

Title: DNA and the Popular Sire Syndrome

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Summary: What happens when a good dog is just too good?

Just some food for thought, and a good discussion

On another board, someone asked me questions about DNA profiling (and testing) and about the popular sire syndrome. I answered both questions in 1 post. Here is that post. I think it is worth being read on this forum as well.

I think it's best to answer the DNA post together with that popular sire syndrome question. These 2 subjects are just too much related to separate.

I also would like to state that José knows more about all this than I do, but I have less problems explaining in English. English is just not our native language.

I will do my best to explain this in a way that everybody can understand what we are talking about.

One more thing. When I talk about inbreeding, I also mean linebreeding. Having one parent or ancestor in both sire and dam when making a breeding combination.

First the popular sire syndrome

For everybody on this forum that never heard about this before, let me explain in short what this means. When a male becomes very successful, winning lots of shows and titles, HD A, great character, his offspring is also winning lots of shows and also many are HD A and fabulous characters, there is a risk that everybody will go crazy for this male and he will do many many matings worldwide. So much that most of the population will have him as a parent or grandparent in a real short time. This makes inbreeding eventually inevitable. This is bad news in 2 ways.

1. What if this male was a carrier of some recessive genetic problem? Recessive means that a dog needs to have 2 of these genes, to be affected by this problem. We have affected dogs, carriers and cleared dogs. Every parent gives one gene to the puppy, so the puppy has 2 genes on that allele. Use an affected dog with a cleared dog and all the pups will be carriers of this problem. The cleared dog can not give a bad gene to the pup and the effected dog can only give 1 bad gene to the pup. So all the pups will have 1 bad and 1 good gene. The problem will be hiding in all of these pups. Use 2 carriers and the pups will be clear, carrier or effected. Both parents can give either a good gene or a bad gene to a pup. So if 2 bad genes, the pup is affected. If 2 good genes, the pup is cleared. If 1 good and 1 bad, the pup will be a carrier. So breeding 2 carriers is a higher risk of getting affected pups than breeding an affected dog to a cleared dog.

Back to this popular sire. What if he was a carrier of some unknown hidden problem? His pups might be carriers as well (a pup has a 50/50 chance of being a carrier). This problem will only surface if the gene is in a pup twice. When inbreeding, the chances of using 2 carriers of the same defected gene are increased. Meaning, the pups could end up being effected by this genetical problem. This problem happened in the German Sheppard population. A popular sire was a carrier of a haemophilia gene. He was an ancestor is almost the entire German Sheppard population when they first found out about this problem. Meaning, they could not use 2 dogs in a combination that both had this dog as an ancestor! Very difficult when most of the population is offspring from this one

dog..... The best German Sheppard in Germany ever turned out to be a disaster for the breed after all. Luckily, many in the US bred within their own population and did not have offspring of this dog. The German Sheppard breed was saved because of these US dogs.

2. The second way that a popular sire is bad news for a breed is the genepool. This is what Mike referred to. A genepool is all the different genes from one breed together. So all the different genes from all the different bloodlines together. Now there is no such thing as a living creature without any bad gene. If you live old without this problem ever surfacing, you were lucky to be just a carrier of some bad genes and not effected. It is very important to keep as many genes in a breed as possible. This reduces the chance of a bad recessive gene doubling up in pups. The more variety in genes, the healthier a breed is. I'm talking about effected dogs, not carriers, since all our dogs are carriers of something we'd rather not see.

If everybody uses the same stud or his sons, what about the other males? Most won't be used at all. Their genes will not reproduce and disappear from our genepool. And once gone, we can not get them back! Same goes for the brother of that popular sire. The popular sire has only 50% of the genes from his father and the other 50% from his mother. That brother can have many other genes that are just as important to keep our genepool as big as possible! We need as much genetic variety as possible, to keep the number of effected dogs to a minimum.

