

# Breeders Education Package

Adopted by Office of Racing Integrity

Department of Primary Industries,  
Parks, Water & Environment



# Breeder's Education Package

Unit One – Getting Started

Unit Two –The Pregnancy

Unit Three – Whelping the Litter

Unit Four – Raising the Litter

Information provided in this document has been reproduced with kind permission from the author Dr Linda Beer BVSc MACVSc(Animal Behaviour) CMAVA and Greyhound Racing Victoria.

# Unit I - Getting Started

## So you think you want to breed a litter of Greyhounds

Many people who get into the sport of greyhound racing consider breeding a litter at some stage. Some may have had a successful race bitch who they have now retired and hope that she will be able to pass on her talent to her offspring; others might see it as a way to have involvement throughout their racing dog's life. Unfortunately, many people decide to breed in the mistaken idea that they might be able to re-coup some money from a bitch that might not have been a great performer on the track.

Most new breeders are unaware of the amount of time, effort and money that goes into successfully producing a litter of pups. Breeding a litter takes a lot of thought and preparation. There is the extra care and supervision of the bitch, followed by the enormous amount of work when the puppies arrive.

***Remember: If you are seriously considering breeding, then start to think about, and prepare for the whole process well before the breeding is to take place.***

Breeding is not a cheap exercise. Costs include the stud fee, vet fees (especially if you choose to inseminate the bitch using frozen semen), increased feed costs, registration, vaccination, worming, not to mention the surprise costs that can occur when things go wrong (such as when a pup gets sick, or the bitch needs a caesarean to whelp). Add to this the enormous amount of time and labour that goes into caring for the litter, and you start to see that breeding a litter is quite a costly exercise.

***You need to think about both expected and unexpected costs when breeding a litter before you decide to commit to breeding a litter of pups.***

Every step of the way, you need to 'get it right' to ensure your pups can reach their genetic potential. Growing pups need the benefit of the best possible food, the right amount of handling and exercise, and close monitoring if they are to develop into athletes. Taking short cuts with pups is false economy as you are only reducing the likelihood of your pups making it to the track.

You also need to think about what you plan to do with the pups you breed. Will you sell all or some of them? Or, will you be retaining them for yourself. If your bitch has a large litter, it may be impractical to keep all the pups and you will have to decide which you are going to keep. Unfortunately, some breeders end up keeping too many dogs because they are worried they might accidentally sell the 'big winner'. Suddenly they are cutting corners on feeding and rearing the pups and all they end up doing is ruining any chances they had of success.

***Remember: Having more dogs does not increase your chances of winning if all you are doing is cutting corners. You are better focussing on one or two pups and really doing everything right.***

You also need to think about what will happen to those dogs that do not make the track. Not every puppy you produce will be a race winner. In fact, statistics tell us that almost half of the dogs that are bred never make the track at all. Greyhounds are fantastic dogs, and many make great pets. Understanding the Greyhound Adoption Program (GAP) and what is required can help you prepare any pups that are not going to make it as race dogs for a second chance at life.

***Remember: Under the Rules of Greyhound Racing you are responsible for the greyhounds you own and you are required to think and act in a mature way when considering the future of your greyhounds if and when they retire as racing or breeding greyhounds.***

### **Finding a Mentor**

If you are seriously considering breeding, the first thing to do is to find yourself a suitable mentor. Mentors are people who have been in the industry over a long period of time and who have had success over a number of years, not just one or two good dogs. They should be knowledgeable in all facets of the industry with a good understanding of genetics, anatomy, and breeding. Look for someone who is well respected and has a good reputation within the industry.

A good mentor is worth their weight in gold. They are a source of information that is not going to be found in books or on the internet. Ask lots of questions and listen to their answers. Discuss your breeding plans with them and ask for their opinions. Assisting your mentor with their whelpings and helping them with the care of their pups is also a good way to get some experience and to see if breeding is for you.

***Remember: If you are seriously considering breeding, start to think about finding a mentor - well before the breeding is to take place***

### **Finding a Veterinarian**

Having a good relationship with a veterinarian is also important. If you are planning to use frozen semen on your bitch, you will have to use one of the approved frozen semen facilities registered with the various state authorities. If you are close to one of these facilities, it may be that you use these vets throughout your breeding career, but if they are further a field, you are going to have to establish a relationship with your local greyhound vet.

Discussing your litter with your vet is also a good idea as they can help advise you about nutrition and care of the pregnant bitch, along with what to do when things go wrong. They are also the one who is likely to be woken at three in the morning when your bitch needs a caesarean.

***Remember: If you are seriously considering breeding, start to think about finding and establishing a good working relationship with a veterinarian well before the breeding takes place.***

### **Understanding the Paperwork Requirements**

Throughout the breeding process it is a requirement under the Rules of Greyhound Racing that various forms are submitted to the Office of Racing Integrity. It is important that you

understand which forms need to be submitted and when. That way you will be prepared, and there will be no hold-ups when it comes time to sell your pups.

### **Transferring the Breeding Female into Your Name**

If you are not already the owner of the breeding female, she must be transferred into your name. Alternatively, if you are just leasing a bitch, then an 'Authority to Breed' (Breeding Lease) must be submitted. This way you will be listed as the breeder of the litter, and you will receive all of the necessary paperwork by mail.

### **Registration of Breeding Female**

Prior to having the breeding female mated, she must be registered with ORI for this purpose. An application form must be submitted together with evidence of a current C5 vaccination. A DNA fingerprint result must be recorded with Greyhounds Australasia and the female must have an approved microchip implanted. Breeding rules state that a female can only breed until she is 8 years of age and must only produce 3 litters and no more than 2 litters in an 18-month period. To continue using a female for breeding after she reaches 8 years of age or following her third litter, an application for an exemption to the breeding rules must be submitted. Tasracing has set some criteria which looks at status and performance history of the breeding female's progeny. Registration of the female must be renewed every 12 months by submitting a C5 vaccination certificate.

### **DNA Testing**

If this is your bitch's first litter, she will have to be DNA fingerprinted. This must occur well before she is inseminated as it is a requirement of registration. The DNA test can take 6-8 weeks to come back, so it is a good idea to get this done early so that registrations are not held up. The required forms can be obtained by visiting the Greyhounds Australasia website ([www.galtd.org.au](http://www.galtd.org.au)) or by telephoning Greyhounds Australasia on (03) 9548 3500. The test (which only needs to be performed once) is a simple mouth swab, which is done by a veterinarian.

