Dogs Victoria Fact Sheet
Breeders and Breeding

Normal Reproductive Anatomy & Physiology

Part of being a knowledgeable breeder involves learning about and understanding both the anatomy and the physiology of the canine reproductive system.

You will need to have a basic idea of normal anatomy and function so that you will know what to look for and expect when it comes time to breed your bitch. You will also want to learn all the correct terminology so that you can talk to other breeders, your veterinarian and the owner of the stud dog in a meaningful way.

Being aware of the timing of events and the subtle changes that may indicate your bitch may be coming into season means you should have every opportunity to have a successful mating. It will also mean that you will notice when things are not right, allowing you to seek advice early.

Normal reproductive anatomy of the female

When puppies are born, they already have all of their reproductive organs; they are just not developed. As the puppy grows and approaches puberty, the various organs begin to produce the hormones that control reproduction. The organs mature, and the animal becomes ready to reproduce.

The reproductive tract in the female consists of:

- A pair of ovaries
- The oviducts - which join the ovaries to the uterus
- The uterus (or 'womb') - which is separated into two long 'horns' that join together to form the uterine 'body' near the cervix
- The Cervix – which acts as the barrier between the vagina and the uterus
- The Vagina
- The Vulva – the externally visible opening of the vagina

The Mammary glands also form part of the reproductive system.

Externally, you can only see the teats and the vulva, and these may be well covered with hair in some breeds.

Normal physiology of the female reproductive cycle

Female canids only ovulate once each cycle (called 'mono oestrus'). Their reproductive cycle continues from puberty to death – they do not undergo any form of menopause. Generally, maximum fertility occurs around the 2nd, 3rd and 4th seasons (around three years of age).

The normal female cycle

The female reproductive cycle in the dog consists of four different stages:

Pro-oestrus – the 'getting ready' part of the cycle.

During this phase, you will notice changes in your bitch's behaviour, swelling of her vulva and the onset of a bloody discharge. She will become attractive to male dogs and may be quite 'flirty' with them, but she will not allow them to mate her. Pro-oestrus usually lasts about nine days (can be anywhere from 3 to 21 days).

Oestrus – this is the part of the season where the bitch is sexually receptive and when ovulation occurs.

The discharge seen becomes less profuse and more of a straw colour, and the vulva becomes larger and softer. Oestrus is often defined as extending from the first day that the bitch will stand and allow a male dog to mount her through to the day she no longer accepts the male. The length of the oestrus part of the cycle is usually around nine days (can be anywhere from 3 to 17 days).

Note:

Together the 'pro-oestrus' and 'oestrus' stages are usually referred to as a 'season'.

The average season lasts around 2 to 3 weeks (although it can be anywhere from a few days to a month), after which the bitch will enter di-oestrus and anoestrus.

Normal Reproductive Anatomy & Physiology

Di-oestrus/Meta-oestrus – This period last for around 60 days after the end of the oestrus period.

There can be two different outcomes in the female dog – the first is where she has been mated and becomes pregnant, the other is where she was not mated, or the mating was unsuccessful. If she is not pregnant, she will enter a pseudo-pregnant state as the hormonal changes are basically the same whether the bitch is pregnant or not.

Anoestrus – The anoestrus phase is the 'resting' phase between seasons and is accompanied by an extended period of ovarian inactivity.

When can I expect my feamle to have her first season?

Most young bitches will have their first oestrus (season) around the age of 8 to 10 months of age. Of course, this varies with the size of the dog – with smaller and toy breeds reaching puberty earlier (around 6 to 8 months of age) and giant breeds taking much longer (anywhere up to 2 years of age).

It is not uncommon for a bitch's first season to be irregular with 'silent seasons' (no external evidence of a season) and 'split seasons' (where the bitch will bleed for a few days then stop, then around six weeks later bleed again) both quite common. The swelling of the vulva may also be far less dramatic than that seen in older bitches when they cycle.

Important!

If you are new to breeding and do not know what you should be looking for, ask your vet, mentor, or experienced breeder to show you.