Now, if a genepair in a dog is similar (so twice the same gene on one allele) we call this homozygote. If a genepair on a dog has 2 different genes (so only one is dominant and therefore visible and the other is recessive, so not visible but only carried) we call this heterozygote. Please keep in mind that not all recessive genes are bad news. Like the gene for blue is d. The gene for black is D. A DD dog is black, not carrying blue. A Dd dog is also black, but is carrying blue and therefore able to produce blue pups (the D is dominant so visible, the d is recessive, so invisible). A dd dog is blue. The DD dog is homozygote for black. A Dd dog is heterozygote for black/blue and a dd dog is homozygote for blue.

Now if a dog has many homozygote genepairs, we can really see what he carries and what he produces. There are beautiful dogs that produce their type very strongly. There are also beautiful dogs that produce their own type very poorly. The good producer is very likely to have many more homozygote genepairs than the bad producer (I'm talking about breedtype). Inbreeding is the fastest way to get as many homozygote genepairs in the offspring as possible. Just double up on all those genes and do the same in the next generation. This is the easiest way to produce consistency in type. But also the most dangerous way, because those bad genes might also double up and you will end up with effected pups of a genetical problem, you probably didn't even know was there. Don't forget that every living creature is carrying bad genes! And by inbreeding so much, we are throwing away a lot of genes from our genepool. If problems show up, we do need those genes! So by using a popular sire, we are overflowing our population with his genes. Other males are not used because we just want that male (or his son) and we are throwing away a lot of genes we will need later. Because eventually, the carried problem WILL show up! If the other dogs that were neglected have died by then..... all those genes are gone for ever. And even a dog that is not used because he might carry a problem, also has a lot of good genes to prevent another problem from surfacing.

Now I made this sound real simple by saying a double bad gene is enough for a problem to surface. Unfortunately, it's not that simple. Some problems are indeed located on one gene. Other problems only surface if a combination of several different genes come together in one pup. Like CHD is not on one gene only. It is on many genes and the combination of genes is responsible for how much the dog will be effected with CHD. An HD A/excellent does still carry bad HD genes. You can count on that. It's even possible that an HD A dog carries more bad HD genes than an HD D dog, in theory. Since they have not isolated the CHD genes yet, we can not DNA test our dogs for this problem. So breeding 2 A dogs still can give us seriously effected dogs. A breeder's worst nightmare. And CHD is

not the only healthproblem that is on multiple genes. And we can still not DNA test for many many healthproblems.

Now I brought up CHD for a reason. It is seen as the worst problem we have in this breed. Let's all start using only A/excellent dogs. WRONG!!!!!!!!!!!!!! By selecting on 1 problem like this, we are throwing away ALL the genes from the B,C,D and E dogs, not just the CHD genes. We are extremely narrowing our genepool. And I know many people say that that's good, because they think they are also getting rid of the bad CHD genes. Wrong again, because that A dog can still carry more bad genes that you would ever imagine. And not only bad CHD genes. But also other problems that will only surface if a series of genes ends up in a particular order in one pup. And all dogs carry bad genes! I will keep repeating that. Too many breeds before us have selected severely on CHD. They ended up with hardly noticeable differences in their hipscores(A are still carriers of bad CHD genes), but also with many other healthproblems that showed up. To name a few problems: epilepsy, PRA, heartfailure, ED, thyroid problems.... The list goes on and on. These problems surfaced, because of overselection. These were all hidden problems, because the genepool had so much variety of genes, that it was very rare that the genecombination to make a problem like this surface ended up in 1 pup. All breeds carry so many healthproblems, without anyone ever noticing. By selecting on 1 problem only and not using any dog that might be effected (B,C,D and E dogs), the genepool got so narrow that all these other problems surfaced. And once a problem surfaced, all possible carriers of that problem were eliminated too. Even less genes to work with and of course the next problem did not wait long to surface after that. And so on, and so on..... Eventually breeds like this need to use dogs from a different breed to get new genes in their genepool. They destroyed a breed so much, that purebred breeding was not even possible anymore. That's sad. Let's not make that mistake with our breed!!!!!!

