of puppies this is more reliable after day 56 or within one week of expected due date).
- Manual palpation may be possible in some dogs from day 42
- A blood test can also be offered between 38 and 48 days, but accurate mating dates are required. This is usually the most expensive and often least accurate option and is rarely done.

## **HEALTH DURING PREGNANCY**

### **• Exercise**

Normal exercise routine for the first 35 days of pregnancy then taper off as whelping date approaches.

### **• Diet**

See attached feeding information.

### **• Vaccination**

Ensure all vaccinations are current prior to mating. Most vaccines are not safe in pregnant dogs so it is important to ensure bitches are vaccinated prior to mating so the pups are protected at birth.

### **• Worms and fleas**

The pregnant dog and her unborn puppies need to be protected from parasites to ensure good growth and vitality. You must provide monthly worm and flea control including heartworm. By treating the mother during pregnancy and lactation you will be providing protection for the puppies. Ensure that you give the correct dose to cover the increasing body weight of your dog. Please see the clinic staff for products that are safe in the pregnant and lactating bitch.

Once the puppies are born there are also products available from the clinic that are safe from a young age.

## **PREPARATION FOR BIRTH**

- Whelping box - a suitable site should be set up for birthing the puppies. The site should be warm and quiet and away from draughts, but still somewhere that can be monitored. The box also needs to be lined with newspaper and towels so it can easily be cleaned after the birth. It needs to be large enough that the bitch can move around freely and the sides need to be high enough to contain the puppies but low enough the bitch can easily get in and out. During the last 2 weeks of pregnancy the bitch should be exposed to the birthing site and ideally should be sleeping there so that she feels comfortable and familiar with the area.

- Long haired breeds should have hair around the vulva clipped or tied up out the way. Some times clipping around the mammary glands may be necessary to make sure the pups can easily access the teats to feed.
- Hot water bottles (not too hot), heat lamps or heating pads should be close by to keep the bitch and puppies warm.
- Where possible bitches should be supervised during whelping – this is particularly important for first time mothers. Although supervision is important to monitor for problems excessive interfering with the bitch or fussing over her is not helpful in many cases.

## BIRTH

- **Signs of labour**

- A temperature drop – rectal temperature will drop by 1°C from normal temperature at 18 – 24 hours prior to birth. Normal temperature is 38-39°C, temperature needs to be taken regularly for this to be a useful indicator, as it will increase again prior to birth.
- Mammary gland development and milk production
- Passing of a clear to cream coloured mucus plug
- Relaxation of the vulval area.
- The bitch may stop eating and appear nervous and panting 24h before going into labour.

- **Whelping – there are 3 stages of whelping:**

- **Stage one**
- the bitch may become restless and start showing a strong tendency to nest
- it may last 6-12 hours
- the heart and respiration rate may increase
- uterine contractions begin and the first pup is presented into the cervix.
- **Stage two**
- The first pup is usually born within 1 hour of strong straining. Once you can see a pup or sac it should be delivered within 10 minutes. If this does not occur you may be able to assist by breaking the sack, grasping the head or feet and pulling the pup out yourself using firm downward pressure as the bitch contracts. If you are unable to get the pup out you will need veterinary assistance.
- The interval between pups may include a rest period of 5 minutes to 3 hours. Provided there is no unproductive strong straining a long rest period can be normal.
- A common birth pattern is to produce 2 or 3 puppies at short intervals (ie 10 – 30 minutes apart) then have a rest phase of 1 to 3 hours before repeating the process.
- Pups are usually born with the part of the embryonic sac covering them, which the bitch will normally lick off.
- If the bitch is not removing the pup from the sac immediately you should assist as they cannot breathe until the sac is removed so will suffocate if left like this more than a few minutes. Once out of the sac you should rub the pup vigorously with a towel until it cries and moves around. Tie off the umbilical cord with some cotton or dental floss and cut the cord. Place the pup in a warm dry area or with the bitch if she will accept it.
- Pups are often born head and front legs first although tail and hindlimbs first is also normal. Breech presentation (bottom first) is not normal and although pups may still be successfully delivered this way problems are more frequent as the pup often gets stuck.
- There is a **green** discharge associated with the birth of puppies; this is **normal** (if there is green discharge and no puppy then this is abnormal – see below).
- The bitch will clean away membranes, placenta and umbilical cord. She will normally eat the placenta
- Care should be taken **not** to unnecessarily interfere with the bitch and her puppies as it can sometimes upset them and inhibit the birth.
- After whelping, if bitch refuses to mother the puppies then call the vet clinic for further advice.
- **Final Stage**
- Expulsion of the placentas. This can happen within 5 –15 minutes or immediately after each pup is born.
- Over the next 3-5 weeks the bitch may have a red brown discharge, this is normal and represents closing down of the uterus.