### **Notification of Service**

ORI must be notified that your bitch has been served. This form is submitted by the studmaster in the case of a natural mating or AI using fresh or chilled semen, or the inseminating veterinarian will submit the form with the fee in the case of frozen semen to GA who will notify ORI. It is a requirement that the form is submitted within 14 days of the service occurring.

### **Transfer of Ownership of a Breeding Unit**

If you plan to use frozen semen, you will need to have the breeding unit(s) that you intend to use transferred into your name prior to using them. Any transfer of Breeding Units needs to be notified within 14 days of the transfer with the person selling the unit submitting a form, and you as the new owner also submitting a form. You should contact Greyhounds Australasia to obtain the necessary application form.

### **Result of Mating Notification**

Once your bitch has whelped, you are required to notify ORI of the number of pups of each sex in the litter, along with their colours including information about any deceased pups. If your bitch misses, (ie, she fails to whelp any live pups) then you must notify ORI that she has missed. This form needs to be lodged within 14 days of the whelping date, or in the case of a miss, within 14 days of the expected whelping

date. If, unfortunately all pups are deceased, this must be notified together with a written explanation as to the reasons for their death.

### **Litter Registration**

Once the result of mating has been submitted, ORI will supply you or the Marking Official (dependent on your area) with the necessary paperwork to allow ear-branding to be completed. Pups must have a C3 vaccination between 6–8 weeks of age with the veterinary surgeon recording reference to their sex and colour. You will have to contact the ear-brander and arrange a time for him to come and mark the pups. This should be completed when the pups are around 8-10 weeks of age. Following this the pups will need to be implanted with an ORI approved microchip. You should organise for a ORI Approved Implanter to microchip the pups between 10–16 weeks of age. A C5 vaccination should be completed in accordance with the rules between 10 and 16 weeks of age. Once all of the above is completed the Litter Registration form will then need to be submitted along with proof that the pups have been vaccinated. (Vaccination of all pups with the minimum of a C3 vaccine at 6-8 weeks and C5 vaccine at 10-16 weeks is compulsory). The Litter Registration form is due within 4 months of the pups whelping date. Approval must be given for any extension of this time.

### **Sale of Pups**

When you sell a pup, it is a requirement that you provide the pup's application for registration (naming) papers to the new owner, which you should sign on the reverse side where required along with written information about the keep and care of greyhounds (as per the Recommended Standards of Care). You should keep a record of sale by completing the Breeders Record Sheet provided with other application forms. A transfer of ownership for an unnamed pup should be completed and given to the new owner to lodge with ORI within 10 days. (It is not necessary for the new owner to hold a licence unless they intend to name and race the pup, which can be obtained at a later date)

***Remember: If you are seriously considering breeding, start to think about understanding the paperwork requirements - well before the breeding is to take place***

### **Starting a Breeding Program**

The first step to starting a breeding program is to learn everything you can about greyhounds, greyhound racing and breeding. It may be that you attend seminars, read books or search the internet for information. There are also a number of chat sites dedicated to Greyhounds, but remember anyone can be an expert online.

The more you know about greyhounds and racing, the better the choices you will make. Study pedigrees of dogs that you admire, and dogs that perform well. You will probably notice that there are definite trends and families that do better than others. If you are going to purchase a brood bitch, try to get the best bitch that you can afford and have your mentor help advise you on suitable bitches. Remember: pedigrees are helpful but the racing form of the bitch you purchase is more important than anything on paper.

Next you will need to select a stud dog that will complement your bitch and any faults she might have. Maybe you are looking for a little more early speed, maybe for a little more

strength or endurance. Discuss the list of potential mates with your mentor. Your aim should be to use the sire that is best for your bitch, not just the dog down the road that belongs to a friend and is convenient to access.

Becoming a successful breeder often takes time. It also requires critical analysis of your own actions. In this regard when you have raised a litter, be critical of what you have managed to achieve – where could you have improved or done things better? You should aim to get better at breeding each time you have a litter – this is the hallmark of a successful breeder.

### **Basic Breeding Principles**

Many breeders find the actual science of genetics very daunting. There are many good references that can help breeders better understand genetics and how dogs inherit traits from their parents. A list of references is located at the back of Section Four.

Many breeders will use terms such as ‘Line-breeding’ or ‘Out-crossing’ without really understanding what they mean. There are many ideas about the ‘right’ way to breed dogs, with many of them contradicting each other.

Some basic concepts:

- All puppies get half of their genes from their mother and half from their father.
- The genes can be thought of as the ‘Instructions’ for building a racing greyhound.
- The actual assortment of genes each puppy receives from each parent is random, with some puppies getting more of the ‘good genes’ than others. No two littermates have the exact same genes (unless they are twins), even though they come from the same parents.
- Because all dogs carry some ‘good’ genes and some ‘bad’ genes, no matter how good the dog is on the racetrack they will all produce some inferior puppies.
- Certain traits are more likely to be passed on – they have what is called ‘high heritability’. Other traits may have a low heritability.
- Temperament traits (i.e. aggression or fearfulness) are HIGHLY heritable – this means if you use a bitch that is aggressive you are more likely to produce puppies that are aggressive.
- ‘Line-bred’ animals have a common ancestor behind each parent within the first 3-4 generations. The aim of line-breeding is to try to stabilize desirable traits by increasing the frequency of the desired genes in the pups.
- ‘In-breeding’ is the mating of closely related animals such as brother-sister, mother-son etc. Inbreeding is best avoided by inexperienced breeders as it can lead to ‘doubling-up’ on problem genes, and depression of fertility.
- An ‘Out-cross’ is a mating of two basically unrelated animals. This means that they do not have any common ancestors for at least 6 generations. The two individual dogs may still be line-bred themselves; they are just not related to each other. Out-

crossing is generally done to introduce a desirable trait, or to try to increase 'hybrid vigour'.

- A 'pedigree' is a list of ancestors for a particular individual. Although all the dogs in the pedigree have some input into the individual, the first 2-3 generations are the most important and influential. For example, a dog appearing in the 6<sup>th</sup> generation may only contribute 1% of the genetics for the pup in question. Even if a dog appears a number of times in the 5<sup>th</sup> or 6<sup>th</sup> generation it still might only have a small influence (might increase to 2%) on the genetics of the pup.
- 'Progeny records' are a list of the offspring from an individual. They are by far the most important indicator of a dog or bitch's ability to produce successful pups.
- The genes form the dog's 'genetic potential', this is then influenced by other things such as nutrition, exercise and handling. A well bred dog can be ruined by poor nutrition and care and never actually reach its full potential. Conversely, all the good food and care in the world is not going to turn a poorly bred dog into an athlete.

