

STUD DOG BASICS

A Soup to Nuts Overview of Developing a Leonberger Stud, from Evaluation of the Male through Breeding, With Some Concrete Suggestions for Fostering Productive Breeder/Stud Owner Relationships

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Introduction

One would think that a dog breeding would be simple. Canines have managed to reproduce for millennia with no help from humans. It turns out, though, that a planned breeding of two particular Leonbergers is an intricate dance performed in a narrow, inherently unpredictable, window of time. The process often involves six participants --- the bitch, the stud, their two owners and two reproductive vets --- some of which might be thousands of miles apart. Evaluating the merits of a proposed match and maximizing the chances of a successful breeding require knowledge, candor, timely communication and trust on the part of both the breeder and the stud owner, who often do not know each other very well, if at all. Foremost, this article is a stab at providing basic information for aspiring or inexperienced stud owners. Secondly, it addresses the relationship between breeders and stud owners, offering some concrete suggestions as to how they might best work cooperatively as a team to accomplish what both very much hope to achieve: a big batch of healthy, happy pups that will bring joy to their owners for many years to come!

Please do note that this article is an **overview**. Books have been written about topics here addressed in just a few sentences or paragraphs. If parts of what is said seem obvious, we do not mean to insult anyone's intelligence or knowledge base. We learn something new from almost every breeding of one of our boys; and we don't expect the learning curve to stop any time soon. Our aim is simply to answer questions that we often field and to compile in one place some foundational information that we wish we had known before we unexpectedly found ourselves with a young stud in demand and had to learn a lot in a hurry.

I. Preliminary Evaluation of Your Boy for Stud Potential and Some Practical Realities of Placing and Maintaining a Boy at Stud

Every Leo is remarkable in one or more of many ways. Versatility is a hallmark of our breed. We have healers, cuddlers, herders, sniffers, carters, pullers, runners, jumpers, swimmers, and on and on and on. Specific aptitudes aside, virtually every Leo takes our hearts by storm, demanding devotion that is returned in spades. Little surprise, then, that most of us consider our dog the most beautiful and wonderful Leo in the world; and there are few of us that would not like to see our own boy's unique traits passed down to future generations. When it comes to breeding, though, we must take off our "Leo Goggles" to objectively evaluate a potential stud and honestly appraise some practical implications of placing a dog at stud.

A. Preliminary Evaluation of Stud Potential: Temperament; Breed Type; Conformation; Registration; and Semen Viability

So, you find yourself with a promising male Leo on your hands. Maybe you acquired your boy as a show/stud prospect that seems to be panning out. Perhaps --- like us many years ago --- all you wanted was a pet but you go to the LCA National or some other event and a breeder compliments your boy and suggests that you consider placing him at stud. That's pretty exciting, and you have some interest in pursuing it. Where do you go from there? You could jump straight to expensive health testing and entering your dog in conformation shows. But it is far more practicable to start with some preliminary evaluation of your boy. If you don't have extensive knowledge of Leonberger conformation, a good place to begin is the Leonberger breed standard. We recommend purchasing the "Leonberger Illustrated Breed

Standard”, published by the Leonberger Club of America [“LCA”] --- the AKC parent club for the breed --- which supplements a narrative break-down of the standard with instructive images.

The first substantive paragraph of any breed standard is the most important. That paragraph of the AKC Leo standard reads as follows:

General Appearance: The Leonberger is a large, sociable working dog, muscular yet elegant, with a proud head carriage. The breed is distinguished by its black mask, substantial bone, balanced build, and double coat. Adult males are particularly powerful and strong and carry a lion-like mane on the neck and chest. Bitches are unmistakably feminine. The Leonberger is a dimorphic breed; a dog or a bitch is easily discernible as such. Although imposing in size, the Leonberger is graceful in motion. Natural appearance is essential to Leonberger type. The breed is to be shown with no trimming, sculpting or other alterations. True to the breed’s origins as a multipurpose family, farm and draft dog, today’s Leonberger excels as a versatile working dog and devoted family companion. Intelligent and lively, friendly yet vigilant, the Leonberger is attentive and self-assured in all situations.

The standard then goes on to describe, in separate sections: the proper size and proportion of height to length of body; head; neck, topline and body; forequarters; hindquarters; coat; color; gait; and temperament.

For the preliminary evaluation of your boy you are interested in his temperament, breed “type”, conformation, and the viability of his sperm.

1. Temperament: Temperament is often the easiest element to evaluate. If your boy is confident in stressful situations and interacts well with people and other dogs in varied environments, he likely has a typical Leo temperament. Barring temporary acute health issues or extraordinary circumstances, no Leo exhibiting human aggression should ever be bred. Aggression toward other dogs is a bit more complicated. If your boy is frequently aggressive toward bitches or neutered males, his temperament is probably not optimal for breeding. But if your boy is a year or older and sometimes growls at unneutered males, particularly large males or other Leos, that does not necessarily mean that he has a bad temperament. It does mean that he should undergo further evaluation to determine whether he just has a high sex-drive, which is not a bad trait in a stud dog.

2. Breed Type: Aside from temperament, Leonberger breed “type” is the single most important attribute a stud dog can have, yet also the most difficult to define. The “type” of the dog certainly involves specific conformation traits. But breed type is more than just the sum of the dog’s parts and angles. A dog has good type if it looks and acts like the Leonberger that the breed standard describes. But what exactly does that mean? A European judge at one of the LCA National specialties put it about as well as we have ever heard it said. His comment was that we should always ask of any dog being considered for breeding: “If you see the dog from a hundred yards away, do you immediately know it is a Leonberger?”. If you don’t, then the dog does not have ideal type.

Put another way, Leonberger type is the collection of qualities that unmistakably identifies the dog as a Leonberger and distinguishes it from other breeds. **If we lose type, then, in a fundamentally important way, we have lost the breed.** There are dogs with significant conformation faults that you still know at a passing glance are unquestionably Leonbergers. And there are dogs that stack up well on a line item comparison to the breed standard that you might not immediately recognize from a distance as a Leonberger. Most obviously, the Leo is distinguished from other breeds by size, mask, bone, proportion, properties of the head, graceful movement, confident manner and, in the case of males, a mane. In the end, though, breed “type” really comes down to “I know it when I see it.” In determining type, the aid of experienced eyes is invaluable. For additional insight on type you might check out the FCI Leo breed standard <https://www.fci.be/Nomenclature/Standards/145g02-en.pdf>. The FCI standard is utilized by most other countries and differs somewhat from the AKC standard. Familiarity with the FCI standard aids the effort to keep Leo type consistent around the world.

3. Conformation: If “type” refers to the overall “Leonesse” of the dog, his conformation traits are much more specific. It is far beyond the scope of this article to discuss everything that goes into good Leonberger conformation. The breed standard describes not only the features that are desirable in the ideal Leo, it also specifically addresses some faults and lays out some disqualifications. In deciding whether a boy is good breeding stock, one should consider not just the merits of the boy but also his weaknesses, giving due attention to major faults and disqualifications specified in the standard. These are traits that we do not want to perpetuate. If this is your first venture into breed standards, you will probably not understand some of the terminology in the standard, much less be able to objectively apply the standard in evaluating your own dog, so you are probably going to need some help.

You might start with your boy’s breeder, who will know the characteristics of the boy’s pedigree lines and had the advantage of examining your boy in that magic period of 7 ½ to 9 weeks old, when you can get a glimpse of what a pup might look like several years down the road when he is finally starting to mature. You might also ask some other experienced Leo folk to go over your boy informally and give their impressions. Although evaluators will invariably notice different things, some common observations should emerge that indicate the greatest strengths and weaknesses of your dog’s conformation.

Some more formal ways to get a read on the conformation of your boy include:

- **BACL:** The LCA has a program in which certified LCA members will conduct an evaluation called a “Breeding Acceptability Check List”. Although the BACL program predates AKC recognition and is no longer determinative of whether your boy can be bred, a BACL remains a very helpful way of learning both about how a dog is evaluated and about the attributes of your boy. The process is straightforward and unthreatening. One or more of the LCA’s BACL evaluators go over your dog and fill out a form that covers everything from temperament to conformation to movement. This program is an underutilized resource, especially for those that are getting started in the breed. You can learn a lot about Leonberger conformation and your boy simply by listening to what the examiners have to say.
- **CCA:** The LCA has recently created a Certificate of Conformation Assessment program, more details of which are available on the LCA webpage. The dog is evaluated in detail in writing and scored by three highly qualified evaluators in a relatively informal setting. A qualifying score will yield a “Certificate of Conformation Assessment” title recognized by the LCA and the AKC. The educational opportunities provided by the CAA program are quite comparable to those afforded by the BACL program.
- **LCA National Traditional Show:** This is a form of conformation show in which a judge that is expert in the breed goes over your dog in great detail and completes a written evaluation that hits the highlights of temperament, type, conformation and movement. These events, that you will only find at the LCA National or shows hosted by LCA affiliated regional breed clubs, are a bit more formal than a BACL, and require some basic knowledge of conformation handling, but are less intimidating and handler-driven than the AKC conformation ring. If you listen very carefully you can often catch what the judge has to say when she/he is dictating notes (eavesdropping at such shows is not frowned upon and should be expected). You will learn a lot about your dog at one of these shows, and the written evaluation is something you can review over time as you learn more about conformation and as your boy matures.

However you go about evaluating the conformation of your boy, you should listen to what people have to say. If you want an honest opinion of your dog --- and, if you are considering breeding your boy, you should --- take off your Leo Goggles and pay attention to the bad along with the good. There is no such a thing as the ideal dog described in the standard. Every dog has faults. In a breeding, you hope to avoid “doubling up” on conformation faults shared by bitch and stud; and you cannot do that without knowing the faults of your own dog. If you don’t want to hear anything negative about your boy, then breeding might not be your thing. Keep in mind, too, that Leos grow in wonky ways. Virtually all of them go through some gangly, ugly stages as they grow, and most males will not truly come into their

own until they are four years old. Any evaluation done prior to eighteen months old will be subject to change except as to obvious strengths or weaknesses unlikely to be affected by maturation.

4. Registration: Not all AKC registrations are created equal. There is a “full” registration and a “limited” registration. Dogs with limited registrations are not permitted to enter AKC conformation shows and none of their offspring can be registered. Before you get too far along in qualifying your boy as a stud, make sure he has a full registration or that his breeder will entertain lifting the restriction, and on what conditions. The AKC will quickly remove the restriction at the request of the breeder.

5. Breeding viability: If your dog has a full registration and good temperament, type and conformation, he is a candidate for service at stud. You could start doing some or all of those things that are addressed in sections II and III of this article but it makes sense first to determine whether your dog is likely to be “viable”. Does he produce sperm that is capable of fertilizing eggs? Your boy should be sexually mature by about 18 months old. That gives you an opportunity to take a look at his sperm before the two-year minimum breeding age established by the LCA breeding standards in the LCA Member Practices.

(a) What to expect at the first “collection” of your boy: How do you go about getting a semen evaluation? Find a specialized canine reproductive vet. Later in this article we will see that, should you move forward with offering your dog at stud, the choice of reproductive vet will involve considerations beyond mere competency to evaluate sperm. But to see if your dog has viable sperm, any repro specialist should be adequate. Ideas for finding one are covered later. When you call the vet’s office tell them that you are inexperienced but have a boy that you are considering breeding, that you want a semen analysis, and that you might want to freeze the semen should it prove promising. The vet might ask if you will have or need a “teaser bitch”, which is a girl in heat. If you have access to one, all the better. If you don’t, the vet might have a bitch on hand that can be used as a teaser. Any breed will do for a teaser. If no teaser is available, don’t worry about it. You are looking for a baseline evaluation of sperm. You can assume that the sperm analysis would only get better in the presence of a bitch in heat. In the absence of a teaser the repro vet will likely have a refrigerated cotton swab infused with estrus from a bitch in heat that they can dangle in front of your boy during the sperm collection. Before the appointment get your boy used to having his testicles and prepuce (penile sheath) handled, so it will not be an unfamiliar sensation at the visit.

What will happen when you go to the vet’s office for the evaluation? Make sure you bring with you all identifying information for your dog --- AKC registration number, date of birth, microchip number, etc. Get there early enough for your boy to sniff around wherever he wants for a while before you go in. There is a good chance that the ground around a repro vet’s office will have enticing smells of girls in heat that will get your boy excited before the appointment, which is what you want. It’s the next best thing to having a teaser bitch.

The repro vet will probably first examine your dog’s prepuce and testicles, checking the latter for size, firmness and any obvious abnormalities. The vet will then collect the boy. If there is a teaser bitch, someone other than the vet will hold the girl in front of the boy, someone else (probably you) will hold your boy’s head/neck and the vet will be positioned beside the dog. The vet will likely encourage you to get the boy excited by saying things like “Get the girl, Get the girl!”. The vet will proceed to manually stimulate the boy to ejaculation, catching the semen in a plastic collection bag. As the boy gets erect, the prepuce will withdraw all the way back from the penis, the dog will probably try to lift one of his rear legs (which, as we will see later, he would do in a live breeding in order to turn around and get butt to butt with the girl in a tie). The vet will then probably extend the penis of the dog directly backwards between his rear legs and milk it for awhile to get the bulk of the semen, simulating what would happen in a natural breeding. How long it takes the boy to ejaculate is some indication of his libido, which is often evaluated on the semen report. The faster the better as far as libido is concerned. If there is no teaser bitch, the process is the same except that someone will hold the estrus swab in front of the dog’s nose in place of the teaser bitch.

