

**Reproduction Problems in the Bitch
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2007**

Problems in Reproduction

Reproductive problems in the bitch as measured by :

- poor fertility,
- small litter size,
- failure to hold pregnancy etc,

Poor fertility can be as a result of a wide variety of factors. These can range from :

- genetic,
- environmental,
- hormonal,
- dietary
- timing of mating
- histories of the parents of the proposed litter.

To discuss all these areas in depth would probably fill a small book, so the major areas are discussed in outline.

Solving Reproductive Problems

- Unfortunately, not all infertility problems can be solved. This is a constantly expanding research field and our control over canine infertility improves as breakthroughs occur.
- Too little is known even now, about infertility in the bitch and specific hormone levels within different breeds.
- Because of this, one should be reluctant to use hormone therapy on bitches unless they have a well proven history of poor fertility or specific hormonal problems affecting the pregnancy itself.

The more facts available to the veterinarian, the more likely a satisfactory result will be achieved.

The Importance of Good Records

It is most important to remember that every bitch is different and so is every case of infertility, poor fertility or reduced viability of puppies.

If there is a good history with presenting bitches, the veterinarian can make a far more informed diagnosis as to where or what the problem is.

The main points to be able to tell your veterinarian about your bitch are as follows :

- 1. Her age and general health condition
- 2. How often does she cycle and the length of season.
- 3. When she is normally mated during a season and over what period.
- 4. Does she mate easily or does she require artificial insemination.
- 5. Does she have purulent discharges during or after seasons.
- 6. Does she have false pregnancies.
- 7. Does she have live puppies and how long do they survive.
- 8. Diets and breeding history of the whole kennel.

Specific Problem Areas

Timing of Mating :

- incorrect timing of mating the bitch is **the most common reason** for low fertility or failure to get pregnant.
- standard season in the bitch lasts 3 weeks with the average bitch being mated between day 10-14.
- a reliable stud dog in the back yard, can be a good indicator of when the bitch is approaching the optimum time for mating,
- the majority of breeders have to rely on either smear testing or more recently on progesterone blood testing.

Smears

Examination :

- when the cells are all cornified (flattened out and the nucleus is barely visible), the bitch is ready to mate

Accuracy :

- reasonably good if doing serial smears during the season,
- poor to acceptable if doing the odd smear during the season.

Progesterone Blood Tests

Blood tests to determine the progesterone levels in the bitch. There are 2 types of tests :

- **1. Elisa tests** – take approximately 20 minutes - single test gives a bracket result
 - difficult to know how long the bitch has been in that bracket range or when likely to move out to the next level.
 - **Accuracy increases if doing a series of tests to accurately pick the changes between the different ranges.**
- **2. Assay tests** – generally take 2-3 hours
 - high degree of accuracy with exact results of the level.
 - **Progesterone assays (using a radio-active labeling test) will give extremely accurate readings.**

Progesterone assays are a must with bitches being inseminated with frozen semen, and are particularly useful for bitches traveling interstate and for those with a history of poor fertility.

Progesterone Levels

As a rough guide, the following progesterone levels equate to :

- LH surge (stimulus for ovulation) 1.5-2.0 ng/ml (4.5-6 nmol/L)
- Ovulation (2 days after LH) 5.0-5.5 ng/ml (15-18 nmol/L)
- Fertile period 10-30 ng/ml (30-90 nmol/L)

Ideal mating time around 15-24ng (48-75 nmol)

Progesterone Charts

Time between events (on average) :

- LH to ovulation 2 days;
- Ovulation to fertilization 2-3 days

In the dog, the follicles (eggs) ovulated undergo a final maturation before they are fertilizable [this requires 48-72 hours].

Whelping dates – 63 days from ovulation.

Fixing the Timing of Mating

- When timing of mating is considered as a problem, then the bitch should be monitored through her next season to see whether she actually does ovulate and also when.
- Many of these so called infertile bitches are often at either end of the scale, being either ready very early or more commonly, very late in the season.
- Bitches that have small litters either very “early” or “late” relative to their mating dates are again often merely being mated slightly too early or late relative to their peak fertility time.
- Better timing by mating either a few days earlier or later, can often be all that is needed.

