

# **THE BROOD DAM**

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Notes compiled by Dr Gareth Zeiler for FBCSA Seminar 28/07/2008

# **THE BROOD DAM**

## **1. GROWING UP**

Breeders get excited about the purchase of a new brood dam because they own a new blood line, better genetics; perhaps she will become a champ. There is also the aspect of being involved in breeding Boxers to their best potential. A breeding dam is an investment, both for the improvement of the breed and the possible financial gain, so she must be looked after and kept in perfect shape so that she may contribute to her full potential.

### **a. Vaccinations**

As with all dogs, keep them up-to-date with the vaccinations. They should get their first “5in1” at 6 weeks old then a first booster one month later. The second booster is a month after the first, you also should vaccinate for rabies at this date. The second booster vaccination will then become the annual vaccination day. Remember that you need to boost the rabies at least one month after the first rabies vaccination. Rabies must be given by law.

This protocol is not written in stone, your local veterinarian may have another vaccination protocol. All of the protocols have the same outcome, so listen to your veterinarian with regards to this.

The main reason for keeping your brood dam up-to-date with vaccinations is that she produces anti-bodies (a part of the immune system) that will be transferred to the puppies via colostrum; this will be discussed in more detail at a later stage.

### **b. Good puppy food until 18 months**

Your dam will be growing to adult mass over a period of roughly 18 months. Remember that the skeleton and soft tissue (rest of body) grow at different rates. All good puppy foods (for large breed dogs) will have a feeding guideline table at the back. It usually has the desired adult mass at the top (columns) and age in months down the side (rows). The desired weight is around 30 kg, so follow the 30kg column down to the correct age of the dam and feed that amount per day.

If you feed more, she will grow faster, and you may think that this will impress everyone but remember that the skeleton will still take 18 months to mature, so she will reach adult weight too soon and stress the juvenile skeleton. This will create skeletal problems later on in life (Hip Dysplasia, Arthritis etc.). Puppies generally do not pick up fat, they transfer the energy into growing their soft tissue (muscles) first and only once this has grown to its full genetic potential, then they will accumulate extra energy as fat, if you are over feeding this will happen around 10 to 13 months of age.

The dam will grow to her genetically determined size in 18 months, so never rush it. Supplements are almost never necessary so do not even bother, especially if she is on a good food.

### **c. Pre breeding pointers**

There is still a lot of debate amongst the veterinarians on when to breed the dam for the first time. She should first come onto heat at around 7 months of age. She is still a puppy and growing, if she falls pregnant now, her energy will go towards her litter and not to her growth. So it might not be a good idea to breed on the first season. The second season should come around 14 to 17 months of age, although she is still a puppy, she should be able to carry a healthy litter without causing harm to herself. So aim to breed from the second season onwards. Most dams could produce good litters until 6 years of age.

The first season will often be a “silent heat”. In other words you may not notice the characteristic signs of heat and miss it completely. The second heat is often easier to notice, some dams may still have a silent heat though. A few signs will be described in 2b to help you notice silent heats.

## **2. COMING INTO SEASON**

To become a truly successful breeder, you will need to understand the Oestrus cycle of the dam. The more understanding you have of the cycle, the better your timing will be for breeding and the bigger the litter. Each dam will have her set cycle length, some dams in certain breeds will cycle once a year, while other are twice a year. The Boxer seems to be able to do both, some cycle once, while other cycle twice (smaller dams). This makes it harder for the breeder, luckily if she has a once year cycle than she will cycle like that for the rest of her life.

### **a. Brief overview**

The behavior patterns and uterus are all under the influence of hormones produced by the ovaries. The two main hormones involved in the cycle are oestrogen and progesterone. For all practical purposes one can say that oestrogen causes the signs of heat (Oestrus) and progesterone carries the pregnancy.

There are four stages to the oestrous cycle in dams, namely: Proestrus, Oestrus, Dioestrus and Anoestrus. Veterinarians can tell the different stages through observation, speculum examination, vaginal cytology (study of the cells found in the vagina), blood hormone level essays and ultrasound. The breeder can determine the different stages through observation; both physical and behavioral signs may be observed.

The stages of the cycle have variable lengths:

Proestrus	9 Days (0-27 Days)
Oestrus	9 Days (4-24 Days)
Dioestrus	2 Months
Anoestrus	4 Months

This is the reason why breeders should insist on using as many criteria to determine the stage of the cycle. Relying on the number of days after first sign of bleeding (10 days) could mean that the dam is either still in Proestrus or Oestrus, remember though that it might not be the correct stage in Oestrus. You want to have your dam bred in the late stage of Oestrus to get the best chance of having the biggest potential litter. Once a dam has had a cycle, she will keep her cycle length constant.