***Remember: If you are seriously considering breeding, start to think about understanding basic breeding principles - well before the breeding is to take place***



## **Selecting a Foundation Bitch**

Starting off with the best bitch that you can should be a priority. Why start with a lesser bitch and spend two or three generations to get to where you could have started?

A city winning bitch with a good pedigree (lots of city winners in the first few generations) is certainly the ideal starting point. Not everyone can start here, but you should certainly look at the bitch's form. If she has been mated previously check the form of her offspring before deciding if you think she has the potential to produce good quality dogs. If she has not managed to produce any winners within one or two litters, it is very unlikely that she will suddenly produce a good dog.

Because temperament is more highly heritable than many other traits, avoid bitches who are non-chasers, or who are 'fighters'. You are also probably best to avoid bitches who are extremely fearful or shy.

Unless there are problems with the male's fertility, it is actually the bitch who determines litter size based on the number of eggs produced. Look for a bitch who has come from a large litter herself, rather than one who came from a small litter. Smaller litters are more likely to lead to problems such as the need for caesarean section, and of course the costs of the litter are spread over fewer pups. Ask the previous owner for as much information as possible about the bitch's reproductive cycle – when she was last on season, how she cycles, the day(s) she was mated etc. The more information you have the better.

A dam's litter size is usually fairly constant over time, although older bitches tend to have fewer pups. The bitch's mothering skills are also important. Select a bitch that comes from a line of good mothers, and avoid bitches that have been hand raised themselves. Having a litter is hard enough without having to bottle feed 10 puppies because the mother won't feed them!!

***Remember: If you are seriously considering breeding, try to make sure that you find a good foundation bitch to start with - well before the breeding is to take place***

## **Selecting a Stud Dog**

Selection of a suitable sire for your bitch is a very hard decision. There are glossy adverts, varying stud fees, and 'popular' sires to consider. How do you find the dog that is right for your bitch? You should not just use the popular stud of the day, or the dog that seems to have done the most winning, it is far more important to seek out the sire that actually produces the traits that you desire in their progeny, and one that compliments your bitch.

Although the cost of the stud fee may be a factor, don't just use the cheapest dog, or the one that is located conveniently close to home thinking you will save money. The cost of the stud fee is only a small part of the cost of whelping and raising a litter - it costs just as much to whelp and raise lesser quality pups as it does good quality pups!

The first step in selecting a suitable sire should be to list your bitch's strengths and weaknesses. Once you have these, you need to prioritise the things you would like to improve. This then becomes your 'shopping list' as you consider each sire. When considering a sire, remember you do not want to double up on faults or weaknesses.

Sires are advertised in local and national publications and online. Advertisements often list the achievements of the sire during his racing career, along with the contact details of the studmaster. Don't be fooled by clever advertising – read carefully the information supplied. All studmasters are going to highlight the best things about their stud dog, and not mention anything negative. Just because a sire is well advertised, does not mean that he is a good sire.

Next, you need to list each of the available sires and decide which of these sires has the desired traits that you are seeking, and which don't. You will also need to look at the progeny he has already produced to ensure that he passes these traits on to his offspring as well. Progeny data is probably the most important information as this tells you what the dog actually produces.

***There are many good racing dogs who have failed to produce winning puppies when they have stood at stud. Take a good look at the progeny a stud dog has produced before deciding whether or not he is likely to produce winners for you.***

A good place to start is to look at the 'Top Ranking' sires lists that compare the number of winners for each sire. Remember, these lists do not tell you how many pups were produced to reach these totals, so you are not necessarily comparing apples to apples. Obviously, if two sires have both produced 15 city winners each and are equally ranked in the 'Top Sires' lists based on winning progeny, the sire who has sired 150 litters is nowhere near as efficient at producing winners as the sire who has sired 30 litters to achieve the same result.

Knowing when a sire started his career is also important. If the sire is in his first or second season, he probably will not have many of his pups racing as they will be too young. This will influence the amount of progeny data that is available, and he may appear lower on the ranking list.

If possible, look at the performance of any offspring from bitches that are related to yours as this will give you the best idea of whether the two dogs are likely to mesh well. Remember when looking at progeny, you need to look at the average over all progeny, not just the feats of one or two exceptional offspring. More progeny data can be obtained from [www.greyhound-data.com/breed.htm](http://www.greyhound-data.com/breed.htm) This is a very valuable resource with incredible amounts of information for those who are eager to study pedigrees.

As we know, each pup in a litter gets slightly different genes. This means that mating your bitch to the brother of a top sire is not the same as mating her to him. The lesser brother is probably that way because he does not have quite so many of the 'good' genes, and hence he will not have them to pass along to his offspring.

Once you have decided on the stud dog, it is time to contact the studmaster. He will want to know when your bitch is next due on season, so that he/she can know when to expect your bitch. Remember that stud dogs are limited to the number of bitches that they can serve each quarter.

You will also need to discuss with the studmaster the costs associated with the mating and any conditions of service (conditions of a return service, refunds – should your bitch fail to produce pups). It is best to have a written contract listing exactly what is expected and what is included.

**Remember: If you are seriously considering breeding, start to think about understanding stud dog selection and the conditions of a stud service - well before the breeding is to take place**

### **Things to ask:**

Aside from the stud fee, are there other costs involved?

Additional costs may include progesterone testing (a blood test that indicates when your bitch should be inseminated), AI using fresh semen, or boarding costs. If you are buying frozen semen, where is it stored? You may need to ship the straw(s) of frozen semen to your facility of choice and there will be a fee to do this.

Are there any requirements prior to mating?

Some studmasters insist that the bitch has a swab (veterinary test for infection) done prior to mating, and if so, you will have to find out when they would like it done. It is normal for the swab to come back indicating some bacteria – the healthy reproductive tract has a normal population of ‘good’ bacteria. If your bitch has unusual levels of ‘bad’ bacteria, she may need a course of antibiotics prior to mating, but it is important not to use antibiotics unless they are needed as they also kill the ‘good’ bacteria, which can then pre-dispose the bitch to more serious infections developing.

What happens if the bitch does not get in whelp?