Number of Matings

- Number of matings - two matings, 48 hours apart, are quite sufficient for the average bitch. Semen will generally last very well for 48 hours within the bitch. If the bitch is spot on via the progesterone assay test, one mating is usually quite sufficient.
- For normal matings (without tests etc), once the bitch is standing (and the dog is very keen), generally I wait 24 hours and then first mate the bitch. A repeat mating 48 hours later gives the breeder, a very good chance of covering the entire ovulation period.
- If the bitch is mated over a longer period of time, it becomes difficult to determine when the puppies should arrive; **limited matings** give a more exact range of whelping dates.

Physical Obstructions to Mating.

- Infertility can be as a result of a **physical obstruction/restriction** – preventing the dog from achieving a proper mating. If the stud dog has trouble either entering the vulva or being able to get a "tie" and the bitch objects strenuously, the bitch should be taken to your vet and examined internally in case there is an obstruction. Occasionally the bitch may have a persistent hymen and/or a phrenulum of tissue dividing the vestibule.
- If the bitch has an obstruction or is very small in the vulva, an artificial insemination (AI) can be carried out. Obstructions should be removed if at all possible. If the obstruction is small, it can tear by itself while the bitch is whelping. Unfortunately, most obstructions are not noticed until the time of mating and many owners do not want their bitch anaesthetised unless the obstruction is fairly major.
- Removing the obstruction can make the bitch rather sore for a normal mating in that season. This means that the bitch often has to have to have an AI that season if corrected. These type of obstructions/restrictions are best corrected while the bitch is in fully season as the vaginal area is softened and enlarged, particularly when compared to bitches out of season.

Points to Remember when Mating your Bitch

- If you are **travelling** any great distance to the stud dog, eg. interstate, have the bitch blood tested for progesterone levels prior to traveling. The stress of traveling and changing surroundings **can delay events** by several days, particularly with nervous bitches.
- **Nervous and/or neurotic** bitches often fail to conceive when left somewhere strange to be mated. This means that they are not good candidates to be sent away to stud dogs, particularly for the first litter.

Infections and/or Discharges of the Uterus

- **Infections of the uterus** are not uncommon in the bitch. During a season the cervix is relaxed, permitting a greater flow of bacteria both in and out of the uterus.
- The infections are generally mild and can be quite easily cleared up with a course of antibiotics. Many veterinarians consider these to be insignificant and are dubious as to the value of swabbing in the first place.
- However, discoloured discharges can be an indication of infections and/or low grade metritis (inflammation of the uterus) and should be investigated.
- Bitches over four years of age are far more likely to have low grade inflammatory changes or infections than younger bitches.

Swabbing Bitches

- If there is a history of previous infections of the uterus and/or you are using an expensive stud dog, I would suggest the bitch be swabbed, usually day 3-4 of a season.
- Approximately 80% of bitches will turn up bacterial growths of some kind, which in most cases would probably have caused no problems.
- The most common infections of the uterus are coliform and B.Haemolytic Streptococci, however, there are many types of bacteria. Some are far more resistant to antibiotics than the average, e.g. Pseudomonas, which is extremely resistant to antibiotics.
- Bitches with Pseudomonas infections should not be bred from in that season as this bacteria is very resistant and very hard to remove. Pseudomonas infections are accompanied by a persistent dark brown-green discharge. An affected bitch may need several courses of antibiotics and several swabs before the problem clears up. I also suggest that she is re swabbed to make sure she is clear before being bred from at the next season. Pseudomonas can be almost impossible to get rid of and bitches have had to be desexed because of it.

Discharges during Pregnancy

- During pregnancy, a bitch will **normally** have a small amount of discharge which is clear to cream. There should never be any brown or greenish discharge. If there is ever any discharge of this nature, your bitch should be checked over immediately by your veterinarian. Generally, the vet will put your bitch on antibiotics and/or swab her.
- If a bitch had an infection prior to mating, but was treated with antibiotics successfully, there is no need to repeat the antibiotic treatment unless there is a nasty discharge during pregnancy or the bitch has a previous history of problems. **On the whole, if the bitch is going along well and is healthy, leave her alone and do not fill her with antibiotics unnecessarily.**
- Where discharges persist, the chance of abortion or metritis increases. There may be hormonal reasons for the discharges e.g. failure to hold pregnancy.