**b. What to look out for**

This is a table of all the physical and behavior changes you will see in your brood dam:

	Proestrus	Oestrus	Dioestrus	Anoestrus
Behavioral Changes	Dam attracts the male but will not allow mating	Dam will attract the male and will allow mating	Dam will show no interest in the male	Dam will show no interest in the male
Physical Changes	The vulva will be swollen and turgid. With a serosanguineous discharge (bloody discharge)	The vulva will still be enlarged, but much softer. The discharge changes to a straw colour.	The vulva returns to normal size. There may be a discharge. There may be some mammary development towards the middle of Dioestrus	The vulva size is normal, no discharge and no mammary development.

**c. What is happening (hormones)**

This is a diagram of the three most important hormones in the dam’s cycle. Followed by an explanation of what is going on.

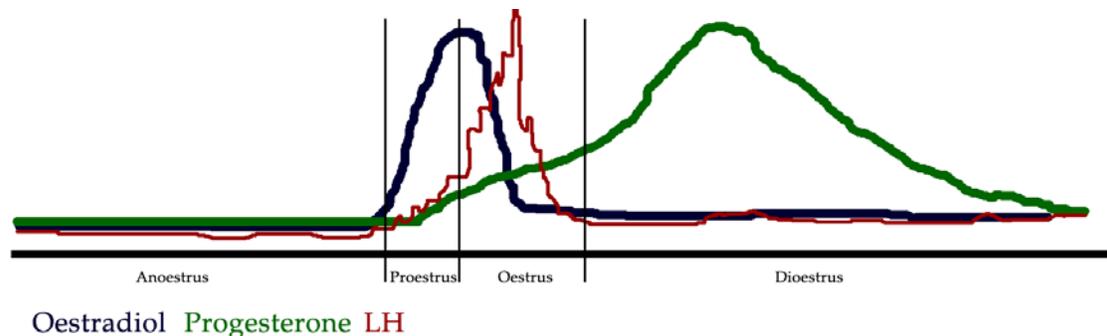


Figure one: The Dam’s Cycle showing hormone levels over time.

The Anoestrus section of the cycle shows that there are basal hormone levels. This means that the body is circulating very small volumes of each hormone. This means that the ovaries are inactive and the uterus is dormant.

External stimuli (day length, season) and internal messengers (Other hormones such as FSH and LH) start to send messages to the ovaries to wake up. This causes the ovaries to produce follicles. The follicles in the ovaries mainly produce the hormone oestrogen. When this starts to happen, the dam will move into Proestrus. Oestrogen has a number of effects on the dam. The first is where it causes the uterus lining to increase in thickness and increase the blood supply to the inner lining. It does this to prepare for a possible implantation of a fetus if the dam is mated. The vulva also swells up with fluid giving it an enlarged and hard feeling; this is often very prominent and obvious to see. The dam's behaviour also changes, she will often accept male dogs into her comfort zone and "play" with them, she may not allow the male to mount her, and she will often stop all "play" when this happens. Proestrus ends when the level of oestrogen starts to decline.

When the levels of oestrogen start to drop, there are a few signs that you will notice. First, the vulva starts to soften and become flabby. The vaginal discharge also changes colour and becomes more straw coloured. The most important change is that the dam will still attract males and now allow them to mount her. This is the stage where some breeders will bring the dam to the male far too early or too late, this stage can be as long as 24 days! This will create small litter sizes or phantom pregnancies. The best time to start mating is in the late stages of Oestrus around the time of the LH surge. This is important to remember, the LH surge causes the follicles in the ovary to "burst" releasing oocytes (eggs), and this takes two days. These eggs are young and still need to divide, this takes another two days. This means that a fertile egg reaches the fallopian tube only 4 days after the follicles have ruptured (burst). Healthy dog sperm will remain active for an average of 7 days, inside the uterus and fallopian tubes, the aim is to get all the oocytes into close proximity of living sperm to start fertilization.

Once the follicles in the ovaries have ruptured, the ovaries form a structure called a corpus luteum. This structure produces the hormone of pregnancy – Progesterone. When this happens, the dam will move into Dioestrus. Dioestrus can have many outcomes, it could mean the dam is: pregnant, not-pregnant with phantom pregnancy or just plain not-pregnant. If you have bred with the dam, then you want her Dioestrus to be pregnant.

