SmartChart

Tool #1: Genetics

1. The dog breeder's goal is to mate the best to best with the objective of producing dogs who are genetically superior with the whelping of each new generation.

2. Breeding is an art and a science. The art deals with the dogs that breeders select to mate; the science deals with the mating systems which are used.

3. Understanding how a sire and dam pass genes on to offspring can help breeders determine the invalidity of breeding myths.

4. Crossing over is the swapping of corresponding paternal and maternal chromosome segments and helps explain why a puppy might inherit a concentration of chromosomes from a particular grandparent and might therefore resemble that grandparent.

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5. 50% of a puppy's genes come from its sire and 50% from its dam.

6. Parents may pass all their good genes, all their bad genes or a combination of good and bad on to offspring.

7. Littermates differ genetically and breeding to one littermate is not the same as breeding to another.

8. No matter how beautiful the parents, they will always produced some inferior puppies.

9. For dog breeders, phenotype refers to a dog's physical appearance; genotype is the genetic makeup of an animal.

10. For polygenic traits, the phenotype of the offspring tends to be midway between the phenotype of the parents.

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11. The randomness of breeding comes from the fact that there is no way to predict which genes each puppy will receive from its parents; this is mother nature's way of maintaining genetic variability.

12. For a dog to inherit a recessive trait, both parents must pass on the recessive genes.

13. The higher the heritability of a trait, the more a puppy will look like its parents in this trait.

14. Additive traits like angles, movement and temperament, tend to work by what you see helps predict how the dog will produce.

15. Some polygenic traits bordering on medium to high heritability include temperament, front leg assembly, nec, backline, chest width and depth, wither height and front feet.

16. Several genes influence a threshold trait but the trait won't be expressed unless a critical number of genes is present.