Designer Genes

Beauty vs. Health

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A few years after I began showing and breeding Miniature Schnauzers, I realized that no historical archives existed for champion producers in Canada in the way they have always been catalogued in the U.S. So, I began gathering the data from old CKC stud books and issues of Dogs In Canada, starting with the first recorded champion in 1933. Somewhere in the middle of the project, I had an epiphany. Everything that I had been told to believe was wrong. Health was not more important than beauty... beauty was more important than health.

As I recorded the names of champion offspring of those dogs of the past, I began to notice patterns. Kennels would emerge, win well for a time, and then fade away upon the arrival of new competition with better winning stock. The majority of sires and dams that had produced multiple champions in their day were virtually absent in modern show pedigrees. Their lines had, for all intents and purposes, become extinct.

As it turned out, the most reliable asset a line could possess wasn't the ability to produce large litters without assistance, live to a ripe old age, or pass a series of health clearances. *It was that someone had to want to breed them, and breed to them.*

The Human Factor

Breeding dogs for the competitive arena is labour intensive and expensive. With little chance of profit, the motivations are largely esoteric - goal attainment, pride in performance, thrill of competition, appreciation of beauty and form. Bloodlines that fulfill these ambitions tend to grow and expand their share of the gene pool, while those that don't, wither away or are relegated to producing puppies for the pet market. It's not to say that winning is the only thing that matters, but it's fair to say that nothing else matters as *much*. For, while gene defects may slow the expansion of a winning family into other lines or force it in a new direction, ugly is fatal.

Each time we are confronted with genetic disease, whether it be in the role of individual breeder, mentor or breed club, it is this "human factor" that must always remain front and center.

> ***"When we force all breeders to do the same thing, we risk forcing all breeders to do the wrong thing."***

Programs designed to reduce defects in a breed or a family, while absolutely necessary for long-term health and control of gene frequencies, must never be permitted to subordinate the quality of animals, or the ability of individual breeders to achieve their aims. Without quality, the line will not survive future selection pressures. Without quality, breeders will find themselves hard pressed to continue.

It is not good enough to promise a light at the end of the tunnel. Those lights must remain on along the route so that individuals are reminded that there is more to breeding dogs than avoiding the bad.

That of course, doesn't grant us license to ignore our problems, or worse yet, to conceal information. Without open and frank disclosures, the very risk reduction strategies that allow breeders to manage disease frequency are impossible.

The first priority for breed clubs is to update our old strategies and accept that genetic disease is a normal part of the makeup of good dogs. While normalizing defects may seem heresy to some, it is only through accepting there is no such thing as a "clear" dog that modern breeding programs will survive the wave of information that is beginning to come ashore. As previously mentioned, new DNA tests are uncovering gene frequencies in some breeds that have the potential to result in the total collapse of gene pools, if efforts at reduction are not carried out with extreme caution. It's imperative that breed clubs get out ahead of this, and begin the re-education process now.

Of course, talking about transformation is easy; putting it into practice at the kennel level, much harder.

Reality Bites

"I just got back from the clinic. I don't know what to do."

Anyone who has found themselves slumped in a chair with a CERF form in one hand and a drink in the other knows the feeling.

For a disturbingly large segment of the fancy, the only "ethical" response is to search for a sword to fling one's breeding program

upon - the more publicly, the better. Not because it's the logical, rational thing to do, but so that they may hold themselves up as morally superior. Every breed club has influential members who hold these well-intentioned, but destructive views. It's time to confront them with reason.

Defective genes have been part of the makeup of breeds for scores of generations. Most became widespread long before veterinary science had the ability to identify, diagnose and treat them, and those breeds managed to survive. Your breeding program can survive, too - but it's up to you. There is no need to cure Rome in a day. Nor is there any need to sacrifice the best animals in a breeding program to avoid criticism from the uninformed and just plain vindictive among your peers. Pleasing your enemies does not turn them into friends.

The first step, particularly for the novice breeder who is facing genetic disease for the first time, is to *give yourself breathing room*. Take no action until your emotions are under control. Go to the field trial, continue your coat work, enter the shows you had planned. Your kennel's participation in the competitive arena should not change because you've had a bad diagnosis - indeed, this is when you most need to remind yourself of the rewards that come from your involvement in dogs. Certainly, some exhibitors may beak and complain. Ignore them.

Take a few weeks to research the defect and your pedigrees. Ask yourself a list of questions designed to determine to what extent the defect can be tolerated in your breeding program, if it must be tolerated, and what impact you will allow it to have on future breeding plans.

1. Does the defect cause significant for pain or reduction in lifespan of the dog? Do affected animals pose a risk to others (aggression behaviors, etc.)? Do effective treatments exist? If chronic, is it difficult or expensive to diagnose or treat?

Generally, the more serious the effect on the dog's well-being and the owner's pocketbook, the less likely you or others will want to risk producing others who might suffer from it.