(PRO TIP: If you have never seen an erect, unsheathed Leo penis, you will probably be quite surprised by just how large it actually is. The little pink bit that peaks out when a boy is excited or licking himself is only the tip of the iceberg. The actual erect penis is very much larger. Don't look shocked the first time you see one. That's a newbie reaction, and by the time you've finished reading this, you will be way too educated to get the bigeye at your first glimpse of what your boy has been hiding from you. Just give yourself a secret high-five that your boy really is all that.)

Pretty much as soon as the collection is over, the vet will take the plastic bag with a tablespoon or so of semen to another room for evaluation of the sperm. The vet might instruct you to “get your dog back together”. What they mean by this is for you to keep an eye on your dog's penis as it becomes flaccid and retracts back into the sheath. That process can happen in a minute or less or might take as much as twenty minutes. The dog will usually manage this himself, licking his penis to encourage it back into its sheath. What you want to make sure of is that, as the boy's penis goes down, the hair on the prepuce does not catch on the penis causing the prepuce to invert and get sucked back in on itself as the penis retracts. We have never seen this happen, but apparently it can. If it does you need to adjust it. Once your boy is back “together”, you might ask the vet to see the semen under the microscope.

(b) Semen basics: concentration; motility; and morphology: In evaluating semen, the vet is looking at three factors: concentration of sperm; motility; and morphology. Concentration is the simplest of the three: how many sperm are there and what is the concentration of sperm in the seminal fluid collected. There are three discrete portions or “fractions” to dog ejaculate. The “presperm fraction” originates in the prostate and is believed to clear the urethra of contaminants such as urine and bacteria. The “sperm rich fraction” comes from the testicles and contains the sperm. Both these fractions are secreted very quickly. The third fraction is more clear prostatic fluid believed to lubricate the sperm's swim to the uterus, and it is this fraction that is normally milked out of the boy's penis by contraction of the vaginal walls during a tie in a natural mating. When your boy is collected, there is really no point milking the penis for any extended time, as the sperm will not be swimming to any uterus. The vet wants the second portion.

How much sperm should you expect? This can vary widely from dog to dog, and ranges from none to four billion or so. But far less than billions will suffice, depending upon motility and morphology. “Motility” measures how many of the total sperm move, and sperm reports will typically reflect how fast they are moving. “Progressive motility” indicates the ability to swim in a straight line. Sperm that swim in circles are obviously far less likely to get the job done than the ones that swim in a straight line. “Morphology” addresses how well the sperm are formed. Every dog will have some malformed sperm, described by exotic terms such as “bent midpieces”, “distal droplets” and “acrosomal heads”. The first collection of the boy might have more abnormal sperm than would a second collection several days or a week thereafter, but this this should not affect the bottom-line number of progressively motile, well-formed sperm. As a baseline figure, three hundred million progressively motile sperm with normal morphology should be ample for a natural breeding or a breeding using shipped chilled semen. For a shipped breeding using frozen sperm, add another fifty million or so to account for degradation incident to the freezing process. The vet will also examine the semen for the presence of blood or bacteria that might indicate infection affecting the sperm.

The vet should give you a semen report detailing the concentration, motility and morphology. Even an excellent report does not necessarily mean that your dog is fertile. A small percentage of dogs that have semen that looks great on paper just can't produce. Likewise, there are rare dogs with objectively poor semen reports that get bitches pregnant every time. That is why, all other things being equal, breeders will often opt for a stud that is “proven”, i.e. known to be able to produce pups.

If the semen is good, congratulations! That is a big moment in the evolution of a stud dog. Freeze it. You can always destroy the semen if the dog does not pan out in conformation or health. The sperm from a young dog will often best withstand the freezing process, even if the concentration and overall numbers might improve until the boy is three or so. Don't make the mistake of freezing your boy only when you think his vitality might be waning. If you

freeze the sperm when he is young, it will be available to the gene pool, whether or not you decide to pursue natural stud service.

B. Eyes Wide Open: Some Practical Realities of Placing and Maintaining a Male at Stud

If preliminary evaluation of your boy indicates good temperament, type, conformation and viable sperm, what should you think about next? It is probably a good idea to honestly consider whether having a stud dog makes sense for you and your family. There are several factors you should weigh.

1. The breeders, not the stud owner, always control whether a stud is ever used, and it may never happen.

As will appear, a hopeful stud owner can go to a lot of trouble and expense, and make some lifestyle accommodations, only to never see their dog used at stud. We have entertained many calls from stud owners that have done everything right. They have championed their dogs in the conformation ring, done all the health testing, participated in the community and educated themselves about breeding. Their handsome boy hits two years old, gets his CHIC number and they are ready to rock and roll, to get their boy that first breeding. They excitedly ask: How do I get breedings? On one level, we love to hear this question, because our breed needs as many studs as it can get. On another level, we dread this question, because there is simply no guarantee that the boy will ever be used. Although we will shortly discuss things you can do to maximize the odds, it may just never happen and that can be disheartening.

The relationship between a breeder and stud owner is not power-neutral. It is always the breeder that ultimately decides whether he/she will use your boy or a different stud. And, while it is certainly an honor to have a boy considered for stud, breeders should always remember that the stud dog owner is heavily invested, financially and emotionally, in his/her boy. So, for any breeders reading this, please don't treat sperm as though it were simply a genetic commodity, however true that might be. If you choose the stud of a good owner, he/she will go to great lengths to get your girl pregnant, often on short notice and at great inconvenience. Treating the stud owner as a partner in the breeding goes a long way toward a productive working relationship.

2. Placing your dog at stud is almost never profitable. Sure, breeding your boy might every now and then result in a nice check, probably equivalent to sale price of a puppy from any litter produced, and that money is nice to have. But the total proceeds for breedings will rarely even come close to the overall investment of time, effort and money you have put into qualifying and promoting your boy. If you decide to offer your boy for stud, you should do it with eyes wide open, knowing in advance that it will be more a labor of love for your boy and the breed than a money-maker.

3. The high drive males that make the best natural breeders are also the dogs that create the most management challenges; and maintaining a high libido boy at stud may not match your family circumstances or your goals for your dog. We personally believe that there is too much emphasis on natural breedings. Is it the best way? Absolutely. Do we want to be sure that we continue to have studs that are capable of breeding naturally? Certainly. Is there any more satisfying way to accomplish a breeding? No. But does it really matter as to how many pups you get? Not necessarily. If your boy produces high quality sperm, you nail the timing, and you have good repro vets on both ends, you can ship chilled semen with little impact on litter size, which is largely controlled by the number of fertile eggs that the bitch produces.

All that said, most breeders want natural breedings, and the studs that make the best natural breeders are the high sex-drive males. If you go to a National and see lurking males hanging around the edges of the action, closely watched by their owners, and generally kept somewhat segregated from other dogs, there is a good reason for that. Those boys want the girls in heat; and they are more than willing to fight other boys for the opportunity to breed those girls. That is true for dogs that have wonderful gentle, temperaments in everyday life. Put them around unneutered males and girls in heat and that dynamic changes. No one should be surprised by this. These are animals. Just spend an hour watching "Fight Night" on the discovery channel to see what the drive to reproduce does to males. Male rams knock heads at twenty miles per hour. Bull bison gore each other. Normally calm elephants can become insanely aggressive and

destructive in musk. A male Hippo would rip his own brother from the google to the zotch for the privilege of mounting that beautiful bronzy gal that rolls her hips just so as she undulates across the river bottom. High libido does not indicate bad temperament. Most of the males that might be growly at an LCA National are wonderful companions and ambassadors of the breed in everyday life.

If what you most want to do with your dog are activities that involve a lot of close interaction with other intact large male dogs, you might be better off with a boy that is neutered at two years old (please **never** neuter before 18 months, no matter what your vet says --- Leos need the hormones to close their growth plates and develop muscle adequate to support their frames). If you have intact girls in your home, your intact boy is likely to be nuts for several weeks twice a year unless he is kenneled during times in which a girl is in estrus. If you have another intact male, you will have to watch your boys to make sure they do not fight, and it will be very important that they understand that you, and not either of them, are the alpha dog in the household. We don't mean to suggest that all of this cannot be managed, or even that the management is terribly onerous. It is not. Our studs have all been good buddies, and regularly curl up next to each other on one dog bed. We have only ever had one serious fight, which was over in less than a minute and ended up with both boys joyously running the mountain together and later happily standing shoulder to shoulder at the vet's office to get their staples. But we are careful to set our boys up to succeed in getting along. When we choose a new puppy, our first objective is to maintain harmony in our household. We prioritize a puppy personality that we believe will complement that of our other boy/s. We feed our boys in separate areas. When they have been apart for a long period of time and might be growly were we to let them together immediately, we keep them separate for a while, and bring the one that was inside the house out, and the one that was outside the house in, before putting them together. When we go to dog shows or Leo events, we are especially careful to avoid close interaction with other breeding males and to avert eye contact between our boys and adolescent males that might be feeling their oats. It's all perfectly doable, but it does take some effort and vigilance. These are the kind of things you should consider if you are thinking of keeping your boy intact for use at stud, particularly if it appears that your boy will turn out to be a high drive male.

4. If your boy does get a breeding, you need to have a schedule that is flexible enough to accommodate a breeding at the optimal time on short notice. As will be seen later, when the time is right for a breeding, it's right, and it **has** to happen over a period of several days. Precisely when that several days occurs is inherently unpredictable. You can never know for sure when a bitch will come into heat. Even girls with predictable cycles may vary by a month or more depending on any number of circumstances. And once the cycle has started, it's hard to accurately predict exactly when the optimal time for breeding will be. A good average might be about ten to twelve days from the start of the heat cycle, if the bitch does not stall in her cycle or go into estrus more quickly than expected. All this means that a stud owner must be flexible enough to assure that the boy can be available without a lot of advance warning, no matter how unsuitable it might be. Good breeders put a huge amount of planning, time and money into a breeding and they deserve to have their girls bred at the optimal time. If that will be a problem, then you should consider limiting your breeding activity to shipping frozen sperm.

II. Moving Forward In Qualifying Your Boy for Breeding: Record Keeping and Health Testing

If the preliminary evaluation checks out and having an intact male will suit your household and family circumstances, what should you do next? Start organizing your records and do your health testing.

A. Record Keeping

The path to qualifying a stud and getting him visible to breeders will end up littered with paper. It is helpful to have a good system for organizing and keeping track of records for your boy. Anything that works for you will do. We keep a simple loose-leaf notebook for each of our boys that includes identifying information, registration papers, pedigree, semen analyses, health testing results, DNA number, championship certificates, contracts with breeders, contact

information for owners of pups from the breedings of the boy, etc. The notebook is a handy reference tool for all things related to that particular dog and would be quite helpful in the exceedingly unlikely event that the AKC were ever to unexpectedly show up at our door to audit our records.

B. Health Testing

Regrettably, the AKC requires no health testing whatsoever to breed a bitch and register her litter. But just because something is permitted does not mean it should be done. The LCA admirably requires health testing and disclosure of results for dogs used by its members for breeding. If you've never health tested a dog before, the process can seem a bit daunting. We will lay it out in some detail to make it as easy as possible to get through it.

1. LCA Member Practices: The LCA Member Practices, which is published on the LCA webpage, sets forth some mandatory breeding requirements for LCA members. There are currently three health related criteria that must be satisfied prior to breeding. The stud must: (i) have a CHIC number; (ii) have passing hip scores; and (iii) be clear of LPN 2. We will shortly discuss the mechanics of testing and submitting results, but before we do that, it is helpful to understand what CHIC is and how you go about getting a CHIC number.

2. The CHIC Database and the OFA: "CHIC" is an acronym for Canine Information Health Center. CHIC used to be an independent organization but is now operated by the Orthopedic Foundation for Animals ["OFA"], which is an arm of the AKC that performs hip x-ray evaluations and records the results of various health tests. The CHIC webpage is here: <https://www.ofa.org/about/chic-program#brdreqs.html?breed=CLS>. CHIC is a public repository for health testing results of breeds whose parent clubs have agreed to participate in the program. Each breed in the CHIC database has listed health tests that are required or recommended by the parent club for the breed. The Board of the LCA annually updates tests that are required or recommended in order to get a CHIC number. The required and recommended testing for the Leonberger in any given year is found here <https://www.ofa.org/recommended-tests?breed=LB>.

Your dog will automatically receive a CHIC number if you have performed all the health testing required and have authorized disclosure of the results on the CHIC database. Note that having a CHIC number does *not* mean that your dog has passed all the required testing, merely that the testing has been done and the results made public. CHIC is about transparency, not perfect results. To get a CHIC number you must submit testing results to the OFA. You can report the results one by one as you obtain them or submit them all at once. The application forms for all testing recognized by OFA can be found here <https://www.ofa.org/application-forms>. Here is what the OFA/CHIC records look like for a deceased stud of ours: <https://www.ofa.org/advanced-search?f=sr&appnum=1300049>. You can get a lot of information from these records when you are checking out a bitch as a potential mate for your boy.