Some studmasters will offer a ‘free return’ meaning you can bring your bitch back the following season and try again. If this is offered are there any limitations? This might include a time limit, or might specify that the free return is only to be used on the bitch specified. Some studmasters will refund part of the stud fee instead of offering a free return, others will not offer anything.

These days it is strongly advised that you insist that the studmaster uses progesterone testing to determine the correct time to mate your bitch, even if the mating is to be a natural one. If the mating occurs at the wrong time, and the bitch misses, it is going to mean that you have to wait another 6-12 months before you have another opportunity to breed her. The cost of a few blood tests is only small when compared to the feed and care costs whilst waiting for another chance to mate your brood bitch.

It is important that you are totally clear about what you are getting for your money. It is too late after the bitch has been served to start arguing about what you thought you were getting for your service fee. As it is a private contract between you and the studmaster, the various state greyhound racing authorities will not get involved if there is a dispute.

**Remember: If you are seriously considering breeding, start to think about preparing your bitch and giving her the best chances to whelp a healthy litter of pups - well before the breeding is to take place**

# Unit 2-The Pregnancy

## The Mechanics of Mating – Getting your bitch pregnant

Many years ago, the accepted practice for mating was to put the stud dog and the bitch in together on day ten of her cycle, and again 2 days later – very little was known about the bitch's cycle and there were no tests to determine when she was actually ready to be mated.

Luckily, science has progressed where we now have a number of different methods of getting bitches pregnant along with ways to tell when she is most fertile and should be mated. Frozen semen technology means we can now access dogs from interstate or overseas without the need to ship the bitch to the dog, opening up a lot more opportunities to capture the best bloodlines. Artificial Insemination techniques are getting better and better as new freezing techniques and extenders are used.

### **Getting the timing right**

Timing the mating of a bitch is very important. Get it wrong and you will find the bitch either has a very small litter, or worse still, misses altogether. This can be very frustrating as you then have to wait six or more months before you can try again.

The first step to getting the timing right is knowing when your bitch is due to cycle. This way you can be checking her regularly and will certainly notice when she first comes in. Marking her seasons on your calendar will give you lots of information. Bitches tend to cycle regularly – maybe every 6 months, maybe every 10 months - each is an individual but they tend to repeat the same interval each time.

Knowing how long her season is normally is also helpful. If she bleeds for 4 weeks, it may be that she ovulates later than most bitches, if you hardly notice any blood at all, she might be a 'short cyler' and ovulates early. Luckily we now have a blood test that can tell us when the bitch is likely to ovulate – the progesterone test. This replaces the older, less reliable methods of detecting ovulation such as vaginal cytology, changes in discharge colour, or relying on the stud dog to know.

By taking repeated progesterone tests over a number of days, the rise in the progesterone level that is associated with ovulation can be detected. This is certainly essential if you are using frozen semen as it is much weaker than the fresh variety. Frozen semen does not live for very long after insemination, meaning the timing has to be spot on. On the other hand, fresh semen can survive a few days, and has even been known to last up to a week which increases the chances of live semen being present when the eggs are ready to be fertilised.

### **Natural Matings**

Some studmasters will allow their stud dogs to perform natural matings, although the more popular sires are more likely to be mated using artificial means due simply to the number of bitches they would have to mate.

During a natural mating the dog is allowed to mount the bitch, and 'tie' with her (this is where the dogs remain 'stuck' together for a period of time, usually tail to tail). Natural matings require a bitch that will 'stand', and a dog who is physically capable of mounting the bitch. Older males may find natural matings physically challenging, and there can be difficulties if there is a large size difference between the dog and the bitch. Sometimes, the studmaster may assist the dog by standing a tall bitch down hill, or by physically assisting the dog to mount.

### **Artificial Insemination – Fresh**

If the bitch will not stand or the stud dog is not able to mount the bitch, or in cases where the stud dog is required to serve many bitches, the studmaster may decide to use artificial insemination instead.

Usually the semen is collected from the dog after giving him a chance to sniff the bitch. Sometimes the dog will even be allowed to mount the bitch, but the 'approved person' will re-direct the dog, allowing the semen to be collected into a warmed container. From here the semen is drawn up into a syringe, and a catheter is used to inseminate the bitch almost immediately.

If the dog lives interstate, another option is the use of chilled semen. The semen is collected similar to frozen semen, but instead of being frozen, the semen is chilled for transporting. The semen can then be shipped and inseminated into the bitch. Timing of semen collection is vital with this method as the semen only lasts about 3 days when chilled. This method is used quite a bit in the USA, but is less commonly used in Australia.

### **Artificial Insemination – Frozen Semen**

The use of frozen semen is becoming increasingly popular throughout the greyhound industry. Through a special process the semen from a dog is collected, processed and then frozen into 'breeding units'. The frozen semen can then be shipped around the country or around the world. This means that it is possible to have access to dogs that would not otherwise be available (maybe due to quarantine requirements, or because the dog is deceased).

A stud dog may have frozen 'breeding units' located at a number of facilities. When you apply to the studmaster to use the dog, you will need to have one of these units transferred into your name prior to you being able to use it. It will then need to be shipped to the facility that you plan to use in a special 'shipper' that maintains the temperature of the semen so it does not thaw.

When the bitch is ready to be mated, the frozen semen is carefully thawed, and then used to inseminate the bitch, either trans-cervically (a non-surgical method), or surgically. It is vital that the bitch is at the correct stage of her season as frozen semen does not live as long as fresh semen, and is not quite as robust. The inseminating veterinarian will examine the semen after it is thawed to check its quality and post-thaw motility.

Surgical insemination involves anaesthetising the bitch and making a small incision in her abdomen so that her uterus can be gently lifted out. The semen is then injected directly into the uterus via a fine catheter with half of the semen being injected into each side (called

'horns') of the uterus. The uterus is then gently placed back, and the surgery site is sutured shut.

Trans-cervical insemination is preferred by some AI facilities as it does not require the bitch to have a general anaesthetic. With the bitch awake and standing, a fibre-optic scope is used to guide a special catheter through the cervix, and the semen is deposited inside the uterus. Done by an experienced and proficient person, this method can be completed quite quickly, and the results are thought to be similar to the surgical method.

Which method is used will depend on the facility and the veterinarian that you use. It is a good idea to talk to the person who will be doing the insemination before the bitch comes into season so that you know exactly what they need from you, and what is involved. You will also want to know what the costs are likely to be, and make sure the semen arrives well in advance so that there is no last minute rush.

