Notes for the Staffordshire Bull Terrier Breed Club Meeting on Hereditary Cataract (HC) and L-2 Hdroxyglutaric Aciduria (L-2 HGA)

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BACKGROUND

Both HC and L-2 HGA are inherited as single autosomal recessive conditions in the Staffordshire Bull Terrier and DNA tests have been developed at the Animal Health Trust to identify both of the mutations involved. This means that a DNA sample from an individual Staffordshire Bull Terrier can be analysed to see whether the dog is clear of, a carrier of, or affected by both of these mutations/conditions. The availability of these two new tests will be of great benefit to Staffordshire Bull Terrier breeders because it will enable them to select against the specific mutations in their breeding programmes and reduce the frequency of both mutant genes in future generations. Obviously, everyone involved in breeding and registering litters of Staffordshire Bull Terriers need to work together to ensure that the breed gains maximal benefit from these new DNA tests.

WHAT HAS BEEN DONE SO FAR?

Following an application from the Breed Council, the Kennel Club has approved an Official DNA Testing Scheme for both HC and L-2 HGA in the Staffordshire Bull Terrier. This means that copies of DNA test certificates that are issued by the Animal Health Trust will be sent directly to the Kennel Club. Test results will then be added to the tested dog's information on the Kennel Club's Registration Database. This will mean the test result for that dog will be published in the next available Breed Records Supplement (BRS); it will also appear on any new registration certificate issued for the dog and on the registration certificates on any of the dog's future progeny. This Scheme is now in operation and the Kennel Club will be issuing a Press Release shortly. In this release, the Kennel Club will invite all those owners who have already had a test done, to send in a copy of the DNA test certificate to the Kennel Club and we will add the information to the dog's registration database.

THE WAY FORWARD?

Obviously, the first thing that needs to be done is to create an acceptance amongst Staffordshire Bull Terrier breeders that all potential breeding stock should be DNA tested for both conditions before they are bred from. Knowing the result for each test will then be able to better inform the breeder about choosing potential mates.

If a dog comes back clear for both diseases, then there really isn't a problem because such dogs will have two normal copies of both of the genes involved and can therefore only pass on normal copies to their offspring.

What about if a dog comes back as a carrier, for either or both conditions? Being a carrier means that the dog will not become clinically affected, but it

will have one normal copy of the gene and one mutant copy of the gene, and it will pass on the mutant gene copy to approximately half of its offspring if it is bred from. How breeders deal with identified carriers is, of course, up to the individual breeder. Some will say that they will not breed from an identified carrier, and that, of course, is their decision. However, my own view is that too few dogs enter the breeding pool in all breeds and to reduce this even further could be to the long-term detriment of the breed. Indeed, for me, one of the major advantages of having a DNA test is that it allows breeders to breed from identified carriers. However, breeding from a carrier imposes extra constraints on the choice of a mate. A known carrier should not be mated to an untested dog, because that dog could be at least an unidentified carrier, nor should a DNA tested carrier dog be mated to another DNA tested carrier dog. This is because if two carriers are mated together, each puppy will have a 1 in 4 chance of being affected, and this is far too high a risk. However, if a carrier is mated to a DNA tested normal dog, then the first thing to remember is that none of the subsequent litter will become clinically affected, but the litter will be a mixture of normal and carrier puppies. Obviously, the availability of two different DNA tests makes this choice slightly more complex, but not insurmountable.

We now have quite a bit of experience with the use of DNA testing for disease genes in other breeds and the following pattern seems to work exceedingly well to reduce the frequency of the offending disease-causing mutation without removing dogs from the breed's breeding pool. The following steps should be followed:

- All potential breeding stock should be DNA tested before they are bred from.
- Identified carriers should not be mated to an untested dog, or to another identified carrier.
- Identified carriers can be mated, but only to a DNA tested normal dog. This allows carriers that have qualities that future generations would benefit from, to pass on those qualities, for example good breed type and temperament. Remember, breeders are trying to produce good all round Staffordshire Bull Terriers, so don't just choose a mate because it is normal with respect to these diseases, that probably will do the breed no favours; try to find a mate that you might have chosen anyway, that is also normal for these conditions.
- If breeders choose to mate a tested carrier dog to a normal dog, then they must undertake to DNA test the resultant puppies to identify those that are carriers and those that are normal. The identified carriers should then be endorsed by the breeder, with the KC endorsement, 'Progeny not eligible for registration'. In other breeds, the cost of litter testing has become an issue, and in these cases what the breed clubs have adopted is that breeders need not DNA test all of the progeny from a carrier X normal mating, but any untested puppies should be endorsed as above.

APPLYING A SIMILAR STRATEGY TO THE STAFFORDSHIRE BULL TERRIER

To my mind, there is absolutely no reason why a similar approach should not be adopted for the control of both HC and L-2 HGA in the Staffordshire Bull Terrier breed. However, I can see at least one complication that needs to be addressed. Thus far, breeding programmes linked to DNA testing for a specific disease-causing mutation have been adopted by breeds that are relatively small, numerically, where most breeders that register their litters with the Kennel Club are members of an appropriate breed club and, commonly, read the dog papers and breed notes. Engaging with these people to inform them about the various proposals has been relatively easy and most, if not all, will have heard of them.

These two new tests are probably the first in a numerically large breed, where significant numbers of breeders registering litters with the Kennel Club will not be members of a breed club and will not, necessarily, be avid readers of the dog press. This, of course, adds a new level of complexity in terms of communicating ideas and schemes to those that need to take the information on board. The one thing that we do have of course is the fact that most breeders are registering their litters with the Kennel Club and new owners are transferring these registrations. The Kennel Club therefore has the appropriate contact details and are thus in a position to disseminate information to these people. We are presently having discussions internally as to how to best achieve this, but there is no reason why we cannot communicate ideas to all those that breed Staffordshire Bull Terriers and register them with us, and get the right messages across with regard to DNA testing.