3. Testing currently required and recommended to obtain a CHIC number and how best to get it done: We will take these in the order that is most cost-effective:

(a) Genetic tests done by University of Minnesota, LPN1, LPN2, LPPN3 and LEMP: The University of Minnesota has done fine work to isolate these genetic neurological disorders specific to the Leonberger. These tests are a good place to start with your health testing because all three can be performed with one blood draw from your usual vet that is then shipped to the University of Minnesota. Information about such testing is found here <https://vetmed.umn.edu/research/labs/canine-genetics-lab/genetic-testing/leonberger-polyneuropathy>. For reasons too complex to go into here, the only one of these tests for which a "clear" result is required by the Member Practices is LPN2. A result of "carrier" for LPN1, LPPN3 or LEMP does not foreclose breeding your boy, and Minnesota does not recommend excluding carriers from the gene pool. But if your boy is a carrier for LPN1, LPPN3 or LEMP you will want to be sure that you only breed to girls that test "clear" of these disorders. That is how we rid the Leo gene pool of these issues. As with all these tests, when you have the results back from Minnesota you can submit them to the OFA if you did not already agree to do so on the form that you submitted when the blood was shipped to Minnesota. Caveat as to timing of this testing: We put these tests first on the list both because they are

relatively inexpensive and because they are potentially disqualifying for use at stud. That said, if both parents of your boy have tested “clear” for these disorders, your boy will be clear of them as well. While the tests will still need to be done to get a CHIC number, if your boy is clear by parentage you can push them to the back of the line in case other tests foreclose use of your boy at stud.

(b) Thyroid: This is currently a required CHIC test, but your boy need not be devoid of thyroid issues in order to breed under the LCA member practices. Have your usual vet take blood that can be shipped to one of the specific labs approved by OFA for this purpose. **Make sure your vet understands that only these labs can be used.** The requisite form that you should fill out in advance of the blood draw, which lists the approved labs, is found on the OFA website here <https://www.ofa.org/application-forms>. Because some thyroid issues occur later in life, thyroid testing should be repeated several times over the life of a stud.

(c) CAER [formerly CERF] eye related testing: CAER is the Companion Animal Eye Registry operated by the AKC. This program tests for various disorders relating to the eye. It is testing that is currently required by LCA to obtain a chic number. It is not required that the dog come up clear for all disorders tested, but some eye-associated issues should be carefully weighed for any breeding dog. Glaucoma, for instance, can be extremely painful and lead to blindness. Because the CAER testing is done by a canine ophthalmologist it can be very expensive to test your boy individually. Check out nearby dog shows to see whether they are having a CAER clinic or keep your eye out for private CAER clinics hosted by breeders of any breed, and you may be able to save a lot of money on this test. Unlike any other test on this list, a CAER certification is only valid for one year. You should therefore plan to do it within a year of when you hope to get the CHIC number. Once you have a CHIC number, it will not expire just because the CAER certificate has expired, but it is nonetheless a test that should be done periodically for studs, since some eye disorders only express as a dog matures and ages. The forms for CAER testing will be provided by the vet that does the examination.

(d) Heart: Heart testing is as of this time an optional but recommended test for obtaining a CHIC number. Like CAER testing, heart testing requires a specialist, a canine cardiologist. There are two sorts of heart testing available: the standard test, performed with a special stethoscope; or an echocardiogram. Most Leos only have the standard test, but an echo is a lot better and recommended because it will reveal heart issues that might not be possible to find just by listening. It is also much more expensive. Just as with CAER, look for clinics to get the heart testing done much cheaper. If you really want an echocardiogram, you might contact some breeders in your area who might know of an annual clinic that you could glom onto. The forms for cardiac testing will typically be provided by the vet doing the testing, but can be found here <https://www.ofa.org/application-forms>.

(e) Hips and elbows: These are required CHIC tests that are done together. The LCA member practices require a passing hip score to be eligible for breeding. Unlike all of the other testing here discussed, hip and elbow testing that will count towards getting a CHIC number cannot be done before the boy is two years of age (though non-official “preliminary testing” can be done before the age of two, it will have to be repeated later and this testing is not cheap). Both hip and elbow testing require ex-rays. Hip testing can be done in either of two ways. You can find a vet to take x-rays of the hips for evaluation by OFA certified radiologists. Such x-rays, which involve substantial flexion of the hip joints, are usually done under sedation, but not general anesthesia. There is an art to taking good OFA hip ex-rays. Great precision of placement is required in such x-rays and they should be performed by vets that have a lot of experience taking them. A passing OFA hip score is “fair” or better. The forms for OFA hip testing can be found here <https://www.ofa.org/application-forms>. Some are critical of OFA hip evaluations on the ground that the results are subjective, and sometimes seem to depend on what the OFA radiologists had for breakfast. There is a more objective hip protocol developed by the University of Pennsylvania, known as “PennHip”. PennHip testing requires general anesthesia. The dog will be positioned with an apparatus that that fixes the hip joint in a specific position and measures the degree of separation between the ball and socket of the joint. For PennHip testing, the score that is considered passing for purposes of the LCA member practices is 0.47 or lower for each hip. For more information

about PennHipp and how to find a vet certified to perform the exam look here

<https://antechimagingservices.com/antechweb/pennhip> The submission form is here

<https://cdn2.hubspot.net/hubfs/532826/PDFs/Pennhip-Submission-Form.pdf?t=1498861922516>.

(f) DNA profiling: This is not a health test per se and is not required for a CHIC number or required by the LCA member practices. It is, however, required by the AKC for any stud that has seven litters or more. It is a simple inexpensive cheek swab test that can be done at home and mailed in. You can buy the kit here https://shop.akc.org/products/akc-dna-test?utm_medium=cpc&utm_source=shop&utm_campaign=20191028_shp_professional_products&utm_term=20191028_professional_products&gclid=CjwKCAiAzJLzBRAZEiwAmZb0alcda5UiWzVjnV8GyYIN2gVHjyYGNHhn_IFaOMbfWQHhVGp4TslRihoCZ0EQAvD_BwE. We have all our boys DNA profiled, whether or not we expect them to sire seven litters. If the boy were lost or stolen, his DNA profile could definitively establish that he is our dog, and DNA profiling helps keep the registry pure. The AKC sometimes checks DNA records when litters are registered, and we have known a few cases where AKC has informed a breeder that the registrations do not match the DNA of the supposed parents. It's good to be able to know for sure that your boy's get is really his and that the registry is policed for accuracy of pedigrees.

If your dog passes the test for hips, is clear of LPN2, and obtains a CHIC number, then he meets the health requirements to breed under the LCA member practices. Please keep in mind, though, that there is much more to a healthy breeding than issues for which objective testing is available. It is beyond awesome that we now have genetic tests for diseases such as LPN, so that we can set about eradicating that horrific disease. That said, if we're not careful, the availability of objective testing can all too easily lead to a mindset that a dog that passes all those tests is a healthy dog that will have healthy pups. That is not the right mind set. We currently have no genetic testing for cancers like hemangiosarcoma or osteosarcoma, which are far and away the greatest killers of our breed. If those cancers are prevalent in the pedigree of your boy, you might want to breed to lines that are less affected by those issues. Likewise, if your dog has allergies or stomach issues that affect his everyday life, you do not want to double up those issues by breeding to a girl with the same proclivities. No line is perfectly healthy. If we stop breeding to any line that has an issue, there won't be any Leos left. But we can choose breedings that minimize the chances of perpetuating known issues with the dogs to be bred or the lines they come from.

III. Advance Preparation: Breeding Basics; Finding a Good Repro Vet; and Understanding Pedigrees and Measures of Genetic Relatedness

If your boy has sound temperament, good type and conformation, viable sperm and has passed his health tests, congratulations! Your boy is ready to be offered at stud. But you, the stud owner, still have just a bit of work to do before you offer the boy. At this point, you are probably saying to yourself something like: "ARE YOU F---ING KIDDING ME? I'VE DONE ALL OF THIS AND I'M STILL NOT READY IF SOMEONE ASKS ME FOR A BREEDING?" Not quite, but you are getting very close. There are only a few more things you need to do to be prepared when a breeder inquires about using your boy. You need to have some understanding of the modes of breeding and proper timing of a breeding. You must find a good repro vet. And you should learn the rudiments of pedigree and two measures of genetic relatedness.

A. Breeding Basics: Modes of Insemination; the Reproductive Cycle of the Bitch; and Proper Timing of a Breeding

In an ideal world a breeding would be planned out at least several months in advance of the earliest time at which the bitch might come into heat, giving you time before the breeding to find a good repro vet and educate yourself a bit about the reproductive cycle. But, alas, we do not live in an ideal world. Breeders are human too and it is often very difficult for them to choose a stud. Every breeder would love to have the perfect mate for their beautiful girl, and they

put a lot of effort into finding that boy. But in the real world, the perfect stud does not exist. So sometimes the breeder's stud choice is delayed longer than it should be. And then the girl might come into heat early. And suddenly everything must happen very quickly. If that occurs, you don't want to lose the opportunity to prove or breed your boy just because you don't have a good repro vet lined up or because you cannot speak knowledgeably about how to accomplish the breeding at just the right time. If you have done what is discussed in this section, the breeder might be impressed enough to make the difference in whether they use your boy or another. Trust is critical to a productive breeder/stud owner relationship and demonstrable effort and knowledge instill trust.

1. Getting the sperm in the bitch: modes of Insemination: There are four means of getting the semen from the boy into the girl: natural breeding; vaginal artificial insemination; surgical insemination; and endoscopic transcervical insemination. Certain details of how to accomplish each sort of breeding will be discussed in more detail later. For purposes of being able to talk intelligently with breeders, it is enough to understand the basics of each mode.

(a) Natural breeding, often referred to as "live cover": This one is obvious. When it all works, the stud mounts and penetrates the bitch, the knot at the base the stud's penis swells and locks into the bitch's vagina, the boy flips one rear leg over the girl's rump and turns around so that the pair is butt-to-to butt in a "tie". The tie can last anywhere from a few minutes to forty-five minutes, during which time the girl's vaginal walls contract around the male's penis, milking the semen out of the boy.

(b) Vaginal artificial insemination: Here the semen is collected from the stud in the manner described earlier. The semen is then placed inside the girl via a flexible plastic tube that stops short of the cervix, and the sperm swim the rest of the way into the uterus to the eggs. This sort of AI is sometimes done with the bitch's rear propped up in an elevated position, presumably to give the sperm the advantage of gravity in their sprint to the eggs.

(c) Surgical artificial insemination: The bitch is anesthetized, and the semen is surgically deposited in the uterus through a small abdominal incision. Because very little sperm swimming is required, this is a good option for questionable or frozen semen.

(d) TCI -- Endoscopic transcervical Insemination: The semen is deposited directly into the uterus in an endoscopic procedure, requiring no anesthesia or sedation. The endoscope has a camera and the vet uses a monitor to thread the scope through the vagina and the cervix, into the uterus, at which point semen is deposited into the uterus through the endoscope tube. This is a very good option, provided that the vet doing the procedure is experienced and skillful. It is not a procedure in which you want a vet learning on the bitch being bred.

2. The reproductive cycle of the bitch --- hormones, hormones and more hormones: The reproductive cycle of a canine bitch significantly differs from that of a human woman. A bitch goes through the human equivalents of puberty, fertility/egg production and menopause in every heat cycle, and those cycles continue for pretty much the entire life of the bitch. Menstruation and fertility are controlled by the serial release of different hormones at various times in the reproductive cycle. The Bitch has two ovaries that will produce the eggs. The eggs are contained within follicles that grow toward the surface of the ovary. The Follicle Stimulating Hormone ["FSH"] stimulates the ovarian follicle, causing eggs to grow, which in turn triggers the production of estrogen in the follicle. The rise in estrogen tells the pituitary gland to stop producing FSH and to start making Luteinizing Hormone ["LH"]. The shift to LH -- the LH "surge" -- causes ovulation, the release of the egg from the ovary. When the egg is released the empty follicle turns into a temporary gland called the corpus luteum that secretes progesterone, a steroidal hormone that causes the uterine lining to thicken to accept a fertilized egg and prohibits muscle contractions in the uterus that would otherwise cause rejection of the egg. Unlike human eggs, a canine egg is not fertile at ovulation. To become fertile the egg must undergo further meiotic division that typically occurs 24 to 48 hours after ovulation. With this background, we are able to understand proper timing for a breeding.

3. Hormonal testing to optimize timing of a breeding: Ideally for a natural breeding, you want to inseminate the girl on the day after ovulation, the first day that the eggs might become fertile. That allows the maximum time for viable sperm to fertilize viable eggs. The egg will typically live for 4 days after ovulation. Good fresh sperm is viable for at least five days after ejaculation. Chilled extended semen is viable for about 4 days, one or more of which is taken up by shipment of the semen. Thawed frozen sperm is typically viable for about 24 hours after thawing. Nailing the timing for a breeding therefore depends upon (i) a good estimation of the date of ovulation and (ii) the mode of breeding used. There are two ways to estimate the date of ovulation: LH assays and progesterone testing.