Metritis

- Mild cases of infection of the uterus are called metritis.
- **Metritis can be in the form of a low grade and chronic infection of the uterus, causing infertility, irregular seasons, poor fertility or early abortions.**
- Metritis can be the first sign of the uterus failing to cope (often as a result of irregular hormone levels coming from the ovaries) and may go on to develop into pyometra at a later date. This condition needs antibiotics for the infection and drugs such as prostaglandins to assist with drainage.
- If the bitch is old and you have finished breeding from her, desexing will cure the problem, as metritis often develops into pyometra in subsequent seasons.

Pyometra

This is a very serious condition and can cause a critical emergency. Pyometra is a severe bacterial inflammation of the uterus, which can develop rapidly into a very toxic condition. Toxaemia occurs through the absorption of toxins from increasing amounts of pus being produced by the bacterial infection.

Age Group - It is usually seen in the older bitch, who is over 5-6 years of age and is within 2-4 weeks of having had a season. It can occur in younger bitches but is less common.

Causes of pyometra are varied. Older bitches often have poor hormonal control over their seasons and their cervixes may no longer function properly. The cervix may be open during, and do not close off tightly after, a season. This means that bacteria can more readily establish infections than in a fitter, healthier bitch.

Symptoms of Pyometra

Symptoms of pyometra are easy to recognise :

1. The bitch will have had a season which has finished usually within the last 2-4 weeks.
2. Generally off their food, drinking excessive amounts of water, vomiting and are very depressed.
3. There may be a discoloured discharge, depending on whether the cervix is opened or closed.
4. Some bitches present to the veterinarian as having had a prolonged season with bleeding for up to 4-6 weeks.
5. The blood picture (count) is also very characteristic. There is a very high white cell count in response to the severity of the infection and immediate treatment is necessary.

Closed versus Open Pyometra

Open pyometra occurs where the purulent material from within the uterus is able to discharge through the cervix and so relieve both the pressure and the toxic build up. These bitches have a thick discoloured discharge, which is often rather foul smelling.

Closed pyometra is a very dangerous condition for the bitch as the cervix is closed, causing an increasing build up of purulent toxic material, which if not corrected fairly quickly, can cause death. These bitches have little or no discharge. Closed pyometras are often presented as medical emergencies.

Ultrasounds of the bitches abdomen can often assist in determining how severe the condition is, ie. how much pus and discharge is present in the horns of the uterus. Where this is extensive, immediate desexing is advised.

Treatment for Pyometra

Antibiotics and drugs to relax the cervix and to promote better drainage are used immediately upon diagnosis.

Surgery is often necessary on the '**closed**' cases in order to save the life of the bitch, as the toxic effect from the bacterial build up within the uterus can kill the bitch within 2-3 days.

- '**Open**' cases can quite often be treated with drugs to assist in expelling the infected material from the uterus. However, despite this, bitches often have to be desexed within a short time if the condition does not clear up completely.
Once pyometra has occurred, the likelihood of it recurring is very high. Younger bitches have a far greater chance of recovering and can often be bred from in the subsequent season.
- Prostaglandins offer hope for non-surgical intervention, particularly in the younger bitches, but the above conditions in the older bitch still apply, and desexing is often the preferred option once initial symptoms are under control. Milder drugs that may assist in the drainage of the uterus include Millophyline™ and Buscopan™, both of which act as smooth muscle relaxants.

Outcomes of Pyometra/Metritis

- Bitches with metritis and those that have had pyometra should as a precaution be placed on high doses of lactobacillus acidophilus or other bacterial stabilising compounds (eg. Protexin) as these compounds have the added advantage of assisting the bacterial flora of the uterus to stabilise. Ideally such bitches stay on these products continuously until they are retired ie. desexed.
- Bitches post metritis/pyometra treatment should be breed from the **next** season to try to stabilize the hormones and the uterus. Once functioning well, one can afford to miss a season.
- Any return to infection of the uterus usually results in the bitch needing desexing, particularly if she is an older bitch.