Once the outcome of Dioestrus has been determined, two odd months after that the dam will return to Anoestrus and it all starts again.

#### **d. Working with your vet**

As a breeder there are three important stages in the process of mating and pregnancy that you should think about involving your veterinarian. You wish to afford the dam the best opportunity to produce the biggest and healthiest litter that she can. The first and often most important stage is to determine the correct time for breeding. If you get the timing wrong, you will get an under average litter size.

### **The breeding visits:**

When you notice that the dam's vulva starts to swell, it is your cue to start thinking about taking the dam to the vet for oestrus monitoring. Remember that the dam may, at this stage, be in either Proestrus or already in Oestrus. Your vet should at the very least do a good clinical exam, examination of the reproductive organs, reflex examination and a speculum exam. Smears at this stage are not vital, but are a very good idea to take for reference. The speculum exam is a quick and meaningful test to run. The vet should be able to tell you if the dam is in Proestrus or Oestrus.

Every day examination by the vet can get tedious; I recommend every second day examination. With special arrangements with the vet, the consult can be as quick as 15 minutes. Remember, if you get one or two puppies extra out of the litter by breeding at the correct time you will make more money.

When the vet is happy that the dam is in late Oestrus, he will recommend that that dam visits the Stud dog. Usually two matings will be sufficient. It might be a good idea to ask the Stud dog owner to take the dog for a semen evaluation two days or so before the Stud visit. This will prime the male reproductive organs, get rid of old sperm and make sure that his sperm are up to the task. I say this because you are going to invest in veterinary visits and if the dam has a small litter it could be the male dogs fault. The Stud owner may ask you to pay for the examination of their dog; if you get a big litter the costs will be offset. Negotiate with the Stud owner about costs involved.

I encourage you to carry on with the veterinary exams at two day intervals until the vet has determined cytological day one of Dioestrus (D1). This day is very important as it will mean that if the dam becomes pregnant she will be due exactly  $57 \pm 1$  days after this date. This is important for whelping management. It is a far more accurate estimation compared to the usual 64 odd days after mating.

### **40 days post D1 exam:**

This is an optional examination, at this date the veterinarian can most defiantly confirm pregnancy. If the veterinarian has ultrasound they can often tell at a much earlier date. On this exam, it would be a good idea to take radiographs of the abdomen (X-rays). This is the only accurate test to determine how many puppies there are, we do this by counting the number of skulls and spines we see and divide the sum by two. This is nice to know because the breeder will know how many to expect, and makes the whelping process less stressful as you do not need to guess when the dam is finished. This is also a good time to start feeding the dam a good large breed puppy food. To make sure her calcium supply is adequate and that she has enough energy to let her puppies grow strong. Please do not give a calcium supplement; this will predispose her to hypocalcaemia (milk fever).

### **One day after birth:**

It is a good idea to visit the veterinarian the day after the birth, especially if you are an inexperienced breeder. The veterinarian will examine the puppies and rule out any congenital birth defects (cleft palates, hair lips, Artesia ani etc.) and make sure that the dam has a good milk supply and that she has given complete birth.

## **3. PRE PARTUS TIME**

Once pregnancy has been confirmed, it is your task to keep the dam in good shape so that she may carry the healthiest litter possible. Here are a few things you could do besides keeping her active and on a good adult maintenance diet until two weeks before birth.

### **a. Ultrasound**

Ultrasound is a very useful tool to diagnose pregnancy early. It is best used 25 days after mating. This would be the earliest that pregnancy could be scanned accurately. This of course would depend on the ultrasound equipment and the veterinarian's ability to scan.

The ultrasound scan can tell you that the dam is carrying puppies and that the puppies are not stressed. It will never tell you how many are present. No veterinarian is able to accurately determine the litter size on ultrasound, they may try guess but that is all it is, guess work.

### **b. Radiographs**

Three weeks before birth, around D40 after D1, the puppies will start to place calcium on the skeletal system. We can see this on radiographs. This is a good idea to do as the veterinarian will be able to determine the size of the litter accurately, this will eliminate guess work during whelping. In rare cases it could also indicate fetal death; I hope this does not happen to your dam.