(a) Luteinizing hormone assays: Because the LH “surge” is what actually triggers ovulation, LH assays to detect the surge are the gold standard for determining when ovulation will occur --- about 48 hours after the surge. A further day or two after that the eggs become fertile. The practical problem with LH assays, though, is that the LH surge occurs over a very short period, often 24 hours or less, and can thus be quite easy to miss. In order to be sure that the LH surge is not missed, blood serum samples have to be taken and tested daily, at about the same time each day, ideally beginning the 4th or 5th day of the heat cycle, or when vaginal cytology indicates that about half of the cells in the vaginal wall have become cornified, that is to say have developed roughened, angulated borders. This is all best determined by the repro vet, who might also use progesterone testing (covered next) to determine when to start doing LH assays. All that means a lot of trips to the repro vet. If a breeder has a busy schedule and/or lives far from the repro vet, catching the LH surge is logistically difficult and will always be quite expensive. If even one day of LH testing is missed, and that happens to be the day the surge occurs, all that money and effort have accomplished nothing that could not have been just as easily garnered by progesterone testing. Because frozen sperm is only viable for about 24 hours post thaw, LH testing is an excellent tool for breedings using frozen sperm.

(b) Progesterone testing: Progesterone testing is the other means of estimating the date of ovulation, and the one most used by breeders. Progesterone levels remain low (well less than 1.0) and relatively stable until shortly before ovulation, at which time they start to rise on an asymptotic curve, gradually at first and very quickly later as the eggs leave the follicles and the corpus luteum forms and starts cranking out progesterone. It might take a girl ten days or more to get to a progesterone level of 2.5 or so, but only another day or two after that to reach ovulation levels of 4.8 - 5.0. The eggs will be fertile in about 24-48 hours after ovulation.

(c) Ideal time for breeding: Whichever means of testing is utilized by the breeder natural breeding attempts should start at ovulation and proceed over the next several days thereafter. As one would hope and expect (natural selection being what it is) both the stud and the bitch usually become very excited when progesterone levels hit 8 or so, on the third or fourth day after the LH surge, just as the eggs become fertile. For breedings using shipped chilled or frozen sperm, the bitch owner’s repro vet might want to inseminate the girl when progesterone levels are just a bit higher --- at levels of 12-20 or the fifth or sixth day after the LH surge --- to make sure that every egg available has become viable. Because those are the levels that vets prefer for insemination of chilled or frozen sperm, some breeders seem to think that this is the ideal time to have a natural breeding. It is not. Good fresh sperm will outlive any egg and it might as well be in the girl as soon as the first egg becomes fertile. Moreover, while the boys will still be extremely excited when progesterone levels are at 12-20, that period may well last only a day, and the stud’s interest in the girl will ebb very quickly thereafter. Do not leave yourself just that one day period to get a natural. Insist that the bitch be available at ovulation to give your boy enough time to get the job done.

In sum, attempts at natural breeding should start 2 days after the LH surge, or when progesterone levels hit 5 or so, and would be expected to continue for several days before the stud’s interest wanes. Both stud owner and breeder should do whatever is required to take full advantage of that magical several-day period. That, of course, means that, if a breeder is traveling a long distance, he/she needs to be on the road in time enough to get there for those days. If the semen is to be shipped, it is critical that you as a stud owner do whatever you possibly can to make sure the semen is available for insertion into the bitch on the perfect day(s).

B. Find a Good Repro Vet and a Vet that Can Perform Same Day Progesterone Testing

It is difficult to stress enough just how important it is for the stud owner to have a good reproductive vet. In any kind of breeding other than a successful natural, the breeding team is not limited to breeder and stud owner, it also includes at least one repro vet and often two: one vet to collect and prepare the semen and, where the dog and bitch are not in the same place when the breeding is done, another to receive the semen and effectively deposit it into the girl. **Each of the breeder and the stud owner** has an obligation to the other to assure competent repro vet services for any breeding other than a successful live cover. If the stud has good semen, his reputation can be tarnished by inept insemination by the breeder's repro vet. And, if the breeding was a planned natural at the stud's location that did not pan out, the breeder --- who has invested much time, energy and money in the breeding --- is often at the mercy of the stud owner's repro vet to accomplish the insemination in a timely and effective fashion that is safe for the bitch.

How do you find a good repro vet? Hopefully, you live five minutes away from a repro vet that is a board certified in theriogenology, that all nearby breeders rave about, and that has a solid record of getting girls pregnant in any of the breeding modes that require the use of a vet. If so, count yourself lucky and use that vet. If you are not so fortunate, you must do some investigation.

Foremost, you want qualifications and experience, a vet for whom reproductive work is a true specialty, not just a tangential adjunct to a general practice. If you find a vet that is board certified in theriogenology --- the study of canine reproduction --- that vet will likely be both qualified and experienced. There are, though, many vets that do not have a board certification that are quite capable and have a good record of getting fertile bitches pregnant. If you are considering such a vet, ask around. Inquire of nearby Leo breeders who they use. You might call a nearby AKC all breed club for recommendations from breeders. If you have a vet school nearby, it may well have a good canine repro vet or department.

When you have settled on a candidate or two, don't be shy about asking that vet a lot of questions. How much of their practice is devoted to repro work? Do they have a TCI endoscope (an expensive item that fly-by-night repro vets will probably not have), and how many TCIs do they perform in a year? Will they fit you in on short notice if you have an attempted natural that does not work? Will they come in after hours or on a weekend for an extra fee if need be (those pesky girls have a bad habit of ovulating on Fridays, often on holiday weekends)? If you are naturally shy about such things, blame your questions on us. Tell the vet that someone told you to ask these questions. A good repro vet should not resist questions and should respect the fact that you are asking them.

If you have a repro vet that lives near you, that vet can almost surely do same day progesterone testing. If, like us, your repro vet/s are a two-hour drive away, find a vet near you that can perform same day progesterone testing. It can come in very handy for natural breedings where there is some question whether the girl has ovulated.

When you have a good repro vet and have done all else discussed above, you are ready to breed your boy. It would be a plus, though, to have some understanding of pedigrees and measures of genetic relatedness before you get that first contact from a breeder, both because these subjects could well come up in conversation with breeders and because this is always helpful knowledge to have in evaluating the merits of a proposed match.

C. The Rudiments of Pedigree and Measures of Genetic Relatedness

1. Phenotype and genotype: What you can discern about the traits of your boy by observing him and putting your hands on him --- breed type, conformation and aspects of his temperament --- are often referred to as his "phenotype". But there is, of course, much more to your boy than can be observed or felt. There are also characteristics, good or bad, that do not manifest in your boy but that he nonetheless carries in his genetic heritage that might be passed down to his offspring. What is in your boy's genes, patent or latent, comprises his "genotype". The boy's genotype will greatly affect health and conformation characteristics that your boy may never himself exhibit but that would ideally be taken account

of in a proposed match. For example, If your boy carries a latent genetic propensity for monorchidism (one testicle instead of two), you should avoid breeding him to a bitch that has the same issue in her lines, as this is a recessive trait that is difficult to eradicate from a line once it gets a foothold. Or, if your boy has only fair rear angulation, but comes from lines that typically exhibit excellent rear angulation, that fault of your dog becomes far less significant in breeding decisions. In assessing genotype, you look for clues in your boy's pedigree.

2. Your Boy's Pedigree: Your boy's pedigree is, of course, a record of his ancestry. He is obviously most genetically related to his parents, then his grandparents, then his great grandparents, and so on. The pedigree shows you what progenitors to investigate. Particularly important will be ancestors that show up in the pedigrees of your boy's dam **and** sire. By looking at photos of your boy's ancestors, you might well be able to glean where some of the physical attributes of your boy come from. Gathering reliable information about health of the lines from which your boy comes can be more difficult. You can access some objective health testing information about ancestors, but genetic conditions for which there is no objective testing are not publicly accessible. Information about the health of lines is one of the most sensitive subjects in the breeding world. There are a couple of reasons why breeders are hesitant to share health issues in their lines with puppy buyers or the general public. First, some breeders simply won't do it. The "full disclosure" breeder would thus be at a huge disadvantage in the market, losing potential buyers to other breeders who are not as forthcoming but whose lines are no healthier. Second, full public disclosure of potential health concerns might needlessly worry puppy buyers. There are no Leonberger lines that are free from health issues. Most puppies will go to pet homes. If breeders were to tell would-be pet home purchasers the whole litany of health issues that might conceivably show up in any given puppy, the pet owner might be constantly worried about a range of potential afflictions that are very unlikely ever to present in their pup. **It is especially important, though, that breeders and stud owners be frank with each other in their dealings about known health issues with the dogs to be bred or the lines of those dogs. That is how we improve the breed.**

You're not ever going to be able to learn everything there is to know about your boy's pedigree, much less learn it all in a few months. For now, just learn what you reasonably can; and supplement your knowledge as you go. Where do you start? Talk to your boy's breeder, who will probably know a lot about his/her lines, and check out the Worldwide Independent Leonberger Database.

3. The Worldwide Independent Leonberger Database: This database is found here <http://www.leonberger-database.com/>. It is an amazing resource and one you should familiarize yourself with. If you go to the database you will probably find your boy on it, maybe with a photo that you will wonder how the database even got hold of. Once you find your boy you can look at his ancestors, see what they look like and what their posted health testing showed. This is an invaluable tool for checking pedigrees and Coefficients of Inbreeding ["COI"], a subject covered next. Here is what the World Wide Leonberger database page for our deceased stud previously mentioned looks like: http://www.leonberger-database.com/lite/pp_pedigree_e.php?id=Starhavens%20All%20I%20Want%20For%20Christmas&db=pedigree&gens=5

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4. Measures of genetic relatedness: Pedigree information will tell you a lot about particular traits that might be expected to show up in pups sired by your boy, but you should also know a bit about two different measures of genetic relatedness that might be considered in connection with a particular breeding. Leonbergers have a relatively tight gene pool --- at approximately the mid-point of genetic diversity for AKC breeds. The modern Leo breed was reconstituted after WWI from a very small number of breeding pairs, which capped from the outset the genetic diversity available to the breed. Recent genetic analysis has proven that the registry has stayed remarkably pure ever since. There have not been many other breeds inserted into the Leo registry, and the genetic material of those that were has now been fully assimilated by the gene pool. We have two tools for evaluating the genetic diversity merits of a breeding. One, the "coefficient of inbreeding", is used in breeding to measure the genetic relatedness of pups in a proposed litter in terms of the degree to which the pups will share the genetic material of their collective ancestors. The other, "mean kinship", measures the importance of a particular dog to the gene pool as a whole and allows us to take advantage of what

diversity might be left in the gene pool. We will address each in turn, with the understanding that these are complex topics and summary treatment of them hazards precision.

(a) Coefficients of inbreeding: Terminology first. Genetic information is carried in paired chromosomes --- one from the dam and one from the sire --- in the nuclei of cells. A gene is a chunk of DNA in the chromosomal chain that determines a certain trait. Genes can take alternate forms that affect the expression of that trait. These variations are known as “alleles”, which occur in pairs at specific points on the chromosomal chain. In technical terms, the “coefficient of inbreeding” measures the probability that a dog will inherit two copies of the same allele from an ancestor that occurs on both sides of the pedigree. It is the fraction of all the genes of an animal that have two copies of the same of the same allele. So, for a mating that would result in offspring with an inbreeding coefficient of 15%, there is a 15% chance that any particular gene on the chromosomal chain would have two copies of the same allele, and 15% of all of the genes of the pups will have identical alleles. The coefficient of inbreeding for your boy can probably be found on the Worldwide Leonberger Database [“WLD”]. The WLD page for our deceased stud referenced above is http://www.leonberger-database.com/lite/pp_pedigree_e.php?id=Starhavens%20All%20I%20Want%20For%20Christmas&db=pedigree&gens=5. If you look, you will see that his 10 generation COI is 8.31. That is low for a Leonberger. But for breeding, it is the coefficient for the pups that counts. Even though our example boy had a relatively low 10 generation coefficient, a breeding by him takes account of all common ancestors of **Dam and Sire**. Had we bred that boy to his sister the coefficient of inbreeding for the pups would be very high.

Why does any of this matter? Because high coefficients of inbreeding increase the chance that pups will inherit identical alleles. This can be both good and bad. Breeders strive to produce dogs that come closer, generation after generation, to the breeder’s vision of the perfect Leonberger. Higher coefficients of inbreeding yield more phenotypically consistent litters but also increase the odds of undesirable recessive health issues in the line and generally reduce vigor, potentially impacting longevity, fertility, the immune system, and many other factors. It’s a tough balance to strike. For a good summary of these matters see <http://caninechronicle.com/current-articles/inbred-linebred-and-outcrossed/>. “Line Breeding” where the 10 generation coefficient numbers for the pups might be in the range of 20 to 30 percent can have a lot of benefits, provided that the breeder brings in new blood from time to time to keep the lines vigorous. One approach that we consider a pretty good compromise, and that seems to be gaining some recent momentum in the purebred dog world (borrowed from the horse world), is to base a breeding program on several different families of Leos whose disparate lines are regularly reinjected back into the breeding program over time, together with periodic insertion of relatively unrelated dogs.

Coefficients of inbreeding can be calculated by hand or by apps that are not cheap into which the breed pedigree has been preloaded. If these calculations are done at all, it will usually be the breeder that does them, not the stud owner. For doing the calculations by hand, the formulas are available on the internet. Do keep in mind, though, that a true measure of the coefficient of inbreeding is not merely a five or ten generation calculation, but instead a calculation that goes all the way back to the first known progenitors in the pedigree. The Leonberger breed arguably has the best kept registry of pedigrees in the purebred dog world. It goes back forty generations, which is one reason why Leos are an important breed in the study of canine genetics. But, since the modern Leo breed started from a very few breeding pairs of known ancestry, the further back you search the pedigree in performing the calculations, the higher the COI will be. If you look again at the COI for our deceased boy going all the way back in his pedigree, his COI is 28.96, a number which is only slightly better than average for a Leo that was not the result of a tight inbreeding, such as a breeding of a parent to its offspring, to its parent, to a sibling or to certain aunts or uncles. There is just not that much genetic diversity left in our breed. Which brings us to the second measure of genetic relatedness that a nascent stud owner should be aware of.