### WHEN SHOULD I CALL THE VET

- **Failure to start labour on the due date**
- **If the bitch is bright and alert and there is no vaginal discharge and the pups are moving then it is safe to wait.**
- **Failure to progress in normal labour**
- **Strong and frequent straining that fails to produce a puppy within 20 minutes**
- **Weak or intermittent straining that fails to produce a pup within 3 hours (for the first pup) or 2 hours (between pups)**
- **Partial delivery of a puppy**
- **If a puppy becomes stuck in the vulva**
- **If a greenish-blackish discharge appears without the arrival of a puppy within 1 hour – then placental separation has occurred and indicates a birthing problem.**

### CARE OF THE NEWBORN PUPPIES

- New born puppies need to be kept warm and in a quiet, draft free area.
- After the puppies are born and cleaned the mother should be happy for all pups to suckle while she rests.
- We recommend that a vet check the bitch and puppies within 48 hours of birth.
- The bitch will leave her puppies periodically to toilet and eat/drink, however she will return promptly if puppies start to unsettle and make noise. It is necessary to watch her for mothering as some can excessively clean pups and start to mutilate/eat them. Also laying on them, standing on them and even not wanting to feed them are all issues that need to be addressed if they occur. It may be necessary to even hand raise pups that are in serious threat of injury or death.
- If the litter is very large or the bitch does not have enough milk the pups may need to be supplementary fed or even hand raised.
- Puppies should be weighed regularly and weights recorded to make sure they are putting on weight – initially weight them every few days then once a week. They should double their birth weight in the first week
- Puppies are born with their eyes closed and they remain closed for 7-14 days. As the eyes are opening there may be some discharge you will need to gently wipe with some warm water and a soft cloth.
- Puppies should be alert and trying to stand at 2 weeks of age and at 3 weeks they usually start to try and climb out of their box. By 4 weeks of age they should be able to walk, run and play.

### HANDREARING PUPPIES

- Handrearing puppies can be a lot of work especially if there are a lot of puppies. It will involve getting up in the night to feed them for the first 2-3 weeks.
- If you are just supplementary feeding the pups the bitch will still do most of the work but if the pups are no longer with the bitch you will need to do everything for them that their mother would normally do.
- Pups must be kept in a warm dry place. An external heat source such as a heat lamp, hot water bottle or heat mat will be required. Care must be taken it doesn't get too hot and burn the pups – always make sure any heat mat or hot water bottle is covered and remains dry. The pups should have space to crawl away from the heat if it gets too hot for them.
- Puppies need to be fed a commercially available milk replacer such as wombaroo or divetelac. They come as a powder and are made up with water as required according to the guidelines on the packet. The packet should also explain how much to feed per day and from this you can work out how much to give each feed. The amount should be measured and pups should not be over or under fed – body weight will also help guide this.
- Puppies need to be fed milk at body temperature – squirt a bit on the front of your wrist prior to feeding them to make sure the milk is not too hot or too cold.
- Milk needs to be fed from a bottle with a special teat, a small hole needs to be made in the teat that may need to be made larger as the pup gets bigger.

- Young puppies need to be fed every 2-3 hours for the first 4-7 days, feeding can then be spread out to every 4 hours until they are 2-3 weeks old. Once they are eating solids they can be bottle fed every 6-8 hours, reducing to once or twice a day as they are completely weaned.
- Hand raised puppies can be completely weaned as soon as they are eating adequate solids. Weaning should be performed as described below for puppies with their mothers.
- Puppies being hand raised also need to be stimulated to go to the toilet – their mothers would usually do this by licking them. You can do it by using some cotton wool or soft tissues slightly moistened with warm water. Their genital areas need to be gently rubbed with the moist tissues/cotton to stimulate them to urinate and defecate. Puppies need to be toileted after each feed for the first 2-3 weeks.