Ovarian and Other Hormonal Imbalances

Hormonal imbalances cover probably the second largest group of problems related to infertility. These imbalances fall into two major categories:-

- (i) Major hormones – thyroid, adrenal and pituitary.
- (ii) Ovarian based – cysts or inactivity activity of the ovaries.

Infertility due to Systemic Hormonal Imbalances

Thyroid and adrenal imbalances can cause secondary infertility varying from infrequent seasons to prolonged seasons.

The end result of these types of disturbances is infertility or inability to hold a pregnancy.

These types of infertility are often accompanied by other symptoms such as lethargy, weight gain or loss, lack of coat changes or excessive loss of coat.

Thyroid Hypothyroidism

Where insufficient thyroid hormone is produced, this is the most common endocrine hormone problem in the dog.

In the bitch, reproductive abnormalities associated with hypothyroidism include:

- **infertility**
- **prolonged time length between cycles,**
- **failure to cycle,**
- **prolonged oestrous bleeding,**
- **decreases in the intensity and duration of the oestrus cycles.**

In the male, reproduction abnormalities include:

- **lack of libido,**
- **testicular atrophy**
- **hypospermatogenesis (reduced sperm production).**

Treating Hypothyroidism

- T4 blood tests available to determine the thyroid levels.
- Once diagnosed, there are tablets that can reverse most of these effects.
- If however the condition is difficult to stabilise, then the chances of a bitch carrying to term are not good, nor of returning a male dog back to normal fertility.

Other Hormonal Problems

- **Adrenal Infertility:** Can occur due to adrenal hyperfunction known as Cushings Syndrome. A persistent anoestrus (failure to cycle) occurs in over 75% of cases. Treating dogs with Cushings Syndrome is fairly difficult and delicate work. Unless the adrenals are well stabilised, the likelihood of a bitch having a normal season and then carrying to term, is negligible.
- **Pituitary:** The pituitary gland is another of the body's major regulators. Any upset of the pituitary gland will have a feedback effect on the ovaries and testicles.

Factors also affecting Hormone Levels and thus Fertility

- **Change of Hemisphere** - this can cause infertility, especially in older bitches that are sent from the northern to the southern hemisphere.
It may take up to two years for the hormones to get used to the rearrangement of the seasons and the temperature changes.
Younger bitches tend to acclimatise much more rapidly, usually within 6-9 months. It can take an adult dog or bitch up to two years for the coat to settle down properly after this drastic of change of environment.
- **Severe Weather/Seasonal Changes** - this problem is of a temporary nature. What may occur, especially around the turn of the seasons, is that heavy and prolonged rain and overcast weather, or lengthy hot, dry spells, may extend the season and delay the normal timing of that season.
All these things can upset a normally very regular bitch and may, at the same time, affect the fertility. This type of problem is usually temporary and corrected by time and the weather. It is usual for many bitches to be affected at the same time. Maiden bitches on their first season are often the most affected by this. They start and stop, and then finally get going into a normal season.

Ovarian Based Factors – Cysts or Inactivity/Activity of the Ovaries

Causes of inactive or poorly developed ovaries can include:- chromosomal abnormalities, anabolic steroid and/or hormone injections, obesity and reduced weight caused by either hyperactivity or too low a protein diet.

If the bitch is **Obese** and has been so since she was young, the ovaries can be poorly developed. Many of these bitches will have poor fertilities on their first litter. Most animals so affected will gradually return to normal fertility if the weight is kept down near to the ideal, however, it may result in permanent infertility and/or low fertility (particularly within some breeds). The excessive weight goes into rapid growth at the expense of gonadal (ovarian or testicular) maturity.

Hyperactive bitches, or those that are in very hard working condition, often have poor fertility and irregular seasons.

Obviously bitches that are grossly over or underweight should be placed on a suitable diet to return the weight to a normal level. The fertility of these bitches, if they do conceive, is generally low, with litters of only one or two puppies instead of the normal sized litters.

Ovarian Imbalances

- **Failure to hold pregnancy**

This type of problem is usually seen where the bitch may have conceived but either aborts at around 5-6 weeks or has mummified puppies at term.