***Remember: If you are seriously considering breeding, start to think about understanding the mechanics of mating - well before the breeding is to take place***

### **Care of the pregnant bitch**

Well you have done all the planning, and the bitch has been mated. You will have made sure that she was in top shape prior to being mated, and now it is up to you to give her the best of care to ensure that her pregnancy is uneventful.

First of all you are going to be eager to know if she is in whelp. Bitches have the same hormone cycles whether they are pregnant or not, and they can have a 'pseudo-'or 'false' pregnancy as a result. It is quite normal for a bitch who is not pregnant, and who was not even mated, to put on weight and produce milk. They may even display the behaviours associated with whelping such as digging a nest or mothering things. So it is not reliable to use behaviour, teat development, or even weight gain as indicators.

Instead there are a number of techniques to determine if a bitch is pregnant. There is no real way to tell within the first few weeks of the pregnancy, but once the bitch reaches the third week it may be possible for an experienced person to palpate (feel) her gently and feel the pregnancy.

Another, more reliable, way to see if your bitch is pregnant is to have her abdomen examined by ultrasound (similar to in humans). Ultrasound is the preferred method of pregnancy detection as you can actually see the puppies and it is sometimes possible to get an idea of the number of pups to expect. With ultrasound the heart beat of the puppies can be seen from about Day 28 of the pregnancy.

X-rays can be used to detect pregnancy, but not until the last week or so when the bones inside the puppies start to calcify. An x-ray is often used to check for any remaining pups if a bitch is having problems during whelping, or to determine litter size in the case of small litters.

### **Nutrition of the Pregnant Bitch**

In the early stages of pregnancy, it is important not to over feed your bitch. She should continue to eat a well-balanced diet at the same rate as before she was pregnant. If her diet

is nutritionally balanced and complete, she will have no problems growing puppies. If you over feed her, she will put on weight and this predisposes her to problems giving birth.

If you feed a diet that is not balanced, you will deprive the bitch and growing puppies of vital nutrients. Over-supplementation is just as dangerous as a diet that is lacking in essential nutrients. In particular, over-supplementation with Calcium during pregnancy can be particularly detrimental and can lead to problems when the bitch has whelped.

As the bitch moves into the latter stages of the pregnancy, her intake of food will need to increase, but you may have to increase the number of meals, rather than increase the amount in each meal. This is because the puppies will be taking up much of the space in her abdomen and this does not leave a lot of room for the stomach to expand. If you are feeding a dry kibble, you may choose to gradually change the bitch over to a puppy formula as these are more energy dense and tend to have slightly higher levels of protein and calcium.

If you are not sure if what you are feeding is suitable, please take the time to consult your vet about what you should be feeding.

### **Exercise**

It is important that your bitch continues to exercise regularly. Fit, healthy muscles are necessary to help push the puppies out. Your bitch should have some exercise everyday, although the amount may decrease as she gets nearer to her due date. If it is summer time, make sure she exercises in the cooler parts of the day, rather than in hot weather, as you want to avoid extremes of temperature.

Early in her pregnancy, it is quite safe to run the bitch with other dogs, provided they are compatible, but as she gets to the more advanced stages of pregnancy, she probably will not want to be bumped and jostled with, so you might prefer to exercise her on her own.

### **Other care**

Make sure your bitch is up to date with all her worming and parasite treatments. Before using ANY product or medication on your bitch read the label carefully to ensure that it is safe to give a pregnant bitch. **If you are not sure, don't use it.**

It is important that your bitch is maintained in the best possible health. If she does become unwell, be very careful that any necessary treatments are safe. There are some drugs that should never be administered to bitches when they are pregnant because they may affect the unborn puppies, other medications may cause the bitch to abort the pups. Always make sure that your vet is aware that your bitch is in whelp, and do not administer any medications yourself unless you are 100% sure they are safe.

***Remember: start to think about care, nutrition and exercise for the pregnant bitch - well before the breeding takes place***

## Unit 3-Whelping a Litter

As your bitch's due date draws nearer it is important that you are well prepared for the impending birth. Make sure you are ready well ahead of time, so that you do not have to panic if the bitch decides to give birth a few days earlier than expected.

You will need to decide where the bitch is going to whelp the pups. Most people use a 'whelping box' – a wooden or fibreglass box with sides that allow the bitch to jump in and out, but high enough to keep the pups confined. The whelping box needs to be located somewhere warm, dry and quiet where it is easy to access and there is good light. Puppies are particularly susceptible to the cold, so making sure that the whelping box is out of drafts is important.

You may want to borrow or hire a whelping box if it is your first litter or your mentor might be able to loan one to you. Make sure the whelping box has been thoroughly cleaned inside and out with dilute bleach and then rinsed clean so there are no fumes or residue. Once the whelping box is in place, line it with layers of newspapers and then place some bedding on top. You will want to get your bitch used to sleeping in the box a few weeks ahead of time otherwise she might be restless and unsure when you suddenly move her to a new place.

Newspaper is used inside the whelping box as most bitches will dig and shred the bedding as they start to go into labour and the newspaper can be easily replaced. Newspaper is also absorbent and can also be replaced as often as necessary if it gets soiled during the birthing process (which can be quite messy).

You will need to make sure that the whelping box is either in a warm room, or that you have a safe heat source to keep the pups warm. A heat lamp over one end of the whelping box can be a good idea as it gives the pups a choice of temperatures, but make sure that it is hung high enough that the bitch will not hit it or burn herself.

Finally, you will need to organise a few things to have on hand:

Pen and paper – for writing down the weights of pups, and the times they are born

Thermometer – for monitoring the temperature of the bitch prior to whelping

Gloves – if you don't like getting your hands dirty

Scales – for weighing the pups

Cotton thread and scissors – for tying off umbilical cords if needed

Betadine

Clean towels

Hot water bottle(s)

Plenty of Newspaper (no staples)

Garbage bag(s) – for all the soiled bedding

Your vet will also be able to give you advice and provide you with anything else that you might need. Most Vet Clinics can help you with a 'Whelping Kit' that contains Oxytocin and Calcium injections along with instructions, but as a novice breeder, a call to the vet when things go wrong might be the safer option.



***Remember: make sure that you are well organised and prepared for the whelping - well before the whelping is due to take place***

### **How will I know when the bitch is going to Whelp?**

Once you have bred your bitch you will have an 'expected date of whelping'. If your bitch has been put to frozen semen, the vet will have given you a date of whelping that is based on the timing of ovulation, rather than the actual date the bitch was inseminated. Make sure you write the date down on your calendar. The length of pregnancy is usually 63 days (9 weeks) from the time of ovulation.