## **WEANING**

- Puppies should be weaned starting when they are 2-3 weeks of age. Once their eyes are open they can be offered milk replacer on a saucer and encouraged to lap.
- When they are 3-4 weeks old they can be started on canned food or soaked kibble. The amount of food they are eating should be gradually increased and they should slowly drink less milk. Puppies can be completely weaned between 4-6 weeks of age.
- Once they are completely weaned they can be transitioned off wet/soaked food and onto dry kibble. The dry food should be good quality and especially for puppies. Ideally the food should be tailored to small, medium or large breeds as different sized pups have different requirements as they grow. Puppies can stay on this food until they are 12 months old for small breeds, 18-24 months for large breeds.
- There is generally not any need to add any additional supplements to a puppy's food if they are on a good quality puppy diet. In some cases adding supplements can actually cause problems.

## **VACCINATING AND WORMING THE PUPPIES**

- Puppies should be wormed every 2 weeks from 2 weeks of age until they are 12 weeks of age. Liquid wormers are available to make this process easier.
- Puppies should receive their first vaccinations at 6-8 weeks of age with boosters at 10-12 weeks of age. It is vital that puppies that have not received a full course of vaccinations yet are kept away from any dogs that may be unvaccinated or sick. Puppies should be vaccinated as early as possible if they did not get milk from their mother or if the mother was not vaccinated.

## **POSSIBLE COMPLICATIONS IN THE BITCH AFTER GIVING BIRTH**

- **Milk fever** – usually in small breeds, often with large numbers of pups at week 2-4 of lactation although may be seen any time during later pregnancy or during lactation. It is caused by low calcium levels in the blood. Sometimes calcium supplements may be used AFTER a bitch has had pups to prevent milk fever. Using it prior to her giving birth actually makes her more likely to get milk fever. Symptoms include muscle spasms, panting and twitching, it can progress to seizures. Treatment is required **immediately** as this condition can cause death if left untreated too long (sometimes 30-60 minute delay can result in death).
- **Mastitis** – this is an infection in the mammary glands and can occur at any stage of lactation but is more likely as the puppies are being weaned. Symptoms include red hot or lumpy mammary glands, nipples may have bloody or pus like discharge, sometimes an abscess can form and burst. The bitch may be well or she may be very sick with a high fever. Most cases just require antibiotics but the infection can be very serious and even life threatening in a few cases so prompt treatment is essential.
- **Metritis** – this is an infection in the uterus and can occur at any time after giving birth. Sometimes it can be caused by a retained placenta. Some blood tinged discharge is normal after giving birth for 3-5 weeks, if this discharge is excessive or smelly it may indicate metritis. If the bitch is unwell it may also indicate metritis.
- **Bleeding, retained puppies or uterine rupture** – these are not common complications but are all very serious. They will be usually be evident soon after or as the bitch is giving birth. If the bitch is unwell, bleeding excessively, straining excessively or still appears to have undelivered puppies inside her she should be seen immediately by a vet.

### **Feeding the pregnant bitch**

## Conception through gestation

The gestation period for a dog is around 9 weeks – 63 days.

From conception pregnant bitches should be feed puppy food as it is more nutrient dense. Feed the recommended maintenance level for her weight.

Small Breed dogs – Small Breed Puppy  
Medium Breed Dogs – Medium Breed Puppy  
Large Breed dogs – Premium Performance Large Breed  
Giant Breed dogs – Premium Performance Large Breed

Weeks 1-6: foetuses do not grow significantly. Feed normal feeding amounts of puppy formula.

Week 7: start to increase the amount of food gradually until you are feeding 1.5 times normal amounts by the end of gestation. This will support the rapid growth of the foetuses during the last 3 weeks.

As a dogs stomach may not be able to expand sufficiently to accommodate this meal size she will need to be fed more frequently.

At the time of whelping and the day following, bitches frequently lose their appetite. Keeping nutrient dense, highly palatable foods available at this time is beneficial so that what they do eat, they get as much nutrition in each mouthful as possible.

## Lactation

Large amounts of nutrients are required for a lactating animal.

Week 1: 50-75% increase on normal amount

Week 2: 100% increase on normal amount (double the amount)

Week 3 & 4 : 200% increase on normal amount (three times the amount)

Remember a dog can not consume this amount of food at once sitting so free choice feeding, or several smaller meals is often needed.

Milk production is influenced by the quantity and quality of dietary protein. If a bitch is being fed a high quality, nutritionally balanced pet food, she will not require additional vitamin or mineral supplementation during her breeding cycle. The use of such supplements is unlikely to be beneficial and, in some cases, may actually do harm.

## Weaning

At weaning time the food amount for the bitch should be tapered back to maintenance levels (of adult formula), otherwise, she will put on extra weight.