(b) Mean Kinship: This measure of genetic relatedness evaluates the significance of a particular animal to the gene pool as a whole. Mean kinship is a vital tool to zookeepers trying to avoid extinction of captive populations. Dogs

with low mean kinship ratings are more genetically important to the breed. At the risk of oversimplifying the details, the principle might best be explained by a hypothetical example. Suppose a breed is developed from a bunch of other breeds to the point where the breeder finally announces: “These ten dogs form a new breed called the “Kaboodle”. The breeder writes a standard describing the ideal Kaboodle and starts a pedigree registry based on these ten founders of the new breed. Thereafter, no other breed or hybrid enters the Kaboodle gene pool. As one would expect none of the original ten Kaboodles perfectly meets the standard. One, affectionately called “Moptail”, has a tail that drags the floor, even though the standard calls for a tail that falls to mid-hock. Another, “Floppy”, has a left ear that bends forward in the middle where the standard prefers an erect ear set in both ears. To preserve the genetic diversity of all ten founders, the breeder nonetheless conscientiously breeds Moptail and Floppy in equal proportion to the other eight and sends the pups out into the world. It turns out, though, that Moptail and Floppy’s peculiarities are genetically persistent, and breeders gradually stop using them and their descendants. It also turns out that “George”, another of the original ten, has a propensity to produce pups that are cross-eyed --- usually when bred to descendants of “Marge”, but George gets most of the blame --- even though George himself was not cross-eyed. George and his progeny are consequently also disfavored in breedings. That leaves only seven of the original ten Kaboodles whose descendants are regularly bred. Fast forward a hundred and fifty years and the descendants of the seven founding dogs that were consistently favored in breedings have now been interbred to the point there is not much at all left of the unique genetic contribution made by any one of those seven. The Kaboodle gene pool has largely become a homogenous blend of the genetic material of seven dogs, seriously threatening the health and vigor of the Kaboodle breed. What can be done about that? The time to shine has finally come for Moptail, Floppy and George. Precisely because their descendants were underutilized by breeders, those very descendants, if any be left, are now the best source of genetic diversity that might reinvigorate the breed. They have low mean kinship ratings and are very important to preservation of the Kaboodle breed.

As of the time this article was written, mean kinship breed calculations have only been extensively performed for two breeds: Leonbergers and Icelandic Shepherds. The calculations for the Icelandic Shepherds identified some significant exploitable diversity. The Leonbergers were not quite so lucky. We don’t really have descendants of any Moptails, Floppys or Georges. On average each of our Leos is 31.4% related to the rest. In what is called “Founder Genome Equivalents” --- the number of founders that, if bred at random, would cause the same diversity as exists in the current population --- Leos have a breed score of 1.59. The actual genetic diversity of our breed is thus now lower than if the breed had been started from **only two** unrelated dogs. *Oliehoek, Peter, Mean Kinship and Genetic History of the Leonberger* 2018 (http://www.leonberger-database.com/mkreport_e.html). Leonberger mean kinship tables divide dogs into three groups: Green, yellow and orange. The green dogs have the lowest mean kinship ratings. The yellow dogs have midrange ratings. The orange dogs have the highest mean kinship scores. This has created a buzz in the breeding community to consider a focus on dogs in the green or yellow categories. But our view is that we should not be quite so quick to heavily prioritize them in any particular breeding, for two reasons. First, the genetic difference between the greenest of the green and the orangest of the orange is only about three percent. We are therefore dealing with what amounts to scraps of diversity. Second, if the green dogs are bred indiscriminately, without careful attention to preserving the diversity in those lines, the green lines will be quickly assimilated and used up by the gene pool. Mean kinship is one factor to be considered in a breeding, but other factors may be far more important.

IV. Now That You Are Ready for a Breeding, Get Your Stud Visible to Breeders

If you’ve done everything discussed above, and your boy is looking like he has a lot to offer, you are now as ready as you will ever be for that first contact from a breeder. But how can you increase your odds of that first contact? Here are some ideas for getting your boy visible to breeders:

A. Get Good “Stacked Photos” of Your Boy

Good stacked photos should be your first priority. Although pictures of your boy running around in the yard or swimming in the surf are great, to catch the eye of breeders who have not seen your boy in person you are going to need “stacked shots” of the boy from the front, the side and the rear. A “stacked shot” is one in which the boy’s feet, body and head carriage have been placed in a way that shows to best advantage his proportions, general structure, conformation traits and expression. Good stacked photos are not easy to get, particularly for boys that have no show training, but they are essential. To their credit, many breeders spend endless hours intently peering at stacked photos of potential studs in the never-ending search for the perfect match for their bitch. (Think Poe here: "Once upon a midnight dreary, while I pondered, weak and weary, over many a quaint and curious volume of forgotten lore . . . stacked photos of potential studs . . .") If you want to optimize your boy’s chances for a breeding, you must have such photos. If you have never done any conformation training or showing, you might consider enlisting the help of someone who has and knows how to get good stacked shots.

B. The LCA Stud Roster

The LCA maintains a roster of stud dogs that is published on the LCA webpage and quarterly in the LeoLetter. This gets your dog a lot of exposure for a small annual fee. The policy explaining the roster and how to sign up for it can be found on the LCA webpage. A boy is first eligible for the roster when he is qualified for breeding under the LCA member practices. Participation in the roster also permits you to place your boy on the LCA LINQ portal in the LCA website, which features photos of your dog and whatever other information you choose to associate with the photos, such as health test results, semen evaluations, BAFL reports, show or other title records, etc. The stud roster and LINQ are one resource where a lot of LCA breeders go to peruse available studs.

C. Consider Conformation Showing

Some experienced breeders with a well-established market for their puppies are more than willing to breed a dog that does not have a conformation championship. Indeed, there are breeders that actively seek out “backyard” dogs that are not known to the community at large; and many of us in the breeding community share information about such dogs when we come across them. That said, a championship on the sire does make a litter more marketable and exposure in the show ring usually makes a stud dog more visible. Though your dog might be used without an AKC champion title, obtaining one will maximize the chances that your boy will be selected. If you decide to pursue a championship, there are two ways to go about it: take some conformation handling lessons and show the dog yourself; or hire a handler. If you want to do it yourself, and are inexperienced, consider starting in the UKC (United Kennel Club) ring before transitioning to the AKC. The UKC is very much more informal and welcoming to newcomers. The UKC registry also has a very long history with our breed and many UKC judges are quite knowledgeable of our standard. Professional handlers are not permitted in the UKC ring. If you decide to hire a handler for the AKC ring, look on the AKC website for its directory of registered handlers or ask for recommendations from AKC exhibitors that show their dogs in your area.

D. Consider a BAFL or CCA Evaluation

These evaluations are discussed in section I.A.3. If you get one, you can post it to the LCA LINQ database where breeders checking the LINQ will be able to see what the BAFL or CCA examiner/s thought of your boy.

E. The Worldwide Independent Leonberger Database

This database is discussed in section III.C.3. If your dog is not in the database, get him on it. If he is there, but his photo is not flattering, submit one of your stacked shots to be used instead.

F. Get Your Dog to Events Where There Are Likely to Be a Lot of Breeders Present

Larger regional specialty shows or LCA Nationals are great venues to get your dog seen by breeders.

G. Consider Joining an LCA Affiliated Regional Club

If you live anywhere close to an LCA affiliated Leonberger breed club, think about joining it. The LCA webpage lists affiliated regional clubs. There will be breeders and knowledgeable folks in every such club who will be happy to answer questions. Even if you never end up breeding your boy, you might make some friends and find some fun social activities or performance events you can do with your boy. A lot of mentorship of all kinds goes on at the level of the affiliated regional clubs.

H. Advertising

The LCA LeoLetter publishes ads in every issue and LeoLetter staff will help you create an ad as a part of the fee. Look through several issues to see some ads and come up with your own take on what you might want. You can also advertise in the catalogs for the Leonberger National Specialty in much the same fashion.

I. Social Media

We personally believe that active marketing of a stud on social media can be rather off-putting. Others may differ, but our general approach to limited social media is to occasionally post a big show win shot or other photo that shows the conformation of our boys as they mature. Much more often, though, we just post photos that we would post regardless of whether our boys were stud dogs, particularly photos that show their individual personalities.

How aggressive to be about marketing a boy at stud is very much an individual choice. Some stud owners actively recruit breedings for their boy/s. Others, like us, simply get our boys visible to breeders and let interested breeders come to us. Whichever approach you decide to take, getting your stud on the LCA roster and LINQ, and taking him to events where the breeders are, should give your boy some shot at getting selected.

V. Dealing with Breeders: First Contact Through Contract

A solid working relationship between breeder and stud owner is grounded in mutual respect and trust. Frank communication is essential. Knowledge is also very helpful, but to some extent we all have to learn as we go. Sometimes the breeder will have more knowledge of how to evaluate and pull off a breeding and sometimes the stud owner will. It just depends on the relative experience of each. Good cooperation makes it easier on all involved and increases the odds of a smooth and fruitful breeding. With these general principles in mind, let's tackle dealings between breeders and stud owners from initial contact through contract.

A. First Contact from a Breeder

You've done all your homework to prepare for a breeding and make your dog known to breeders, and then . . . you wait. Hopefully, probably when you least expect it, comes the day. Maybe you're eating some spaghetti on your couch, watching TV and pondering such weighty questions as whether this is the episode where the treasure of Oak Island is finally found, or why Naked and Afraid blurs all the best bits. A commercial comes on, you check your phone for notifications, and there it is, that long hoped for first inquiry from a breeder asking if you are interested in breeding your boy to one her bitches. INTERESTED? ARE YOU KIDDING ME? AFTER ALL THE WORK I'VE DONE AND MONEY I'VE SPENT? After you dance around for a minute and give your boy a high-five and tell him he might be about to get some, you might start wondering how you should respond. That's a very good question.

First, take a deep breath and try not to get too excited just yet. Different breeders have different approaches to selecting potential studs and contacting their owners. At one end of the spectrum are breeders that develop a

prioritized list of potential studs and go down that list, contacting stud owners one at a time according to the order of priority until they settle on a stud. At the other end of the spectrum are breeders that send near identical messages to several owners of potential studs in order to glean the information they think needful to make their prioritized list in the first instance. Neither approach, or anything in between, is right or wrong. Both make a lot of sense in their own way, from a breeder's perspective. We would, though, urge breeders who are shopping (considering) a number of studs to be clear in their first contact with a stud owner that that is what they are doing. Though it is always gratifying to have a boy considered for a breeding, stud owners are heavily invested in their boys and breeders should take care to be clear about what their level of interest is. It can be very disappointing for a stud owner, especially an inexperienced stud owner, to hear through the grapevine that their boy is just one on a long list of studs under consideration by a breeder. While it is more than fair for the "shopping" breeder to ask for some photos of the stud or for some information that can be provided with relative ease, it is not reasonable for the breeder to send to numerous stud owners a list of questions that might take the stud owner hours to answer. That sort of information is best left for the time at which the breeder's list of potential studs has been paired down and the breeder can provide reciprocal information.

When you do get an inquiry, if there is nothing about the breeding that will rule it out in your mind, you might supply some basic information or documentation that is readily available, and you should ask if there is a good time when you can speak by phone. While electronic communications have their place, there are no substitutes for actual conversation to discuss the merits of the match. That's not too much to ask. If a breeder is not willing to talk to you by phone, the interest level was probably not very high in the first place.

B. Some Subjects for Discussion with the Breeder

Whether in a first conversation or later, here are some subjects that you might want to discuss regarding any proposed breeding:

1. The breeder's motivation for using your boy: There are almost surely particular reasons the breeder is considering your boy out of all the available studs out there. Maybe your boy has a certain conformation trait that the breeder wants to improve in his/her kennel. Maybe the breeder wants to bring back into his/her line some dogs that are ancestors of your boy. Maybe your boy has excellent breed type that the breeder needs in his/her kennel. Perhaps the breeder is focusing on working pups and your boy can do everything from water rescue to Jeopardy. The motivation for using your boy can be a good icebreaker for conversation.

2. When is the girl expected to come into heat: Ideally, a breeder chooses a stud well in advance of the heat cycle for the breeding. But sometimes the bitch is already in heat when you get that first call. If the breeding is imminent, you need to know that sooner than later so that you will have a timeline for getting everything done at the optimal time.

3. Temperaments of the pair: This consideration is obvious. Each of the breeder and stud owner should want to make sure that a dog with a bad temperament is not bred. Preferably, the temperaments of the pair would be complementary. While there is a wide range of acceptable Leo temperaments --- from couch potatoes to driven working dogs --- if two very strong-willed Leos are to be paired, there should a reason for doing that.

4. Type and conformation strengths and weaknesses: In breeding we strive to preserve type and avoid "doubling up" --- i.e. duplicating --- significant conformation faults. Breeder and stud owner alike should therefore be frank about both the strengths and weaknesses of the type and conformation of the stud and bitch.