Although it is possible for a bitch to fall pregnant and whelp a litter at her first season, her reproductive tract may not yet be fully developed, and there may not have been time to fully assess her disease and health status. For this reason, there are rules relating to 'adequate maturity' to encourage responsible breeding.

There is a breed listing in the Dogs Victoria Regulations with accepted minimum breeding ages declared for many breeds, which you should be familiar with. You will also need to be aware of any health testing requirements for your breed and the timing of these.

Dogs Victoria Regulation 20.1.12 states:

A member shall not breed with a bitch unless they have reached adequate maturity for that breed as determined by Dogs Victoria, without the prior approval of Dogs Victoria. Where the Rules, Regulations and Codes of Practice are otherwise silent, the minimum age for breeding a bitch shall be 12 months.

How often will she cycle?

The time between seasons varies quite widely – both between breeds and between individual bitches. The average time between seasons being around 6 to 7 months. Primitive breeds (such as Basenji) may only cycle once a year, and cycles ranging from 4 to 5 months to 15 months are all considered quite normal.

One important thing to note is that each individual bitch will most likely cycle at the same interval throughout her life. Keeping records of each season will be very useful in predicting the timing of the next cycle or for detecting potential issues that may cause the interval length to change.

Each season's duration is also highly repeatable for the individual, so noting the days where your bitch seemed receptive or when her discharge started and stopped can help you prepare for subsequent seasons.

Normal Reproductive Anatomy & Physiology

What is pseudo-pregnancy?

Pseudo-pregnancy (or phantom pregnancy) occurs due to the unique hormonal cycling that occurs in the bitch. Regardless of whether she was mated or not, if she does not fall pregnant during a cycle, the bitch will enter a period of pseudo-pregnancy during dioestrus due to the effects of the hormone Progesterone. It can affect different bitches in different ways.

For some bitches, there may be physical signs such as weight gain, increased appetite, mammary gland development or even milk production. For others, the changes may relate to their behaviour. They may become withdrawn, clingy or moody. They may begin nesting behaviours or take on inanimate objects as their 'pups'. This mothering type behaviour can extend to displaying maternal aggression if she feels her 'pups' are threatened.

The signs of pseudo-pregnancy usually resolve on their own as this part of the cycle ends, but there are some associated risks such as pyometra (uterine infection) and mastitis (mammary gland infection) that can occur during this time.

Important!

If the symptoms of pseudo-pregnancy in your bitch are particularly severe, please consult your veterinarian for advice.

Normal reproductive anatomy of the male

The reproductive tract of the male includes:

- The Scrotum – which houses and provides for temperature regulation of the testes
- The Testes - which are responsible for sperm production and the production of the male hormone testosterone
- The Epididymis – which stores the sperm and is where the sperm mature
- The Spermatic cords which contain the spermatic ducts (joining the epididymis to the urethra), nerves and blood supply to the testes
- The Prostate – which produces the fluid part of the semen
- The Penis – including the os penis, bulbus glandis, glans penis and urethra
- The Prepuce – which covers the penis when it is not erect

Normally, the testes will have descended into the scrotum well before puppies are six weeks of age. However, in some of the smaller and toy breeds, it may take a little longer. Prior to puberty, the testes remain small, but as they begin to produce the hormone testosterone, they will start to enlarge as sperm production begins.

Important!

Although it is possible for a male with only one testicle descended to sire a litter, this trait is considered a serious fault and a hereditary defect. You should only use a male dog that has two fully descended testes to sire a litter.

Dogs Victoria requires that the Stud Dog owner signs a declaration stating that the 'dog is entire, that it has two apparently normal testicles descended into the scrotum' as part of the Litter Registration process. Making a false declaration comes with serious penalties.

Dogs Victoria Fact Sheet
Breeders and Breeding

Normal Reproductive Anatomy & Physiology

Male puppies can be capable of siring a litter quite early, so it is important that you treat all young males as if they were fertile if you have a bitch on season on your premises to avoid the risks of an accidental mating.