During the last week of pregnancy, you can monitor the bitch's rectal temperature once or twice a day. The normal temperature for dogs is 38-39 degrees Celsius. It is normal for the rectal temperature of the bitch to drop below 37 degrees approximately 24 hours prior to the birth, so this is one way to monitor her.

Loss of appetite and restlessness are other signs to watch for. Some bitches go off their food a couple of days out, but others will eat right up to the hour before. Nesting will also occur in the last few days, although this will become more intense as the first stages of labour start.

If there is concern that the bitch has gone over time without any signs of whelping, or a caesarean is being contemplated, a blood progesterone level can be done to determine if the bitch is ready to whelp. Progesterone levels drop significantly at the time of whelping, and can be used to determine if it is the right time to carry out a caesarean.

***Remember: you need to make sure you know how to tell you bitch is about to whelp – revisit the signs well before the whelping is due to take place. Have an action plan in place should things go wrong?***

### **The First Stage of Labour**

During this stage the bitch will usually start nesting and is quite restless. She may shiver and shake, or may pant heavily. During this stage the body is preparing for the pups to be born but there are no visible contractions. Some bitches may vomit during this early stage of labour. Some bitches will become very clingy, others will hide. Make sure your bitch is in the whelping box at this time, otherwise she may end up having her pups somewhere else. Bitches like dark, quiet places, and she may hide. Many novice breeders get caught out when their bitch gets under the house or behind the shed when she is about to whelp, and it can become very difficult to get her (and possibly puppies) out.

This first stage of labour may last a few hours, or even a day. Many bitches will show signs of impending labour during the day, but it is common for bitches to whelp at night.

### **The Second Stage of Labour**

As she moves into the second stage of labour the bitch will actually start having contractions. The contractions may be spaced out to start with, as the first puppy usually takes the longest time to be born. Eventually the bitch will really bear down, and usually 4-5 of these hard contractions will see the first pup born.

In the uterus, each pup is enclosed in a sac of fluid and often the first thing that will be seen as the pup emerges is a 'bubble' of fluid at the bitch's vulva. As she pushes some more, the pup will appear – pups can be born head first or tail first – so you will either see a nose, or feet and a tail. It may take a few contractions to fully pass the pup.

Once the pup has been born, it is vital that the sac is removed so that the pup can breathe. This is usually something that the bitch will do. She will chew and lick at the pup until the sac breaks. She will then lick and nose the pup stimulating its respiration. If the bitch does not break the sac, you may have to step in and clear the membranes and fluid from the pups mouth so that it can breathe. You can also hold the pup in a towel and rub it to simulate the licking of the bitch. Sometimes you will have to do this if two pups are born close together and the bitch cannot deal with them both at the same time.

***Remember: the steps of a normal whelping – revisit them well before the whelping takes place. Whilst unlikely, you may need to help the bitch. Have an action plan in the event that things go wrong.***

### **Stage Three of Labour**

The third stage of labour is the passing of the placenta. Sometimes the placenta will come out with the puppy, other times it will be passed a few minutes later. It is normal for the bitch to eat the placenta and to chew through the umbilical cord. In most cases you will not need to do anything at all except supervise her to make sure she is not too rough (especially first time mothers).

If the bitch does not chew through the cord, or if the cord seems to be bleeding, you can tie off the cord with some clean cotton thread about a centimetre from the body of the pup. The excess cord can then be cut off with scissors. You can then dab the stump with a bit of Betadine to help prevent infection. After a day or two the umbilical cords will dry out and fall off all by themselves.

The bitch will then repeat the second and third stages of labour until all of the puppies are born. The time between puppies varies, and some bitches will rest even an hour or two between puppies. The main thing is to watch her closely. If she seems settled and calm, things are probably fine, if she is restless or contracting, then a puppy should appear within a short time or there may be problems.

Sometimes it can be hard to tell if the bitch is actually finished giving birth or whether she is just resting in between pups. If you can get her to stand you can gently feel her abdomen to see if you can feel more pups. Sometimes there will be a pup tucked right up under the ribs that might be hard to feel.

Make sure that you make a note of the time that each pup was born. This way if there are any problems you will know how long since the last pup was born. You can also note the colour, sex and weight of each pup as they are born. It might be a good idea to have an experienced person sit with you or at least be 'on call' during your first few whelpings. Otherwise, you might need to phone your vet if you are not sure if things are going to plan.

As a rough guide of things not going to plan:

- More than 30-40 minutes of strong contractions with no puppy
- More than 15 minutes of contractions with a pup visible
- More than 3 hours between pups
- A green discharge
- Lots of bright red blood
- A bitch that is very restless or who is crying or licking frantically at her vulva

Are all signs that things may be going wrong. Remember the earlier you get help the higher the likelihood of having live pups.

**\*\* These times are estimates, and it is best to confirm with your veterinarian when they feel that you should seek assistance.**

If a pup is visible it may be possible to assist the birth, but be careful not to pull hard on a puppy's head or tail as there is a definite risk of dislocation. Any assisting by pulling should be directed in an outward and downwards direction, towards the hocks of the bitch. If the pup seems stuck and some gentle traction does not help, seek immediate assistance.

Once the pup has been born and is starting to move about, it should suckle as soon as possible. The first milk of the bitch (the colostrum) is full of important antibodies that help keep the pups safe from infection. If the pup is having trouble, it may need to be assisted onto a nipple. The suckling of the pups helps to stimulate the natural release of the hormone oxytocin in the bitch which helps with milk let-down and stimulates contraction of the uterus.

***Remember: you need to be able to recognise when things are not going to plan – revisit the signs of complications well before the whelping takes place. Have an action plan in place in the event that things go wrong.***

### **When the bitch is finished**

When you are happy that the bitch has had all of her pups it is a good idea to take her out for a toilet break and give her a clean up. Some bitches get so messy they need a quick bath, but make sure that you dry her completely so she does not get cold. You can also encourage her to have some food and water, although many bitches will be too concerned about getting back to their litter to think about eating.

Now is the time to clean up all the soiled or wet newspaper and place clean bedding in the box. The pups can be placed in a basket or box with a hot water bottle (the hot water bottle needs to be wrapped in a towel so they do not get burned) whilst you do this.