5. Health: This one is tough. For reasons previously addressed, there are reasons not to disclose to the general public every health issue in a line of dogs. But is critically important that breeders and stud owners be transparent and candid about significant health matters once it is established that the breeder is very interested in using your boy. Each should be forthcoming, but with the understanding that the information will be held in confidence. In an ideal world it

might be different, but in the current environment, a breeder is entitled to know that you will not, without permission, disclose to others any issues that the breeder might tell you about the bitch or her lines. Likewise, the breeder should abide the same standard, keeping in confidence any non-public health information that you provide about your boy or his lines. That is the best compromise we have found to assure rational health decisions, and particularly to avoid undesirable recessive traits that may lurk in the lines of both dogs. As previously mentioned, discussion of health matters should also take account of issues such as allergies, stomach issues, chronic ear infection, skin problems, etc., as these can cause real life, daily problems for puppy buyers.

C. Don't Commit to a Breeding until You Are Sure of the Bona Fides of the Breeder and the Bitch --- Do Some Investigation

You might know the prospective breeder and the bitch personally. If you do, all the better. If you don't, a little investigation is warranted before you commit to the breeding. If you're dealing with an LCA breeder, there is far less concern, because the breeder will not be a puppy mill. But millers are out there looking for registered males to breed to. Don't let yourself be taken in. Puppy millers might seem like perfectly nice folks on the phone. They don't sell hundreds of pups a year by acting like ogres. An upright breeder will not be offended by some questions that will allow you to make sure he/she is not a mill. After all, good breeders themselves rightly worry that mills will get hold of their pups. Ask questions like:

- How many breedings have you done in the last several years?
- What is your website address?
- Where is your kennel located?
- What health tests have been done on your bitch, with what results?
- What percentage of your pups are registered with the AKC?

If the inquiring breeder is evasive or hesitant to answer such questions that is a red flag and should motivate a bit of sleuthing. Make sure you get the registered name and AKC number for the bitch.

Aside from sorting out mills, other investigations that you should do unless you are dealing with someone you know well relate to the health, temperament, type and conformation of the bitch. You can get a pretty good idea of conformation and type from stacked photos that the bitch owner should be willing to send you. You can look for some health issues on the CHIC database or the Worldwide Independent Leonberger database, which publishes some health information. Temperament is a bit different. There is no place online that publishes anything about temperament. If we don't know the bitch or breeder ourselves, we always want to meet the bitch or talk with someone we know and trust that has seen the bitch. We were once asked for a breeding on a tight time frame. The bitch was likely to ovulate in four or five days. The stacked shots were very nice, and the health and pedigree checked out well. But the breeder couldn't tell us of anyone we knew that had ever seen the bitch in person. We said we were ready to do the breeding if she could get the girl to a Leo friend of ours who lived near the breeder to assure the girl's temperament was good. The breeder couldn't do that, for purported logistical reasons. We refused the breeding, only later to hear that the bitch was human aggressive to the point of being unapproachable. If that was true, our policy stood us in good stead for that breeding.

We don't mean to give anyone the idea that there are hoards of unethical breeders out there just waiting to swoop down and take advantage of naïve stud dog owners. You are far more likely to come across breeders that are very committed to producing the best and soundest pups they can. But, in our view at least, stud owners have just as much obligation as breeders to promote the welfare of the Leonberger breed and several hours spent checking out an unknown breeder or bitch is not that big a deal in the grand scheme of things.

D. The Stud Agreement/Contract

When the bitch and stud owner decide they want to move forward, what's next? A stud contract.

1. Why have a contract at all? Legal enforcement of a stud contract will almost never be economically feasible. The main purpose of a stud contract is therefore to assure that both the bitch and stud owners understand exactly what their obligations are. While it's great to have a general understanding of the responsibilities of each party, the devil is in the details. A general understanding might leave questions unanswered that can arise and cause strife later. Perhaps counterintuitively, a stud contract increases trust and reduces stress about a breeding by assuring that all involved know exactly where they stand.

2. What subjects might a contract address? Attached is a sample stud contract that very concisely covers most of the issues that might arise in connection with a breeding. Whatever contract you settle on with a breeder, here are some subjects that you might consider addressing in a contract:

(a) Identification of the parties and dogs to be bred: It is nice for record keeping purposes to have in one place the address and contact information for the owners, and the registered names, AKC registration numbers and CHIC numbers for the bitch and stud.

(b) Health disclosures: Both breeder and stud owner might want access to information about future significant health issues with the stud and bitch, as that information aids both in making breeding decisions down the road.

(c) The stud fee and expenses of the breeding: This can get complicated to state in a contract, because of all the potential permutations involved. But here are some common questions that ought to be addressed:

- *Will there be an election for the stud owner to take a pup from the litter in lieu of a payment?* If so, the contract should specify whether the pup that goes to the stud owner is to be the "pick" of the litter, and, if so, who gets to make the pick --- the stud owner or bitch owner. All should keep in mind that providing for an election by the stud owner to keep the pick pup leaves the breeder in the very difficult position of being unable to market the most promising pup in their litter until the pup is eight weeks old, only to have the stud owner decide not to take a pup. Were that to occur, the breeder is left scrambling to find a show home when potential show purchasers may already have moved on to other litters. An election by the stud owner to take the pick pup is a contractual provision that should not be taken lightly by either party.
- *What is the fee if the owner does not take a pup?* In the Leonberger world the usual monetary stud fee is the sale price of the most expensive pup produced by the litter. We typically charge nothing --- other than a small nonrefundable deposit for use of our **proven** studs --- for a nonpregnancy or a singleton litter. We also reduce the fee somewhat for litters of two or three pups. We just consider that fair to the bitch owner, who will have pumped a lot of time and money into any breeding and is almost sure to be in the red for a litter of three or fewer pups.
- *Who bears what expenses of the breeding?* All out-of-pocket expenses of a breeding, such as expenses of collection or shipment of sperm, are usually borne by the bitch owner. If such expenses are advanced by the stud owner, he/she should be reimbursed promptly upon proffer of receipts, whether or not the bitch becomes pregnant. The stud owner should, of course, periodically check the viability of the stud's sperm. If the boy has sired a litter or had a good semen evaluation within a year of the breeding and the boy has had no serious health problems in the interim, that litter or evaluation is ample indication of viability for a dog under five years old. If the breeder nonetheless wants a semen evaluation shortly before the breeding, we will usually accommodate that request if the breeder is willing to pay the expenses of the evaluation.
- *When should the stud fee be paid?* Payment of the stud fee (as opposed to expenses advanced by the stud owner) is usually due when the pups are eight weeks old. For a natural breeding the stud owner will

have to sign off on the litter registration before the litter can be registered. The bitch owner should pay the stud fee before the stud-owner does that. As we will see later, for any sort of AI breeding, the stud owner has to sign the litter registration form at time of collection of the sperm or upon insemination of the girl, so any provision that the stud owner will not sign registration papers until payment is made should always be limited to successful natural breedings.

- *What is the fee if breeder and stud owner agree that the breeder is permitted to use multiple studs?* This is not usually a consideration, but if the breeder wants to backstop a breeding by use of another stud in addition to your boy, the stud owner should know that in advance. If that is suitable to both, the contract should provide for genetic testing of the pups and specify what the stud fee will be if any pups produced were not sired by your boy.

(d) Brucellosis testing: Brucellosis is a disease that can be picked up by a bitch or stud in various ways and sexually transmitted to another dog. Although we know of no Leos that have had brucellosis, it will invariably render a male sterile and can wipe out an entire kennel were the bitch to contract it. The stud owner should make sure the bitch is tested within a month or so before any natural breeding. Brucellosis testing is not quite as important for the boy --- and most breeds do not test the males --- because Brucellosis will usually swell the boy's testicles to such a remarkable extent that it cannot be missed. You will thus usually know that a stud has had brucellosis. Nevertheless, most Leonberger breeders want the boy to be tested and they are certainly entitled to that peace of mind if they are willing to pay for the testing.

(e) LH or progesterone testing sufficient to assure breeding at the optimal time: For reasons explained in section V.A.2 hereafter, we usually require such testing.

(f) Access to information needed to assess the offspring of the stud: Stud owners are breeders of a sort, and we need information to make sound decisions about future breedings for a boy. We therefore usually reserve an option to evaluate the pups, personally or by proxy, at a time and place convenient to the breeder when the pups are about 8 weeks old. As a practical matter we can't always do this, but it is good to have the option. Likewise, our contracts usually provide that we will receive the registration numbers of the pups and contact information for their owners so we can follow the pups over time. Although this is a privilege that we exercise very sparingly, always careful not to step on the breeder's toes, access to puppy buyers can provide valuable information about what our boys are throwing.

Whatever form of contract you make, or even if you make none, discussion of matters like those mentioned above engender strong relationships between breeder and stud owners. Once you have come to an agreement on the terms of a breeding, all you have to do is wait for the girl to come into heat.

V. At Long Last, the Breeding Itself

A. Set the Breeding up for Success, Whatever Mode Is Used: Nail the Timing and Assure Ovulation of the Bitch

1. Nail the timing: This has been covered above in section *III.B.3* but should be kept foremost in mind as the breeding approaches. Long story short, attempts at natural breedings should start 2 days after the LH surge or when progesterone levels hit 5 or so. Artificial breedings are ideally done when progesterone levels are between 8 and 20, or 5-6 days after the LH surge.

2. Assure ovulation: As we have discussed, once a bitch hits a progesterone level of 2.5, she usually rises very quickly, over the course of one to three days, to ovulation levels of 5.00. Because that is so often the case, some bitch owners will decide at some point shy of ovulation that they have done enough progesterone testing. Any type of

hormonal testing is expensive and can add up in a hurry over the course of a breeding cycle. While it's entirely understandable that breeders would want to avoid the cost of progesterone testing beyond level of 2–3, we believe it's a mistake. Even at those progesterone levels, the bitch can still “stall” in her progression towards ovulation. If she never ovulates and the owners do not know this, it can result in a non-pregnancy and a waste of all the money and time the breeder and the stud owner have sunk into the breeding, when just one more test would have indicated the problem. Although this article generally avoids examples from breedings of our own boys (and we could tell some stories) two such examples are illustrative.

- *Example 1:* The first natural breeding that we ever attempted with one of our boys was to a gorgeous girl, a veritable Leonberger prom-queen. We agreed to house the girl at our home during the breeding process (in those days, we were a one boy household, we would never keep a girl in heat at our home with more than one intact male). Progesterone testing suggested that the girl would likely ovulate within a couple of days after she arrived at our home. We had a good plan in place: If we didn't get a natural breeding that day or the next morning, we would take both dogs to a very experienced nearby mentor-breeder for help with the mating. We had no luck that evening or the next morning. That afternoon, we went to the mentor-breeder as planned. Although there was ample mounting going on, the effort was less than frenetic, leading the mentor-breeder to conclude that our boy lacked libido, despite numerous indications that he was a high drive male. We tried again on our own several times the next day with the same results. That evening the bitch-owner laid down the law: “If you get no breeding tomorrow, proceed by surgical AI no later than the following day or it will be too late.” The next morning, there was still no tie. We scheduled a surgical AI for a day later as the breeder had instructed, but --- pretty confident that our boy had abundant libido --- we also scrambled to find a vet that could do a same day progesterone test. We luckily managed to find such a vet (lesson learned about knowing in advance where to go for same day progesterone testing). The progesterone test showed that the girl had stalled. She was just that day finally about to ovulate, which was expected to occur sometime that night. Early the next morning, with a mixture of dread and hopeful anticipation, we let the girl out to pee and then we released our boy. In less than five minutes we had our first tie ever. An hour later we had called off the surgery and were drinking champagne at 8:00 a.m. That evening we had a second tie that happened almost as quickly. Had we not done that progesterone testing, the bitch would have been submitted to needless anesthesia and surgery and we would have worried that our boy --- who went on to be a deadly reliable natural breeder --- lacked libido.
- *Example 2:* Fast forward from example 1. We agreed to a breeding with a bitch whose owners would be overseas when the breeding was to occur. The bitch would be boarded at a university vet school and delivered to us when she was close to ovulation. Despite a usually reliable cycle, the girl stalled. She was boarded for much longer than expected and delivered to us with a progesterone level indicating that she would probably ovulate a day or two later. We didn't worry much that the girl had not actually ovulated yet, because by then we trusted our boy's nose to be spot on about the perfect time to breed. When she arrived, we tried it. There was quite a bit of interest but no serious flagging from the girl and no rabid mounting by our boy. No sweat, we figured, she's just not quite there yet. We let them run around and play with each other. Ten or fifteen minutes later --- boom, unexpected tie in our back yard. Next morning, rinse and repeat. No major flagging by the girl, no rabid interest by the boy, but another tie. Two long ties, we figure we're good and the girl goes home. But after she was gone, we had some second thoughts. We couldn't be sure that she ever actually ovulated. Suppose she didn't? The day of the ultrasound, we were on edge. That breeding turned out to produce a large litter, but it taught us that it would have been far better to know for sure that she had ovulated.