There are no seasonal changes in the male dog's sexual activity – if they are presented with a female who is in season, they will mate her.
The penis of the dog has a number of unique features. It has a small bone in it called the 'os penis' that assists with rigidity and a bulbous region that is responsible for the 'locking together' (called a 'tie') seen during a mating.

Both urine and semen exit via the urethra, so there is only one opening at the end of the penis. When not erect, the penis is usually covered by the prepuce (a sheath of skin).

Important!

Aside from the German Shepherd Dog (minimum 18 months of age), there are currently no rules regarding the minimum age for a Stud Dog.

However, if your breed has specific health testing or screening requirements, these should be completed ***before*** *the male is made available at stud or allowed to mate a bitch.*

Depending on the testing required, this may impact the age at which a male dog can first be used at stud. For example: x-ray scoring for hip and/or elbow dysplasia cannot be done until the animal reaches 12 months of age.

Testing semen quality

It is possible to have semen collected from a male dog for the purposes of semen evaluation or for freezing for future use.

Although a basic examination of semen quality can be performed by just about any veterinarian, if you are looking to have semen frozen or if your male has failed to get a bitch pregnant, then you should consult a veterinarian who specialises in reproduction.

The quality of semen can vary widely within an individual over time. Sperm production can be influenced by age, nutrition, injury and illness.

Sperm is produced in the cells of the teste and then undergoes a period of maturation and storage within the epididymis. If a male dog is not getting used at stud often, or if there are issues during sperm production, there can be abnormalities in sperm development that mean the individual sperm will not be able to move through the female's reproductive tract or fertilise an egg.

Important!

Older males, in particular, can have reduced fertility, so if you are planning on breeding to an older male, or if another breeder has requested to use an older stud dog of yours, it is a good idea to have their semen quality checked prior to the mating.

Having a male collected is generally fairly simple, although having an on season female is usually required. This 'teaser' female can be of any breed or age as there is no risk of a mating occurring; however, some males can be a little fussy.

Collection of a sample allows a proper assessment to be made ahead of time and also 'flushes out' any older or stale sperm that may have been stored in the epididymis. If any problems with the male's fertility are detected, there may be strategies that can be employed to increase his fertility prior to the breeding, or alternative arrangements can be made without having to go through an unsuccessful mating.

Normal Reproductive Anatomy & Physiology

Freezing semen

If you have a young male who is of excellent quality, you may consider having some semen collected and frozen for future use. Frozen semen can last indefinitely and can be shipped anywhere in the world, provided the health testing requirements of the importing country are met at the time of collection.

Semen freezing is only performed by specialist reproduction veterinarians or technicians. It requires special equipment for collecting, treating and freezing the semen. After the male dog is manually collected, the sperm is removed from the semen sample, mixed with a special 'extender', and then frozen as 'pellets' in small vials, or in 'straws'.

The vials or straws are placed into storage in liquid nitrogen at minus 196 degrees Celsius and must remain frozen until just before it is ready to be used. The vials or straws are stored on labelled 'canes' within the storage tank, and the level of liquid nitrogen needs to be checked and topped up regularly – this is not something you can do yourself.

Instead, you will pay a storage fee based on the number of straws or vials, and the semen will be stored at the reproductive facility. If it needs to be moved or shipped, a special 'shipper' is used to keep the temperature right during transport.

When it is time for the semen to be used, it is gently thawed. Frozen semen is far more fragile than fresh semen and does not last as long in the female reproductive tract, so the window for success is much smaller. Therefore, a frozen semen mating requires that the bitch is at her most fertile (determined by a series of blood tests), and the semen is deposited high in the reproductive tract (either surgically or via an endoscopic tube placed through the cervix).

Important!

If you are considering having your male dog collected for frozen semen, the best time to do it is when the dog is young and healthy, when their semen quality is at its highest. Generally, this is around 18 months to 3 years of age.

In most cases, the collected ejaculate will provide enough semen for multiple matings. However, this will vary based on the size of the male and the quality and volume of the collected sample.