Make sure once she is settled again that all of the pups have had a good feed and that any smaller or weaker pups have a chance to access to the best teats (the ones at the back). The bitch will probably spend the next few hours resting and cleaning the pups. It is normal for

the bitch to have some discharge, and it may continue for 4-6 weeks. The colour of the discharge may be reddish brown through to a blackish green, but should never be smelly or creamy in colour. If you are concerned about the amount or the colour of the discharge, ask your vet for advice.

Many vets recommend that you bring the bitch and pups in to the clinic within the 12-24 hours after birth (usually the next morning) for a post-whelping check. They will check that the bitch has truly passed all of the pups and give her an injection of Oxytocin to help clear out her uterus. They also check that she has adequate milk and inspect all of the puppies to see that they are healthy.

# Unit 4-Raising the Litter

## The First Few Days

It is important that the bitch and pups are checked regularly in the first few days. First time mothers are especially problematic as they may not settle straight into being a mother. You may need to supervise constantly to ensure the bitch does not trample or lie on her pups, and you want to make sure that all of the pups get a fair chance to suckle.

Probably the easiest way to make sure the pups are doing well is to weigh each pup daily. You will need to have a way of identifying each pup. By weighing you will be able to pick the pups who are struggling and may need extra help to keep up with the rest of the litter. In the first 24 hours it is normal (but not ideal) for some pups to lose a little weight, but after that there should be a definite gain each day, even if it is only a few grams. Pups that stay the same weight over a 24-hour period should immediately be given priority on the teats, and pups that lose weight should be very closely monitored and supplemented if needed.

As a general guide, happy well-fed pups will sleep for most of the day. When they wake, they will move about and make noise for a short time until mum licks and cleans them (stimulating them to go to the toilet), and will then head for a feed. After about 15-20 minutes of feeding they will fall asleep again. Puppies that cry are usually cold, hungry, in pain (such as when a bitch lies on a pup), or have been separated from their mother and littermates – so a happy litter is a quiet one. If your pups seem to be constantly crying something is wrong - check to make sure the bitch has sufficient milk and that the whelping box is suitably warm.

You should also check the bitch each day – inspecting and feeling each of her teats to check for heat, lumps or soreness. All bitches producing milk are at risk of developing ‘mastitis’ which is a bacterial infection in the teat itself. The affected teat becomes inflamed and hard, and often feels hotter than the other teats. Mastitis can occur suddenly and can be very serious. The milk from the infected teat is discoloured and thick, and the bitch may go off her food and appear lethargic. If you are concerned that your bitch might be developing mastitis have her checked by a vet immediately.

The bitch should be eating as much good quality food as she can, and drinking plenty of fluids. The food and water bowls should be placed outside the whelping box, so they are easy for the bitch to access. Never place a water bowl inside the whelping box as puppies have been known to drown in them. If she is a good mother, you may have to take her out to the toilet on the lead as she might not want to leave her pups.

If you want to supplement her calcium, now is the time to do it. The liquid form (calcium syrup) is the best way to do this as the bitch is able to absorb more of the calcium from the syrup than from powder. The powder can also make her food ‘gritty’ and she may not eat as well as she needs to as a result.

Although it is an exciting time, and you may have family and friends who want to visit, keep everything quiet and low-key for a few weeks. It can be very stressful for any bitch (but particularly a maiden bitch) to have lots of people looking and touching her pups and this can

lead to her becoming increasingly unsettled – something you want to avoid. Bitches can also get very protective of their pups and may behave aggressively to strangers, especially in the first few weeks, so be careful.

### **Raising your Litter – The First Two Weeks**

During the first two weeks, the pups are totally reliant on their mother for everything. They cannot see or hear fully as their eyes and ears have not yet opened. They are unable to shiver, and so rely on their mother and each other for warmth. They can't even go to the toilet without some stimulation from their mother.

At this stage the biggest risks to survival are cold and hunger. Puppies can dehydrate very quickly as they have no body reserves. They are unable to regulate their own temperature so it is vital that they remain warm and don't 'wander off' from the litter. This is why a whelping box is important as it confines the pups and prevents them from getting away from their littermates.

If a pup becomes chilled, it becomes weak and unable to suckle. If it can't suckle, it becomes dehydrated and its blood sugar levels fall dangerously low. This becomes a vicious cycle and soon the pup becomes weaker and weaker. Early detection and action can easily reverse this spiral, so it is your job to be alert to changes in each pup's behaviour.

If you have a weak pup, the first thing to do is to warm it up. Placing it on a hot water bottle covered with a towel (to prevent burning) is the first step. Whilst you are making the hot water bottle, put the puppy 'under your jumper' against your skin to use your body heat to keep it warm. Once it feels warmer, the next step is to give it some fluids. Using an eye-dropper or a syringe, place a few drops of warm water, (either on its own or mixed with sugar or honey) in the pup's mouth. When you are doing this make sure the pup is held the same way as it would be when it is feeding off the teat – do not hold the pup like a human baby as the fluid will run down the wrong way and could choke the pup.

If the pup seems to perk up, place the pup on one of the bitch's back teats and make sure it has a good feed. Sometimes pups look like they are suckling, but they are not really getting much milk. You will have to supervise this puppy, making sure it stays warm and has a feed every few hours until it looks stronger. If the puppy does not respond to the oral fluids, it may need to go to the vet for some fluids to be administered by injection.

During these first two weeks you will need to be checking the pups often, and keeping the whelping box and the bedding clean. Getting into a routine where each of the pups is gently handled, weighed, and inspected each day is best. The early handling is part of the pup's normal learning process. Even though the pups cannot see or hear fully at this stage, they are able to smell and it is thought that a little mild stress (such as being picked up and handled) at this age is useful in helping them cope with things later on in life.

When the pups have reached two weeks of age it is time to worm them all, along with the bitch. Roundworm is a particular problem in young pups as it is passed through the milk to the pups. It is also cycled through the bitch as she cleans the pups and eats their faeces. At this age it is probably easiest to use a liquid wormer for the pups as getting a tablet into their mouths can be quite difficult. Each pup needs to be weighed and dosed according to its weight on the day of worming. The bitch can be given a regular worming tablet.

## **Raising your Litter – The Third and Fourth Weeks**

From about the 10<sup>th</sup> day of life, the pups' eyes and ears will begin to open. Suddenly they are in a whole new world and they start to explore. Their muscle tone and co-ordination will also be developing and they will start to make their first attempts at walking. By the fourth week the pups are starting to play with each other and the bitch. It is very easy to waste a lot of time just watching them at this age!