Mummified puppies are dried out and look shrivelled. They appear as a greenish mess but do not smell or cause problems to adjacent puppies in the uterus.

This is due to insufficient hormone levels to hold the pregnancy, possibly secondary to ovarian cysts. These problems tend to be recurring ones and injections of progesterone, usually from 3-7 weeks, are needed to hold the pregnancy safely.

- **Failure of signal to whelp.**

This may occur when the bitch fails to go into labour at the right time, going over time by 4-5 days.

When and if the bitch finally goes into labour the puppies' membranes have been breaking down, possibly for several days, and there may be dead puppies or very thin, weak puppies that fail to suck. Not all bitches that go over time have this problem.

More commonly seen where there is only 1 puppy in the litter.

Cystic Ovaries

- A large number of older bitches may suffer from cystic ovaries. Cysts on the ovaries produce hormones which in turn can upset the normal hormone levels and cycles. Ovarian cysts can produce excessive amounts of either oestrogen, progesterone, or no hormones at all.
- Irregular season lengths can occur as the result of productive cysts on the ovaries. The seasons may be as close together as 2-3 months apart, or very infrequent e.g. every 12-18 months. There can also be seasons of abnormal length, sometimes lasting 5-6 weeks. The bitch may also be in season for one week, then out for a short time, and then back on again for several weeks (split seasons).
- Ovarian cysts can produce endometrial hypoplasia and are often one of the predisposing causes of metritis. Older bitches with pyometra are often found to have large numbers of cysts on both ovaries when they are operated on to be desexed.

False Pregnancy

- This can occur without any obvious cysts on the ovaries. The reason for this can be persistent 'corpora lutea', where cells lining the cavities of the ruptured follicles produce high levels of progesterone, which cause the body to think it is pregnant.
- This is a common occurrence in the bitch. Occasionally, the follicles developed during a season do not all rupture, again causing a similar picture.
- The false pregnancy usually lasts 5-6 weeks, with some thickening of the abdomen, swelling of the milk glands and behavioural changes similar to pregnant bitches. Rarely, a bitch may even go so far as to nest, go into labour and possibly pass a small amount of clear fluid.
- Can affect maiden bitches on their first seasons (particularly in certain breeds, eg. Dobermanns), and most will go on to have normal seasons and normal fertilities. Signs will disappear without treatment and it can be harmful to future seasons to treat these with hormones unless there are very good reasons for interfering.

Aborting the Bitch

Use of Mismating Injections :

Careful thought is needed –pyometra/metritis and subsequent infertility are common results. This is to highlight the problems associated with the old mismating injections. The problems are very serious and should be considered thoroughly before deciding to use this method to abort a litter.

“Old” Mismating Injections (OESTRADIOL) :

This drug must be treated within 48 hours for the injection to be effective. The risk to the average bitch is quite high and the possibility of permanent damage is very real. Initially one injection was used, nowadays, the trend appears to be three injections given on consecutive days.

If oestradiol hormone injection used, tends to revert the season i.e. the season will last for another 10-14 days and the bitch is quite able to get mismated again during this time. The sudden alteration of the hormones causes changes in the uterine pH, which means that the bacterial population of the uterus is affected and this can set off infections. If used, the bitch should be placed on antibiotics at the time of the mismating injection in case infections do develop.

The bitch is usually not fertile on that particular season and cannot afford to get mismated again and have a second injection (or course of injections) - as the chance of the bitch developing pyometra becomes extremely high.

Subsequent to this drug use, the number of bitches that develop ongoing metritis, infertilities and infections is quite high. Certain breeds appear to be particularly sensitive to these injections especially Rottweilers and German Shepherds. Few Rottweiler bitches reproductive tracts ever recover sufficiently to hold a pregnancy.

Use of Prostaglandins :

- Until fairly recently the safest way to abort a bitch has been by the use of prostaglandins (Lutylase*) injections. Lutylase* may be safely given to pregnant mismated bitches from day 32-34 of the pregnancy.
- This will abort the bitch in a natural fashion and not adversely affect future fertility. Injections are usually given morning and night for five to nine days and they effects last for approximately 1 hour. Walking the bitch for 5-10 minutes can reduce the side effects. Side effects include some vomiting and salivation. This drug is also used in cases of uterine infections such as pyometra, as it evacuates the uterus.