### **c. Deworming**

Remember to deworm the dam at least 5 days before birth. Most dewormers are safe for pregnant dams. If you are worried, ask the veterinarian to dispense the safe dewormers. Remember that some of the worms can infect the puppies via the placenta, so they will have worms before they are born. The worms can also be transferred via the milk from the dam. Worm infections in puppies is very common and is one of the big puppy killers, especially hook worm.

## **4. PARTUS**

This is a fun and scary time during the pregnancy, most of the time there will be no problems. Here are some pointers to remember around this stage of pregnancy. Remember that if you know the D1 you can be very certain when the dam is due.

### **a. The normal birth**

24hrs before birth the dam's rectal temperature will drop by 1 degree Celsius. This is very constant. If you have not determined D1 and are using the 64 days after mating guess at the date of partus I would recommend taking the dam's temperature twice daily from day 58 onwards. It is fast and easy to do; all you need is a thermometer and sheet of paper to record the date and temperature. Digital thermometers are easier to use and cost effective, any pharmacy should have one.

If you miss this, then you may notice that the dam will start to miss meals, have nesting behaviour and start panting. If you look at her abdomen you should notice contractions. They will be very subtle in the beginning, increasing in frequency until birth. The contractions help push the puppies into the birth canal. Once a puppy has entered the birth canal it will send reflexes to the brain to stimulate more frequent contractions.

If this is the dam's first litter, once you start noticing contractions with straining the first puppy must be born within 4 hours after straining. So if you see nothing after two hours, you should start preparing for a visit to the veterinarian. If it is the dam's second or greater litter, we usually wait for no longer than two hours.

After the first puppy is born, the others usually follow half an hour after each other. If you are present during the birth you should record the times on paper when the puppies are born, do not rely on your memory. If it is taking longer than half an hour between puppies the dam may not have enough calcium and energy to deliver properly. It would be a good idea to phone the veterinarian for advice.

### **b. Difficult Births**

Dystocia is when there is trouble with the birth process. The dam may not start whelping at the correct date that you thought. If you have not determined D1 or taken rectal temperatures then there is a lot of guessing. One thing that the veterinarian should do is at least conduct a speculum examination and look for the cervix and determine if it is dilating. If there is an ultrasound machine, it would be a good idea to scan the puppies and determine their heart rates. Decisions can be made after these assessments to either wait longer for normal birth or send the dam for surgery.

Sometimes the dam will strain for longer than normal, when this happens you must visit the veterinarian as the puppy may be coming out the wrong way, or stuck. If you leave it for too long you could lose the puppy, cause swelling of the birth canal making it difficult for the other puppies to come out, and in rare sad cases loose the dam.

Other times the dam will show weak contractions for a very long time (longer than four hours) with no birth or straining. Or the first few puppies will come out fine, than the dam's contractions get weaker. If this happens, than the dam has run out of energy and calcium and needs veterinary attention.

**c. When the vet should be called**

- 2 hours after contractions and straining have begun without any birth.
- More then half an hour has gone by between puppies, very helpful if you know how many puppies to expect.
- No contractions around the date of expected partus.
- Placenta is delivered without a puppy; you will see black/green discharge with a sac and no puppy.
- Whenever you feel things are not going as expected.

**d. Elective c-sections**

This is a common request now-a-days, if you know the D1 than the surgery can be diarized for 57 days later. If you are counting the days after mating, then bring the dam for an examination around day 63, if the cervix can be seen and there is marginal dilation, the surgery will be safe enough to do. If the veterinarian has ultrasound, they can also determine fetal stress indicating that birth is imminent.

## **5. POST PARTUS WEEK 1**

The most important time, you should have the puppies examined by the veterinarian to make sure there are no birth defects and that they are strong. Remember to rub the puppies (when they have just been delivered) well with a towel, this stimulates them to breath and cry, this will open the airways.

**a. First 24 hrs**

This is the time when the puppies need colostrum. Colostrum is a special type of milk that has lots of anti-bodies (as part of the immune system). These anti-bodies are derived from that dam; this is why she needs to be up-to-date with her vaccinations. The puppies gut lining is very "porous" designed to absorb large protein anti-bodies. The gut stays like this for 24 hours then starts to close. This is why the puppies need as much colostrum within the first 24 hours as possible; this will insure a healthy start to life. Puppies that do not suckle need to be stimulated to suckle, or you will need to milk the dam and bottle feed these puppies with colostrum. If you do not insure that all the puppies get as much colostrum as possible you will have sick puppies.