The lesson of example 1 is that you need to know that the girl has not stalled if there is no tie. The lesson of example 2 is that you need to know that the girl did not stall even if there is a tie, unless you're otherwise sure the bitch ovulated. Combine the two, and the upshot is that, whether or not you get a tie, you need to know that the girl has ovulated. The two examples also have implications for the reputation of the stud. Had we not ourselves done the progesterone test in example 1, the girl would almost surely have become pregnant by surgical insemination, with the result that our boy

would have been considered fertile but lacking in libido. Had the girl in example 2 not become pregnant, our stud's reputation would have been ample libido, but perhaps not fertile. At bottom, both parties have too much time, effort and emotion invested in a breeding not to assure that ovulation has occurred.

We have a lot of Leonberger matings under our belts. Over time, our view of our obligations as stud owners has evolved: once we get to the mating itself (as opposed to evaluation of the match, etc.) our job is to get fertile girls pregnant. Period. We know how to do that, and we will drop everything and bend over backwards to get that job done, but we very much need the testing information necessary to accomplish it.

B. Some Details of Breeding by Artificial Insemination

1. Breedings using shipped frozen sperm: From a timing perspective, this is the easiest sort of breeding there is. The sperm can be collected, frozen and shipped to the bitch owner's repro vet well in advance of ovulation and put in the bitch, usually by TCI or surgical insertion, at the perfect time. The stud owner's responsibility is to make sure that sound semen is shipped with the appropriate AKC litter registration form in the shipping package. The current iteration of the form that authorizes the vet to collect and freeze the semen is here <https://images.akc.org/pdf/ALFZ2.pdf>. The current iteration of the AKC litter registration form that needs to be sent with the frozen semen is here <http://images.akc.org/pdf/frozsem.pdf>. When you suggest to a repro vet that the litter registration form must be completed and included, he/she might think this unusual. Often, it seems, AI breedings are treated as though they were live cover for purposes of registering a litter. However, the LCA tracks the mode of any breeding that was done using an LCA dog, and when the LCA "Breeding Activity Forms" are filled out, the breeder and/or stud owner will be required to report what sort of breeding it was. That is reason enough for completing the litter registration form and including it with the shipment.

2. Breedings using shipped extended chilled semen: The process here is very similar to that for frozen sperm, except that the AKC litter registration form shipped with the semen is different and the timing of the shipment is crucial. The current AKC litter registration form for such a breeding is here <https://images.akc.org/pdf/semefc.pdf>. Because the sperm will be shipped FedEx priority overnight to allow the bitch owner's repro vet time to inseminate the bitch the day after shipment, the bitch owner will probably want the semen shipped 2 days following the LH surge or the day that progesterone levels hit 5 or so. That precise day is tricky to predict because bitches rise at different rates, and when they will hit the magic numbers is inherently unpredictable more than a day or two in advance. When the bitch has her LH surge or when her progesterone hits about 2 or 3 its time for the stud owner to call his/her repro vet to let that vet know what is going on.

(PRO TIP: most good repro vets don't want to know the first day a bitch comes into heat or about every progesterone test along the way. They just want a couple days' notice of expected time of ovulation).

If you know that you are going to be doing a shipped breeding using chilled extended semen, it is good to know of a FedEx office near your repro vet that will ship sperm. As likely as not, the repro vet is going to have to fit you into a busy schedule to achieve perfect timing, and that might happen late in the day, after the daily FedEx pickup for the vet. If the vet has worked with you to make the breeding happen on exactly the right day, the least you can do is take the packaged and ready-to-ship semen to a nearby FedEx office that will process the shipment. It cannot just be put in a FedEx box somewhere.

For a shipped chilled semen breeding, the bitch owner must keep the stud owner well and timely informed of where the girl is in her reproductive cycle. The bitch owner needs to regularly check the bitch for the first signs that she is coming into heat and let the stud owner know when that occurs (just in case the stud owner might need to adjust his/her schedule over the next ten days or two weeks). While it is a waste of money for the bitch owner to start progesterone testing too early where he/she is confident of when the girl started her cycle, testing needs to be done soon enough to assure that the girl has not progressed much more rapidly than might be usual for that bitch. As bitch owners get

hormone testing results, they should let the stud owner know those results. Few things are more aggravating to a stud owner than not to hear from a breeder until the bitch is almost ready to ovulate or has ovulated. This makes it much harder than it needs to be for the stud owner to make arrangements for getting the sperm to the breeder's repro vet at just the right time.

3. Side-by-side vaginal AI or TCI: Side-by-side AIs or TCIs are typically done only when an attempted natural breeding does not come off as hoped. All that is involved is taking both dogs to the repro vet per your back-up plan (back-up planning is discussed below in connection with natural breedings). The vet will collect the semen, centrifuge it, evaluate it and then insert it into the bitch by AI or TCI according to the quality of the sperm and the wishes of the bitch owner. Here again, you need to make sure that the bitch owner leaves the repro vet's office with the appropriate AKC litter registration form executed by the stud owner and vet. The AKC form for a side by side AI is currently here [_https://images.akc.org/pdf/freshse.pdf](https://images.akc.org/pdf/freshse.pdf).

C. Live Cover Breeding, Getting "The Natural"

Let's end this with a "bang", shall we? We'll start with some general considerations to keep in mind and then finish this article with how to do the breeding itself.

1. Overarching considerations:

(a) Always have a back-up plan in place. Although we all hope that every natural breeding will work, that doesn't always happen. These are big animals and there is a lot for the stud and the bitch to figure out on the fly, particularly in a first or early breeding. It helps to have a girl that has been there and done that before and is just a bit on the slutty side (in the most fetchingly lady-like way, of course), but you can't count on that. Maybe the stud and bitch just don't get along well together. Maybe the bitch owner left home just a bit late for her two-day drive and the girl ovulated sooner than expected, so that she is close to the end of the prime period for the boy to get the job done. Anything can happen, so you need to have planned with your repro vet to do an artificial insemination in the event the natural does not come off. Good repro vets will be quite understanding of this approach and do what they can to fit you into a schedule should it be needful. Having a back-up plan will reduce the stress associated with the mating, and that is a good thing for all concerned.

(b) Breed at the stud's home territory or a neutral location. There is a good reason beyond convenience to the stud owner that the bitch usually comes to the stud. The canine mating ritual is triggered by aggressively provocative behavior on the part of the male. The stud will test how receptive the bitch is by insistently licking and pushing/poking the bitch's vulva with his nose or nipping at her shoulders. Because it is his actions that initiate mating, the boy needs to be as confident as he can. Breeding on his own territory bolsters that confidence. If the breeding cannot be done on the stud's home turf, then it should be done in a neutral location. Unless you have a very confident and experienced stud, avoid ever doing the breeding on the bitch's territory where she might be inclined to assume the dominant role. If the breeding can't be done on the stud's territory, scout out in advance a nearby location that has good secure footing and visit the area several times with your boy before the breeding. Do the breeding and any future breedings there and don't use that area for any other purpose. Should your boy be used for other future breedings he will quickly come to associate that place with breeding and will be beyond excited to arrive there.

(c) Stay calm: Easier said than done, especially for a first breeding of a stud or bitch. The stud owner has invested a lot of time, effort and money in developing the boy and the breeder obviously has a lot riding on a pregnancy. Everyone is eager to get a tie, and maybe a bit anxious that it won't happen. But anxiety and excessive hovering won't help get it done. Take a deep breath, remember that you have done everything that you can to set the breeding up for success, and make a conscious effort to relax. The calmer you are you the better it will be for the dogs. Remember that most natural breedings are very unnatural events in the sense that the mating dogs have not

typically had the opportunity to be together for the pre-ovulation part of the courtship ritual that would occur in the wild. The bitch usually arrives at right about ovulation time and the bitch and stud are expected to instantly achieve a tie when they may never have even met before. Our job as breeder and stud owner is to help facilitate by staying out of the way as much as possible while still providing just enough help as may be necessary to get the breeding.

(d) Preserve the stud's energy and keep him cool: Natural breedings can be exhausting for the stud, and especially so for virgin or inexperienced boys. If you get a tie in five minutes, that's fantastic. But, it's more likely to take multiple attempts. If efforts at mounting become sloppy or half-hearted, stop. You want to maximize the chance of success every time there is mounting activity, and repeated efforts when the boy is over-tired are frustrating for both dogs. Give the dogs a good rest and try again later. This becomes more important the warmer it is. Stud dogs have died attempting to mate in hot weather. If it is warm or hot when the breeding is attempted, do whatever it takes to keep the dogs cool. Have an air-conditioned area where they can rest, the colder the better. Have a bucket of ice water nearby that you can duck your boy's feet in if he gets too hot. This will help him recover more quickly. No breeding is worth endangering your boy.

(e) Breeding an aggressive bitch: In all the breedings we have done, we have only encountered one bitch that was actively aggressive towards one of our boys. Though she was a sweetheart to all humans involved, she just wanted nothing to do with a breeding and was not shy about expressing her reluctance. After several short attempts on two successive days, we called it off in favor a TCI, which resulted in a nice sized litter. Some breeders and stud owners might not have gone that route. There are ways of forcing a natural breeding of a bitch that is aggressive – involving everything from muzzles to vet-wrap to ropes --- and we know those ways. We just personally believe that coercively forcing a natural at the risk of injury to one of the dogs or humans involved is not worth it when there is an able repro vet waiting in the wings to put the semen right into the uterus. If you and the breeder jointly decide to force a natural breeding of an aggressive bitch, you will have to look elsewhere for advice about how to get it done.

2. The mating: What follows is what we have found over the years to work best for us. There are doubtless other approaches that work just as well, and we would hope that this article will provoke input from other stud owners and breeders about what has worked for them. The bottom-line goal is to achieve a tie and we are always happy to hear any ideas that might increase the odds of getting it done.

(a) Decide in advance of the mating who will participate and what roles they will play. Having a plan for precisely how the breeding will proceed can prevent a lot of milling around and confusion if the stud and bitch cannot get it done on their own. You don't want numerous people gathered around the pair trying to help them connect on ad hoc basis. We have found it best to start with one person managing the animals and conducting the breeding. Depending on how it goes you may need one other person before it's over, but we don't go there unless extra hands are needed. In our matings, one of us usually conducts the breeding. We have found that this often works better even for the bitch than having the bitch-owner do it. But if the bitch owner has a lot of hands-on experience with mating dogs and the stud owner is inexperienced and not very confident, the bitch owner might be a better choice for the "conductor" of the breeding. Be all that as it may, we discuss with the breeder in advance of arrival of the bitch exactly how we propose to proceed, step by step, subject to whatever contingencies the circumstances may warrant. Having everyone on the same page when the bitch arrives is one more way of eliminating stress and facilitating calm.

(b) The arrival of the bitch through release of the stud: When the girl arrives, we have the boy shut up in the house or a vehicle near the breeding site. The site needs to be secure, by fencing or otherwise, must have good footing, and should have some flat areas and some sloping ground as well (the reason for slopes will appear shortly). If it's been awhile since the bitch had water, we give her some. The girl is then left off-lead for a while to

pee and check out the area. It is important that the girl have ample opportunity to pee before the boy comes into the picture, for two reasons. First, urine kills sperm. You do not want the girl voiding her bladder in the middle of attempts at mounting. Second, as we will see, the first thing a boy will usually do when released into the breeding ground is run around sniffing and licking the ground where the girl has peed. This will tell the boy a lot about where the girl is in her cycle and will excite him tremendously if she is at or past ovulation.

If the bitch is a fluffy-butted girl, then sometime before the boy is released into the breeding area, either the breeder or stud owner might comb or brush the bulk of the hair away from the bitch's vulva to clear a path to the prize. Some breeders or stud owners use Vaseline to slick the hair back away from the vulva. If you decide to go this route make sure that you do not use any petroleum product, such as KY jelly, since petroleum products are spermicides and you do not want spermicides anywhere near your breeding.

After the bitch has explored the area on her own and any butt fluff has been attended to, the conductor of the breeding will usually calmly approach the bitch ---- with the breeder well away but not necessarily out of sight --- put the bitch on a lead and walk her around to get to know her a bit. Excessive talking is not required. She just needs to get comfortable with being handled by the stud owner. Without overdoing it, get the girl used to having her tail handled since you may end up moving her tail to the side during mounting attempts.

(c) Release of the stud through the hoped-for tie: When some rapport has been established between the bitch and the stud owner, the girl is released from the lead and the stud is let out. Don't expect the stud to head right for the bitch, though she might head for him, depending on how eager she is to be bred. The stud will probably first run to wherever the bitch has peed, and sniff and lick those areas and pee on them himself before engaging with the girl.

What happens next can vary a good bit. The stud will probably quickly start the kind of insistent behavior mentioned earlier: poking and licking the bitch's vulva, standing very erect with his head over the bitch's back or withers; and roughly poking or nipping at her withers. If the bitch accepts this behavior that is a very good sign. Mounting might commence right away. If the bitch is standing still and the boy is mounting, great! If you get a tie right away, fantastic! The bitch is at least as likely, though, to want to play a bit first, ducking the poking, licking and nipping behavior, by spinning around or darting away. She might well also run and tease the boy into a game of chase. Some of that is fine and would have been an important part of the normal courtship ritual had both animals been together during the full heat cycle of the bitch. But if the bitch is at or past ovulation you don't want the boy to use up his energy running around endlessly, particularly if it is at all warm on the breeding ground. While we strive for as little human intervention as possible, if too much flirty running is occurring, put the girl on a retractable lead --- this is about the only time we use a retractable lead --- and let the stud and bitch frolic a bit under that constraint while otherwise remaining as inconspicuous as you can.