And I know many people say that if a breed is in such a poor condition that you have to breed carriers of some possible problem, the breed is not worth saving. Well, if these people are correct, please let's all stop having children, because the human race is also not worth saving any more.

Now back to the DNA testing. Let's say they isolated all CHD genes and that we can actually DNA test our breeding stock for CHD. I know that there will be many breeders drinking champagne on that day. I know I will! I also know that many breeders will try to breed that HD cleared dog as soon as possible. And with cleared I do mean genetically cleared, so no bad CHD gene at all. We can DNA test our pups and keep only the ones with the less bad CHD genes to continue with. And make combinations to reduce the chance of getting more bad genes in the next generation. Talking about overselection! This way of breeding will be the shortcut to the end of the breed, because even more genes are eliminated from our genepool in an even shorter time! Other problems will surface, because we will again all be running to that great stud with hardly a bad CHD gene in his body!!!!!! I drink champagne on the day that we can DNA test of CHD, because I can finally use that great HD E stud and preserve his genes. By DNA testing the female, I can see what possible genecombinations the pups will have. If such a bad combination is possible, that a pup will be seriously effected by CHD, I will of course not do this combination. But if that E dog has bad genes that my female does not have, my pups will be carriers of these bad genes, but not be effected. No problem pups will be born and all his genes (not just those bad CHD genes) will still be in our genepool. It will be difficult to find combinations like that, but not impossible. We can keep our genepool bigger as ever if we can DNA test on the current problems in the breed. Breeding a cleared dog to an effected dog will only produce carriers. And carriers can be bred to cleared dogs and only half the pups will still be carriers. And that effected dogs genes (the good genes, not those problem genes) are persevered in the genepool.

I know I make many enemies by saying that I will start using the HD E dogs once we can DNA test. I just use this as an extreme example. Same as the popular sire. I know the damage they do to the breed. But look at the studs I am using myself. I am as guilty as everybody else in narrowing that genepool. I love to use the strong producers that have proven themselves already. I'm not a saint. But I can say that I know what I'm doing. That does not mean that it's good..... But I look at the Dutch genepool and if a great male is not in our pedigrees, I am doing the best I can for the Dutch population. And I just want my pups to look and act like Cane Corsos. Breeding only for health will also cost breedtype. And don't think you can get the looks back in the breed after the breed is healthy. Those good looking genes are gone from our genepool, because there will not be much of a genepool left. And.....all dogs carry bad genes, so the breed will never be fully healthy.

I also made many enemies not too long ago, when this epi thing from Canada surfaced. The male responsible for this problem is known. So too many people started yelling that all the offspring from his famous father had to be eliminated from breeding programs. That's when I stepped in and stood up for that father (some of you on this forum probably saw what happened. And for those who don't..... Let's say if some people could kill me through the internet, they would have done it). This father is not an ancestor from any of my dogs. I stood up because of the overselection thing everybody started asking for, without knowing what they were talking about. This bad dog that caused this problem also has a mother. I asked for her name and it took them several days to find out who she was. Yet they all blamed it on his sire and were yelling that all his offspring had to be eliminated from the breed as soon as possible. Talking about overselection again! This famous sire also carries and produced many good things. And what if this epi thing was caused by a mutation? These things happen. A gene just pops up and is not present in both the parents. The parents are clear, yet the pup is a carrier of a problem. These things happen more often than we think. So when you finally think you got rid of all the bad genes in your population (and have not much left to work with) a mutation destroys all that work and..... Gosh, we have not much left to work with to get rid of that problem again.....

This overselection problem is often referred to as "don't throw away the baby with the bath water".

In short, we could keep our genepool as big as possible to keep our breed healthy!

I'm very happy that the Dutch Cane Corso Club is having a lecture about population genetics in September. This is very important for breeders to know. I really hope all Dutch speaking breeders will come to this lecture!