### **b. First week**

This is the hardest time for some dams, especially if they are first timers and have a big litter. You must make sure that the dam eats well and does not forget to take care of herself. You must also watch that she cleans the puppies regularly. Some dams have the problem of lying on their puppies, this could cause accidental deaths.

### **c. Hypothermia**

If you have a winter litter than you may be faced with this problem. Hypothermia in puppies is very common in the first week. This is because puppies at this age do not have functioning “thermal control” abilities. So they struggle to keep their core body temperature within the normal range. They rely on their dam to keep them warm. If the litter is being kept outside, you must provide other sources of heat such as newspaper, blankets, chicken lamps, oil heaters that are shielded so that the puppies cannot get close to it. A whelping box is also a good idea, as it will be easier for the dam to make a warm nest.

Puppies that are suffering from hypothermia will be quiet, appear weak, and not be interested in suckling. They will use all their energy to try produce heat to keep their body temperature within normal range; this will cause hypoglycemia and eventual death if you fail to notice these signs.

A hungry puppy will cry and complain a lot, they will usually still be strong and feel warm. A hypothermic puppy will be quiet, weak with a poor uncoordinated suckling reflex and will also have a cool skin temperature. A healthy puppy will feel warm and be quiet when full. You will need to check up on the litter regularly to make sure the puppies are being looked after.

## **6. POST PARTUS WEEK 2 – WEEK 4**

### **a. Deworming**

Deworm often; remember all puppies have worms until proven otherwise. You must deworm them every two weeks with a dewormer from the veterinarian. Over-the-counter dewormers at grocery stores do not always protect against all the families of worms.

The hook worm is perhaps the biggest puppy killer; you must make every effort to prevent this worm from causing damage to your litter.

The basics also apply with worm control, pick up the droppings daily, and do not hose them away. If you hose the droppings away or into the grass all you are doing is breaking up the dropping into small amounts and releasing all the worm eggs, what is even worse

is that you provide a moist environment for them to survive. To prevent this use a plastic bag and pick it up.

### **b. Milk and weaning**

Generally the dam will allow the puppies to suckle up until four weeks. The first time dam may even increase the suckling period. It is a good idea to start introducing solid foods at around 4 weeks. Use a good large breed puppy food kibble. Use a few bowls, it is best to try getting every puppy their own bowl so that you can monitor their intake. Place a small amount of kibble into each bowl, add hot water and let it soak until it is room temperature. Then mush the kibble up and feed it to the puppies. Puppies may not start on dry kibble very easily as it hurts their gums, they will usually eat well for the first two servings and then give up. You should feed at least three times a day, but four would be better. They will start to lose interest in the mothers milk once they know they will get regular feeding. Try to keep the feeding times consistent. In some cases the puppies will have a bit of diarrhea and vomiting, this could be normal, if you are unsure rather call the veterinarian. You can start adding small amounts of dry kibble to the mush at around six weeks.

## **7. POST PARTUS WEEK 4 – 8**

### **a. Deworming**

Remember to keep up with the deworming schedule, one dose every two weeks.

### **b. Vaccinations**

The first vaccination is given between 6 and 8 weeks. It would be a good idea to have them vaccinated at least a week before they are leaving their litter mates. I say this because the vaccine causes stress on the body and immune system, when the puppy leaves the litter it causes social stress, they often get a new diet which will cause dietary stress. Very often this is too much for the puppy and they fall sick.

The puppy will have the mother's anti-bodies still circulating; their level has already started to drop by this time. The first vaccine is often attacked by the mother's anti-bodies circulating in the puppy. This means that the puppy does not have a chance to really build their own anti-bodies against the antigen (foreign viral proteins). This is why we need to boost the first vaccine with at least two more vaccinations.

### **c. Socialization**

From 4 weeks on, the puppies show a lot of independence, they will learn to get along with litter mates and the dam. This is the beginning of imprinting, where the puppies learn to fit into their surroundings and interact with people and other dogs. You must allow them to learn as much as they can. They will start learning discipline from 6 weeks onwards, where the dam will roll and mock bite them; you must not stop this because the

puppy needs to learn its place in the social hierarchy. You should also hold and spend as much time with them so that they can get used to human contact.

## **8. Conclusion**

Breeding dogs can be a lot of fun and a rewarding experience. It is easy to get things right all the time if you stick to a few good guidelines. It is also a long commitment that will take a lot of your time, so be sure that you are up to the time constraints, especially the first four weeks of the puppies' lives.

*References available on request, save a page save a tree.*