



Genetic Concepts in Breeding Dogs

Presented by
Dr. James Sillers

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Genetic Concepts in Breeding Dogs

No matter how good a dog is...

**...he or she will always produce
some inferior puppies!**



Laws

1. Some genes don't blend; each one holds on to its individual identity.
2. The inheritance of each gene is independent of the other.



Gene Behavior

	Sire AA	
Dam	AA	AA
AA	AA	AA

100% AA



Gene Behavior

	Sire A a	
Dam A A	A A	A a
A A	A A	A a

50% AA + 50% Aa



Gene Behavior

	Sire A a	
Dam A a	AA	A a
A a	A a	a a

25% AA + 50% Aa + 25% aa



Genetic Concepts in Breeding Dogs

Gene Behavior

	Sire a a	
Dam	a a	a a
a a	a a	a a

100% aa



Dominant Traits

Deep chest

Prosternum

Straight Backline

Straight Tail

High Tail Set

Long Ears



Dominant Traits

Good Rib Spring

Heavy Bone

Short Leg with Crook

Straight Shoulders

Straight Stifles

Short Coat



Dominant Traits

Weight

Body Height

Compact Foot

Low-set Ears

Long Head

Wide Ear Leather



Dominant Traits

Dewlap

Dark Eye

Correct Bite

Black Nose

Short Face

Good Eyesight

Shyness & Aggression



Recessive Traits

Good Shoulder Layback

Good Stifle Angulation

Reach & Drive

Poor Spring of Rib

Sway Back

Shallow Chest



Recessive Traits

Light Bone

Low Tail Set

Kinked Tail

Long Coat

Longer, Straight Bone

Small or Short Ears



Recessive Traits

Pronounced Occiput

Large Skull Size

Light Eye

Bulging Eye

Overshot/Undershot Bite



Common Misconception

A common misconception among breeders is:

All good traits are dominant.

All bad traits are recessive.



Genotype vs. Phenotype

Genotype is the **genetic make-up** of the dog.

Phenotype refers to how a dog **looks on the outside**.



Laws (continued)

3. What we see on the outside (phenotype) does not always predict what genes a dog is carrying on the inside (genotype).



Laws (continued)

4. Recessive genes, whether they deal with conformation traits or genetic defects, can stay hidden for generations.



Laws (continued)

5. Not all genes act in a simple dominant/recessive manner.



Gene Mannerisms

- Incomplete Dominance
- Polygenic Traits
- Additive Traits
 - » Front & Rear Angles
 - » Gait
 - » Temperament



Breeding Systems

- Inbreeding
- Linebreeding
- Outcrossing



Breeding Systems

Inbreeding

Mating parents & siblings

Linebreeding

Mating relatives other than parents & siblings

Outcrossing

Mating unrelated individuals



Inbreeding

Why Inbreed?

- Increase uniformity of simple traits
- Increase hybrid vigor by outcrossing inbred individuals
- Duplicate genes of favored ancestor



Types of Inbreeding

- Brother, Sister
- Half-brother, Half-sister



Inbreeding

Inbreeding does not *create* genetic defects, but brings them out over time.

Hybrid vigor counteracts effects of inbreeding by increasing fertility.



Pedigree

The individual dog is always more important than the pedigree.

A pedigree is helpful in identifying dogs carrying genetic faults.



Laws (continued)

6. To fix a trait, some form of inbreeding must be used.

Mediocre Dog / Great Pedigree

Great Dog / Mediocre Pedigree



Laws (continued)

7. The offspring, progeny, is ultimately the most valuable source of information on the breeding value of an animal.
 - Dominant Genetic Defects
 - Recessive Genetic Defects



Trait Selection

Conformation Traits – more subjective

Fitness Traits – measurable, more
objective



Objective Traits

Good Health

Normal Growth

Sound Temperament

Good Reproduction

Longevity



Multiple Trait Selection

Breeders tend to select for multiple traits:

Temperament

Balance

Movement

Shoulders

Stifle Angle

Height

Bite

Coat



Breeding Program Do's & Don'ts

When starting a breeding program with a bitch:

- Do have an ideal (picture) in your mind of the dog you are trying to breed
- Do find a mentor before purchasing breeding stock
- Do join a breed club and attend educational seminars
- Do purchase the best bitch you can afford
- Do evaluate as many relatives as possible



Breeding Program Do's & Don'ts

When starting a breeding program with a bitch:

- Don't breed your first pet bitch.
- Don't start a breeding program based on only pedigrees.
- Don't acquire a bitch without a correct temperament.
- Don't skip checking for health issues in her pedigree.
- Don't breed a mediocre individual just because she has a superior pedigree or she is the last of a line.



Breeding Program Do's & Don'ts

When selecting a stud dog:

- Do look at what he has already produced.
- Do request health scores on his ancestors for all important defects in your breed.
- Don't automatically breed to the top winning dog of the day or breeder friend.
- Don't breed a dog just because of his color.



Breeding Program Do's & Don'ts

When selecting a stud dog:

- Don't breed a dog just because he has a lower stud fee or it's more convenient.
- Don't breed to a relative of the dog you should use thinking you will get the same genes as the favored dog.
- Don't breed to a stud dog that has the same faults as the bitch. The faults and virtues of your bitch will determine the stud dog you select.



Health Issues

Typical Health Issues Found in Borzoi:

Thyroid

Epilepsy

Heart Disease

Inherited Eye Diseases

Bloat

Hip Dysplasia



Laws (continued)

8. Never Lose Sight of the whole dog.



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Laws (continued)

Form, Function and Balance



Laws (continued)

9. Remember, we have only one breed standard.



Drag on our Breed

Forechest

Width of Chest

Tail Carriage



Evaluating Puppies





Evaluating Puppies

8 Weeks:

Feet

Pasterns Angle

Length of Neck

Pigment

Hock Length



Evaluating Puppies

8 Weeks:

Underjaw

Head Shape

Forechest

Depth of Chest

Balance Angulation



Evaluating Puppies

12 Weeks:

Ear Set & Size

Head Shape

Topline

Balance Angulation

Forechest

Depth of Chest



Evaluating Puppies

16 Weeks:

Movement

Forechest

Depth of Chest

Eye Color



Evaluating Puppies

20 Weeks:

Front & Rear Angulation

Bite

Tail Carriage



Final Thoughts

Puppy coat is not an indication of adult coat.

Heads improve with age.

Tail carriage is determined at one year of age.



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Photos



Genetic Concepts in Breeding Dogs

8 Weeks





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8 Weeks





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Genetic Concepts in Breeding Dogs

8 & 12 Weeks Comparison





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Successful Breeding!