What we hope to see at some point in the interaction of the two is "flagging" by the girl --- holding her tail straight back and moving it a bit to one side --- which amounts to an invitation to the boy to mount, and mounting activity by the stud. If the stud starts attempting to mount the bitch, but she is turning or sitting to avoid being mounted and doesn't appear to be desisting in that behavior, that is when the stud owner needs to step in. Calmly but confidently grasping the girl by the collar is often enough to make the bitch "stand" for the stud. If not, you may need to place a hand under her chest or a knee under her belly to steady her.

Do keep in mind that there is a lot going on for both animals when the stud mounts the bitch. Leos are not Yorkies. They are large animals that can vary considerably in height and length of body. The boy is reaching forward with his front legs to try and find enough purchase around the shoulders/back of the girl to pull himself forward enough to get his penis in contact with the vulva, and at the same time trying to figure out what is going on at the back end of things. Regrettably, for breeding purposes at least, there is not much for the boy to get a grip on with his front legs (although "handles" on the shoulders of the bitch might ruin the silhouette from a conformation perspective,

they sure would come in handy for breeding.) It is not only physically demanding on the boy, but mentally taxing as well, all at a time when he is out of his mind crazy to get his penis in the girl. Meanwhile, the bitch is bearing at least 70% of the boy's weight on her back and shoulders while the novice or inexperienced boy tries to figure it all out.

How do you tell what, if any, progress is being made? When mounting attempts begin in earnest, whether you are actively controlling the girl or not, keep a close eye on the rear feet of the stud. Where his rear feet are in relation to the rear feet of the bitch is an excellent indication of how close your boy is to getting himself in the right position to achieve a tie without you having to get close enough to the dogs to see where the boy's penis actually is. If the stud's feet are even as much several inches behind the girl's rear feet and he is making no progress getting them any closer than that on successive mounting attempts, then that is the time to take a more active role in the mating. There are several things you can try, starting with the least intrusive and ratcheting up the intervention as needful.

If you are not already holding the bitch by the collar, now is the time to start. Try and pull the bitch very slightly forward with one hand while gently holding her tail out of the way with the other. Getting the tail out of the way removes one potential impediment to penetration and gives you a better view of how close the boy is or isn't to penetration. Small changes in posture of the bitch can make a lot of difference to what leverage the boy has in pulling himself forward and up to get his penis close enough to contact the vulva. A very subtle pull forward on the bitch's collar changes the leverage and posture equation very slightly, and that might be enough to make the difference. If that does not help the boy get his rear feet closer to those of the bitch, then wait for a break in the action and try moving the girl to a slope on the breeding ground, positioning her such that her front quarters are slightly downhill of her rear quarters. This tactic seems especially effective where the girl is significantly shorter than the boy. Try again in this new position. If the boy is still no closer to getting himself in the correct position, it might be time to involve one other person in the breeding.

If the girl is standing for the breeding without any assistance or restraint from you, then you have one hand available to hold the girl's tail out of the way and another to manipulate the boy. If the girl will not stand without some assistance from you, then you are out of available hands, because you are using one to support the bitch and the other to hold her tail out of the way. Call in another person. One of you will need to hold the bitch and keep her tail out of the way, and another will need to help the boy. In helping out the boy, we again want to keep the human interference to a minimum, because the more you manipulate the stud or bitch, the more likely it is that one of them will break off attempts at mating. If the posture and positioning changes have not worked and you must resort to manipulation of the boy, start with putting a hand under his rear haunches and pushing up and forward a bit. In the game of angles and leverage, this might give him the edge he needs to penetrate the girl. If this does not work then you might try to actively direct his penis to the sweet spot, particularly if he is close enough to get penile/vulvar contact but just can't quite figure out the angle. Typically, though, a boy will not put up with much, if any, penile manipulation before he breaks off the attempt. Even if the boy does not break off the attempt, you should keep penile manipulation as limited as you can, because you do not want the stud to ejaculate before he ever penetrates the girl. That can happen rather easily with a high libido male in the heat of a mating to a girl that is post ovulation. (If it does, the boy should be rested before trying again. If the stud has strong semen, a rest of several hours should be ample.)

While all of this is going on, don't forget the principle that you must preserve the boy's energy. Ten quality, vigorous, mountings are far more likely to succeed than a hundred attempts that are sloppy and half-hearted because your boy has become exhausted; and the longer you let him try when he is exhausted the longer it will take him to recover. If you have a high libido boy, he will continue to try until he can barely stand up. You must protect him from that. If he struggles to mount, or tries to mount the girl's head or side, or looks just plain done-in, it has already gone on too long. Segregate the dogs, put them in a cool place with some fresh water and let both

rest and recover for a goodly while. How long is a goodly while? It depends on how tired they were and how hot it is. Five minutes is never going to be enough. Two hours would usually suffice, even if the boy was very tired. But each successive attempt on the same day within several hour intervals should be successively shorter, because the demands on the dogs are cumulative. Ideally, you might try three or four three sessions of about ten or fifteen minutes early in the morning and several more eight or ten hours later. This allows a meaningful rest for both the dogs and should assure some very spirited attempts twice a day.

Usually after any rest period, we will let the dogs try again on their own before providing any help. This is a learning process for inexperienced dogs. No matter how much the owners want a tie, you can be sure that the boy (and often the bitch as well) want it more. If you carefully watch an inexperienced stud while he is mounting a bitch, you often will see subtle differences in approach by the boy. He is trying to figure it out on his own and you need to give him multiple opportunities to do that when he is fresh, while trying to help him as needed before he gets too tired. That is a hard line to walk sometimes. It's just a matter of feeling your way through it as best you can.

If you don't get it done the first day, then you might want to discuss any changes for the following day based on your observations of the breeding attempts. Maybe someone else should take a stab at "conducting" the breeding. Do a bit of brainstorming about what else you might try.

If the natural breeding attempts start on the day of ovulation, you can try for two or three days. You should see a marked difference in effort by the male when the bitch hits a progesterone level of 8 or so. He will instinctively sense that the eggs are now fertile, and his mating attempts will likely show a next-level sense of urgency. This is the prime time to get the natural, even if the boy faltered before. Depending on how fast the girl's progesterone is rising, the boy will likely lose interest on the third day or so post ovulation, and you would not want to delay an AI or TCI much longer than that.

Hopefully, long before you must resort to an AI or TCI, you will get a tie. How will you know when it happens? There are several indications. Often the girl will give a little yip or yelp on penetration. If you hear such a thing there has probably been penetration. Once again, look to the rear feet of your boy. At the start of a tie, his feet will typically be beside or in front of the bitch's rear feet, and the boy's rear hocks and feet will be moving very quickly up and down in a distinctive hammering, piston-like fashion that you will not see at any other point in the mating attempt. We call this "happy feet". The happy feet will not last longer ten seconds, immediately after which the boy will start to raise one his rear legs. What he is attempting to do is lift that foot over the girl's back so that he can turn around and get in a butt-to-butt position with the girl. Help him lift that foot, so he can turn. You now have a tie.

(d) Managing the tie: When you get a tie and the dogs are butt-to-butt, someone should check the time. Although five minutes is plenty adequate for a tie, there seems to be a tradition of keeping track of just how long it lasts. Your only job during a tie is to keep the dogs still and upright for as long as the tie lasts, which could be as much as 45 minutes. You don't have to worry much about keeping the boy quiet. He is at the mercy of the girl and is not likely to want to go anywhere as long as he remains in her grasp. But someone needs to keep an eye and a hand on the girl. Some girls get fidgety during a tie and might want to move away from the boy or sit or lay down. You can't let that happen, because there is a risk of injury to the stud. It usually doesn't take much to hold the girl in place (but there are exceptions, so be ready). If you have her by the collar and have a reassuring hand on her shoulders or chest, she should be content enough to hang around. If she tries to sit, the easiest way to prevent this is to put a knee under her belly so she can't sit. When the tie is over, the dogs will just naturally separate on their own, and it will be quick and obvious when this happens. The girl is then taken to a quiet spot where she can relax, lie down and let the semen percolate for several hours without a lot of movement or distraction. Make sure to get your boy "back together" as described earlier and offer him a good cool drink of water and maybe even a steak for getting it done.

One natural breeding with sound semen at the ideal time is more than enough to fertilize every egg the girl has. Most breeders, though, will want to try for another natural 12 or 24 hours later. They are certainly entitled to that and so is your no-longer-virginal boy.

Conclusion

That's it for our "overview", which turned out to be considerably more involved than originally anticipated. If it all seems overwhelming, please don't overthink it. If you clawed your way through this article from beginning to end, then you already know quite a bit more, right this instant, than we did for our first breeding many years ago. Good luck with your boy! If he turns out to be stud material, go forth and populate the world with sociable, healthy, typey Leos. And if your boy doesn't pan out as a stud, don't spend a minute worrying about it. As we said at the start, every Leo is unique and remarkable. The relationship you can have with any Leo is profound beyond words and every path we take with one is an end unto itself. While those journeys will not always land us where we might have hoped or expected when we took the first step, each unfailingly brings its own rewards.

The references and links provided in this article are current as of September 14, 2022

APPENDIX: SAMPLE STUD CONTRACT

THIS June 1, 2020 _____, ["Stud Owner"], and _____ ["Bitch Owner"] agree to breed Stud Owner's dog _____ ["Stud"], AKC# _____ and CHIC# _____, to Bitch Owner's bitch _____ ["Bitch"], AKC# _____ and CHIC# _____] upon the following terms:

A. Disclosure of Health Information and Breeding History: Each party shall upon request by the other party disclose any known major health problem of the Stud/Bitch, whether currently existing or arising after execution of this contract.

B. Brucellosis Testing: The Bitch shall be tested for Brucellosis within one month prior to breeding. If the Bitch owner requests that the stud be tested for Brucellosis, the Stud Owner will have the stud tested within one month before the breeding.

C. Stud Fee:

1. If the Stud Owner does not keep a puppy from the litter: The total stud fee to be paid by the Bitch Owner for a breeding yielding more than three puppies that survive for 72 hours after whelping is the sale price of the most expensive puppy produced by the breeding, plus any Additional Expenses. The stud fee for a breeding yielding three puppies that survive for more than 72 hours following whelping is \$1,200 plus any Additional Expenses. The stud fee for a breeding yielding two puppies that survive for more than 72 hours following whelping is \$750 plus any Additional Expenses. The stud fee for a breeding yielding one or no puppies that survive for 72 hours after whelping is limited to the Additional Expenses. The stud fee shall be paid no later than the eight-week anniversary of the whelping date. The Stud Owner shall sign litter registration papers at any time requested by the Bitch Owner. The Bitch Owner shall pay the Stud Owner an additional fee of \$100 per week for every week that the balance of the stud fee remains unpaid after the eight-week anniversary of whelping.

2. If the Stud Owner and Bitch Owner agree that the Stud Owner will keep a puppy from the litter and that occurs: The stud fee is limited to reimbursement of any Additional Expenses and a puppy chosen by Stud Owner no later than eight weeks after whelping.

3. "Additional Expenses" as used in paragraphs C.1 and C.2 above are any expenses incurred by the Stud Owner in connection with the breeding, including but not limited to: (1) Expense about the collection, freezing, chilling, storage, preservation, shipping, transportation or insemination of semen or sperm; (2) expense about progesterone testing or keeping of the Bitch; (3) expense about Brucellosis testing of the male; and (4) expense about travel by the Stud Owner, including mileage, at the rate of \$1.00 per mile, for any travel in excess of 150 miles. In the event of a planned artificial breeding, the Bitch Owner shall pay in advance of collection of the Stud all reasonably foreseeable Additional Expenses. Reimbursement of any Additional Expenses advanced by the Stud Owner is due within five days of presentation to the Bitch Owner of a vouched account of such expenses.

D. Bitch to be Bred Only by Stud: The Bitch Owner shall exercise due diligence to assure that the Bitch is bred by no other dog during the same heat cycle in which a breeding is contemplated by this contract. If the Bitch is bred by another dog and produces a litter, the entire stud fee shall be paid as set forth in paragraph C above whether or not the Stud is the sire of the litter.

E. Progesterone Testing: The Bitch will be progesterone tested at regular intervals sufficient to assure that the Bitch ovulates and that breeding occurs at the optimal time.

F. Litter Information and Evaluation: The Bitch Owner will convey to Stud Owner the following information about the litter: Whelping date; the number and sex of the puppies surviving at least 72 hours after birth; contact information for owners of puppies; any major health problems of the puppies; the AKC registration number of each puppy; and any permanent identification number of each puppy. The Stud Owner or his agent may, at a time and place convenient to the Bitch Owner, evaluate any puppy born of the breeding when the litter is approximately eight weeks old. The Stud Owner may from time to time contact puppy owners.

G. Integration, Amendment, Severability and Governing Law: This writing comprises the entire agreement of the parties. Any amendment to this contract shall be in writing signed by the parties. Should any term of this contract be held by any court to be invalid or unenforceable, all other terms remain in full force and effect. This contract is entered into in the Commonwealth of Virginia, regardless of where executed by the Bitch Owner. Construction and enforcement hereof shall be governed by the law of Virginia.

Date: _____, Bitch Owner

Date: _____, Stud Owner