The bitch's milk production is at its maximum as the pup's appetite increases. The bitch will probably need to eat more food in these two weeks than at any other time. It is also the time to start introducing solid feed for the pups. Most breeders start with a flat dish of cereal mixed with warm water (or puppy formula), or puppy food that has been soaked in warm water until it is soft and mushy.

When you first introduce the food the pups will usually walk all through it, get it all over themselves before suddenly realising it is for eating. Over a couple of days they will gradually get the idea, and will soon come running when the feed dish is put down. By supplementing the pups with a number of meals per day, it is possible to take some of the pressure off the bitch, especially if she has lost some condition feeding the pups.

Pups at this age spend a lot of the day exploring their world. They will start to escape over the walls of the whelping box and will need to be enclosed in a puppy run. They can also be allowed outside for short periods of time if the weather is fine. This is the age when pups learn what constitutes their bed and what is their toilet. It is important that they are provided with different surfaces so that they instinctively learn to toilet away from their bed.

Puppies also do a lot of exploring with their mouths. They bite and chew each other, the bitch, the bedding and anything else they can get their mouths on. Providing toys of different textures at this age can stimulate this development. It is also possible to encourage chasing behaviour with toys on a rope or string that can be dragged along the ground.

## **Raising your Litter – The Fifth Week Onwards**

As the pups continue to develop, they will become more and more co-ordinated, and their play will start to mature as their characters develop. This period in life is called the 'Socialisation Period'. This is basically the time where they learn all about what is 'normal' in their world. After the socialisation period ends, they will be suspicious of new and novel experiences so it is important to expose them to the things they will experience later in life.

Socialisation is not just about getting them used to other dogs it includes exposure to people, handling, noises, and smells. Pups can be prepared for their racing life by getting them used to being examined and handled, teaching them to walk on a lead, getting them used to travel in the float or car, exposing them to the sounds of the track, they can even be introduced to the starting boxes. You can encourage chasing by playing chasing games. At this age they can have a warm bath (using a puppy-safe shampoo) as long as you make sure they are totally dried off as they are still susceptible to the cold. They can even be introduced to walking on a lead. All of the experiences need to be controlled and made as positive as possible. You do not want a pup to have a bad experience at this time.

The pups will now be on regular meals three or four times a day. You may choose to wean the pups from the bitch, but sudden forced weaning is very stressful for both the bitch and

pups. It is far better to let the bitch gradually wean the pups herself – she will probably start to tell them off when they use their needle like teeth on her teats – but the gradual weaning will allow her milk to dry up naturally, rather than leaving her feeling engorged and uncomfortable, and increasing her risks of developing mastitis.

The food that you feed can gradually change from soft and sloppy food to harder food. Any sudden changes in diet will cause the pups to have loose stools, so make sure new foods are introduced slowly over a couple of days. As the pups get older, they can also be given raw bones to chew on, but make sure the bitch is safely locked away if she is likely to become possessive of bones.

At this age you will be kept busy trying to keep the pups' area clean. You will need to pick up the faeces three or four times a day as puppies' toilet more often than adults. Their bedding will also need changing more often as they are messier.

### **Worming and Vaccination**

Pups are usually wormed at 2, 4, 6 and 8 weeks of age. They need to be weighed and dosed accurately with a product that will kill round- and hook-worms at the minimum. It pays to rotate worm treatments, using different brands (containing different drugs) so that you do not promote resistance to the wormers

At six to eight weeks of age pups are due for their first compulsory vaccination. The vaccination given at this age is generally a C3 – distemper, hepatitis, and parvo-virus – the three killer diseases of puppies. The vaccination takes 10-14 days to be effective, so it is important not to assume that the puppies are protected from these diseases the minute they are given the vaccine.

There is a compulsory C5 vaccination that must be given at 10-16 weeks of age, proof of both will need to accompany the Litter Registration Application.

### **Ear-branding**

All pups will need to be ear-branded at about 8-10 weeks of age. It is up to you as the breeder to make a suitable time with the ear-brander. The ear-brander will come and ear-brand each puppy and fill in the markings and description for each puppy on the Litter Registration form (Form E).

The pups will need to have an ORI Approved Microchip implanted at 10-16 weeks of age by an ORI Approved Implanter. At this age pups can also receive their C5 vaccine.

The Litter Registration Form can then be submitted, along with the correct fee and the evidence of vaccination. You will then receive each pup's application for registration and transfer of ownership applications which should be passed on to each new owner when a pup is sold to allow them to name their pup in the future. The pups can now be sold if that is your wish. If you are going to sell the pups, it is a good idea to start advertising them well before you want them to go. There are a number of free listings, or you can pay to advertise the litter in one of the greyhound publications.



## **Breeders Reminder Checklist**

- Find a Mentor to help guide you
- Find a Veterinarian you are comfortable with
- Select the Bitch you are going to breed with
- Ensure that either you are the owner of the bitch or have an 'Authority to Breed' or Breeding Lease lodged with ORI
- Register the bitch as a Breeding Female
- Ensure your bitch has been DNA tested
- Select a Suitable Sire for your litter
- Contact the Studmaster to arrange the mating
- Check your bitch daily when she is due to come into season
- Make sure the mating is timed well
- Note the expected Whelp date on your calendar
- Provide proper nutrition, exercise and care for your pregnant bitch
- Prepare the Whelping box well in advance
- Watch your bitch for signs of whelping
- Supervise the birth of the puppies
- Contact your vet if complications occur
- Submit your Result of Mating Notification to ORI
- Ensure your pups are kept well fed and warm
- Make sure weaker pups are given opportunities to feed
- Worm and Vaccinate the puppies
- C3 vaccination at 6 – 8 weeks
- Organise a time for the Ear-Brander to come
- Organise to have the pups Microchip implanted
- Organise for the pups to have C5 vaccination between 10 – 16 weeks of age
- Register the Litter with ORI within 4 months of the whelping date

## **Further reading**

*Care of the Racing and Retired Greyhound* (2007) Blythe, Gannon, Craig, Fegan

*ABC's of Dog Breeding* – Claudia Waller Orlandi PhD

*Genetics for Dog Breeders* 2<sup>nd</sup> Ed (2001) by Roy Robinson

*Rules of Greyhound Racing* – National Rules and Local Rules (available online from the Tasracing or ORI websites)

*Recommended Standards for the Care of Greyhounds* - Available from Office of Racing Integrity