2. Is the problem common in your breed or the family line? Is it rare? Does it represent something new?

There may be nothing to gain from retiring a dog because he carries a gene that's prevalent in the gene pool. Removing him won't reduce the gene frequency, controlled breeding won't increase it. It may be the "cost of doing business" in that line or breed until improved screening protocols come along. Learning to live with it may be the only choice available.

Conversely, the dog that carries a novel defect has the potential to transform a rare mutation into a common one. Such a dog is capable of raising gene frequencies and introducing disease into lines that are currently clear from it, so must be handled with discretion if bred.

3. Can it be diagnosed in a puppy, or does it show up after the dog is placed in a home, or has embarked on a breeding career?

The earlier a defect can be diagnosed, the easier it is to manage in a breeding program. The pain isn't visited on buyers and the issue remains a "breeder's problem".

4. Is the mode of inheritance known?

The more one knows about the mode of inheritance, the easier it is to balance pedigrees and work around, or even eliminate a problem. (If not, don't draw conclusions as to the genetic status of the parents and offspring. Some modes of inheritance are quite complex, and expression intermittent.)

When those questions have been considered, they must be placed into context:

1. What is the quality of the affected/carrier animal? Does it possess outstanding virtues or is it just average? What does the rest of the health and genetic profile look like? Is it likely to produce puppies that are worth the effort?

2. Is the affected animal from a prosperous family line, or is it rare?

This may require digging deep into your pedigrees, as few modern breeders or even breed clubs are as aware of the originating lines of their breed as they should be.

Rare and distinct family lines may carry valuable alleles important to the genetic diversity and future health of the breed and their extinction should be avoided at all costs. Line preservation trumps genetic disease concerns in all but the most extreme cases. These are the dogs for which the "baby and bathwater" analogy was created.

> ***"Every time a line dies, the breed skips a heartbeat."***

Decision Time

So, let us return to our breeder's CERF form, now that the drink is finished.

In this simplified example, the dog has been diagnosed with cataracts. Cataracts are fairly frequent in the breed. While some research is underway, no DNA test exists. Not much is known about the inheritance, other than it appears to be familial. Cataracts can result in complications and surgery, but most affected dogs live fairly normal lives despite them.

Now, what about the dog and her pedigree?

As you may have deduced, there is no one answer that fits all.

A) The bitch is from a popular line. She's of good quality, but not exceptional. She has a normal-eyed half sister who is two years older. The breeder decides to spay her - there's more where she came from.

B) The bitch is fabulous, with an impressive show career. She's from a popular line, but has never been bred. The breeder chooses a complimentary sire of a line with low incidence of cataracts, with the goal of producing a daughter he can carry on with.

C) The bitch is the last daughter of a rare branch of the breed. She is of good quality and general health. The breeder decides to line breed her to a CERF normal sire who is well up in years, that compliments her type and fortifies her unique pedigree.

All have made rational decisions. Breeding the average bitch from a popular line isn't likely to advance anyone's interests. Spaying an exceptional bitch without ensuring she has a chance to pass on her virtues is not in the long-term interests of any breed. (Mediocre dogs carry disease genes, too!) The breeder who goes on with an affected bitch from a threatened line also has his priorities straight. When in doubt, advance the line. A carrier son or daughter might some day produce puppies that test clear, but quality descendants must exist, or there will be nothing to test.

None of these strategies suggest that a dog with a serious genetic defect should be offered at public stud, or his puppies sold to prolific kennels. But between popular sire and sterilization is a very large middle ground in which dogs that are not suitable for wide use can still make a positive contribution.

As breeders, we have been entrusted with something very precious - a bitch line. Every time one of us fails to produce dogs of sufficient quality to carry it forward, we fail that trust. When we become lazy and indifferent about promoting our good dogs to others, we fail again. The daughter of the daughter fails to produce a daughter that carries on, another branch of the breed dies and the gene pool narrows a tiny bit more.

Doing the "Right" Thing

When managing genetic disease, there is seldom a "one size fits all" solution. Breed clubs need to recognize that individuals have different priorities and challenges, and accommodate this when issuing recommendations.

Most of all, we must recognize the absolute importance of the "human factor" in preserving families and advancing breeds. Breeders are most motivated when they are breeding for something - towards the good, not away from the bad. We need to acknowledge the power of beauty to inspire us, and pledge never to ask a colleague to give up on a dog or a line that they love in the pursuit of a goal that is unattainable - the disease-free breed.

And we must forgive each other's mistakes, for despite our best breeding intentions, there will be many.

It's not important that we all do the right thing - it's only important that we don't all do the wrong thing. When we force all breeders to do the same thing, we risk forcing all breeders to do the wrong thing.

As for those two hundred champions that were retired from my breed to eliminate a single gene? I often wonder where we could have been today if only a handful of the best had been bred one or two times more.