The draw back of these injections is that they cannot be used effectively prior to **day 32** after mating as the uterus will not respond until this time. Additionally the bitch needs multiple injections before the aborting occurs and they can be rather uncomfortable during the hour while the injection is active with uterine cramping.

Use of Anti-progesterone Drugs

eg. Alizin* to Prevent Pregnancy or Abort the Bitch

- Fairly recently, has been the development of drugs that block progesterone receptors, preventing implantation and or causing abortion safely and quickly. Two injections of Alizin* are needed 24 hours apart and can be given from 0-45 days after mating.
- The injections are reasonably expensive and one would ideally not give them at least until the season had finished – just on the off chance the bitch was to get re-mated again! As stated, many mismatings are not fertile as they are often too early or too late, my advice is to wait until you know the bitch is definitely pregnant (usually can be sure by day 24-28 post mating – definitely by ultrasound at that stage).
- This class of drug is very safe as it is so highly specific in its actions and also has few if any side effects that will interfere with future fertility.

This drug is the preferred method for the prevention of pregnancy or any or early abortion.

Avoid Mismating Injections

- *** Waiting to see if the bitch is actually pregnant before applying drugs is far preferable to the use of mismating injections.
- Many mismatings occur either very early or late in a season, often when the bitch is infertile and usually to dog well known by the bitch.
- Over ½ the mismatings do not conceive, those people who are very concerned can do a progesterone assay on their bitch which will give a quick result as to her likelihood of conception.

Chemical Means of Stopping a Season in Bitches

- There are several ways of chemically stopping a bitch from coming into season, or accelerating the bitch through the season. Before you use any of these drugs, you should **very clearly think what you want to do reproductively with the bitch in the future.**

While most of these drugs are good, there are some side effects, effects that can severely risk the bitch's future fertility. Some breeds in particular are extremely sensitive (in the adverse sense) to hormonal treatments and breeds such as the Rottweiler, German Shepherd and the Collie would all rank as highly sensitive.

- Generally speaking I strongly advise against the use of hormones to either postpone, suppress or interfere with a season on **ANY bitch that you wish to breed in the future**, especially if it is of irreplaceable bloodlines. Additionally, these drugs if they have to be used, ideally should never be used before or during the first season – a complete normal run through of the normal hormones is to be highly desired in the first season.

- **Covinan** – if using hormones to interfere with normal cycling, one of the better ways to postpone or prevent a season is to use an injection called Covinan* - this is a progesterone based drug with low risk of adverse effects on the lining of the uterus. This injection can be used for short and long term suppression of heat cycles. Long term suppression requires injections every 5-6 months. Generally this injection is best given when the bitch is not in season.
- **“Ovarid”** (the pill) is currently, a less frequently used treatment. This can be used for heat suppression and postponement. This is given to the bitch from the first day of season and continues for eight days. Lock the bitch up for 5-6 days as mismatings can still occur. The drawbacks of the pill are that it must be started on the first few days of the season as it will not be as effective if used later in the season. The length of time that a bitch will stay out of season is highly variable - it can be as short as three months and as long as 9-12 months. If it is a bitch that you may wish to breed from at a later date, the possibility of developing cystic ovaries and/or chronic long grade metritis as a side effect is not uncommon.
- **Long-term use of these suppression hormones** on non-breeding bitches has its own set of drawbacks including the expense particularly in the larger bitches. Undesirable side effects can develop where bitches may stay out of season for as long as two years, hormonal imbalances due to cystic or inactive ovaries, and the possibility of metritis or pyometra.
- **Personally, I think all bitches should eventually get desexed, particularly older bitches as soon as their reproductive career is finished.** Older bitches, whether or not they have ever had a litter, are highly prone to develop mammary tumours and pyometra (severe uterine infection), from the age of 5-6 years onwards. Desexing removes the hormones that cause these conditions. A desexed bitch is very low maintenance.