Welcome to the SCA Breeders Education Seminar
“A Study of Structure and Movement”
To be a good breeder in any breed, it is important to understand form and function….which is the structure of the dog.

It is also important to have a basic understanding of genetics, to help put the knowledge together and reproduce it.

As a breeder, you must know how the dog should move and all of the parts of the dog that creates that movement.

Most all faults show up in the dogs movement.

Overall structure and movement applies to all breeds of dogs.
In order to understand Schipperke structure and gait, you first need to understand the general principles of structure and movement that apply to four-legged mammals, then those that apply specifically to dogs. Lastly you must examine the characteristics of Schipperskes.

Some general points to consider:
- The skeletal proportions that enable dogs to trot and run most efficiently were worked out mathematically over a hundred years ago.
- They are based on an engineering model analyzing the dog as two dimensional, viewed from the side, moving forward as efficiently as possible.
The principles are broadly true, although movement is affected by much more than bone lengths and angles. Rather, all of the body systems are involved when a dog moves – muscles, ligaments, and tendons; the nervous system; and all of the internal and external organs.

Also, a dog performs many more movements than simply walking or running forward. So you must be aware that for breeders seeking excellent specimens of a breed, even finding ideal bone proportions in a dog does not always mean that it can move efficiently or gracefully, nor perform its job.

For example, a dog may have beautiful bone proportions, yet still suffer from joint or neurological defects that make it unable to move normally.
Expert dog fanciers are agreed that each breed of dog has unique characteristics of movement.

These variations may be simply characteristic of a breed, not necessarily a requirement of their function.

For example, a Miniature Pinscher, not very different in proportions and size from a Schipperke, should have a unique “hackney” gait – which would be most uncharacteristic of a Schipperke.

Yet its historical function as a vermin killer was similar to that of a Schipperke.
Basic Structure

- A Poodle should have a light springy action, very unlike that of a Schipperke, and unlike other retrieving breeds.
- You also need to understand the functions the Schipperke breed was originally meant to perform.
- As a rule, “form follows function” in purebreds, and in order to understand a breed’s anatomy and structure, you must look first to its original working purpose.
Both the American and Canadian Kennel Club standards describe a Schipperke as an agile, active watchdog, a protector of family and property even, and hunter of vermin. The Canadian Kennel Club includes the word “indefatigable.”

- Both standards describe a dog having a thickset, cobby body.
- According to generally accepted principles, a dog that seizes and shakes prey requires a structure similar to that of a draft animal rather than a fast runner.
- A Schipperke fits that image while remaining an athletic, small, all-purpose companion dog.
Years ago, members of a Canadian Schipperke Club participated in a survey of a number of Schipperkes, of varying quality and sizes, not just show quality dogs.

At the end of the survey, averaging the numerous measurements of the better dogs led to the creation of the following outline, which appeared to fulfill the requirements of the AKC and CKC Schipperke standards, while demonstrating the bone proportions expected in theory of a dog of good structure, and potentially good gait.
At first glance, it is difficult to recognize the Schipperke in the line drawing that was compiled, but overlaying it with a sketched in outline of a dog shows it is probably correct.
The resulting silhouette of the Schipperke is one of its most important features.
A Schipperke should be short and square in profile.
That is, the height at the withers should be the same as the
length of the dog from post-sternum (foremost point of the
chest) to the rear of the pelvis.
In actuality, many nicely proportioned, square-appearing dogs
may measure slightly longer than tall, to a maximum of 10
percent more. (Dogs measuring 14-15 percent more appear
“long” in the view of fanciers.)
The minimal increase in length allows more freedom of
movement because of less interference between the front and
rear feet when the dog moves.
The Schipperke is neither a tall nor a short legged dog.
The “drag of the breed” is to a somewhat leggy dog of fine bone.
However, a short-legged, heavy-boned dog is not desired either.
The chest should reach the elbows, and the chest depth and leg
length proportion should be about 50/50.
The head carriage is erect, as in most breeds of dogs, held slightly ahead of the body when the dog is standing.

The head is of normal proportions relative to the size of the dog. It is also a normal shape for dogs, neither long and narrow, nor short and wide overall.

The effect is somewhat fox-like, wedge shaped, narrowing gradually and slightly from the skull to the muzzle.

In proportions, the skull is slightly longer than the muzzle, almost flat on top, the cheeks relatively clean.

The nose is small and black, the muzzle tapering gently to it, moderately filled under the eyes.

The muzzle is neither broad and short, nor narrow and snipey.

The teeth should be strong and even, with a scissors or level bite. As a Schipperke is a ratter, a correct bite is important.
The Schipperke

- The eyes are small, dark, and oval rather than round in shape, set facing normally forward, not on the side of the head.
- Small, well set ears are essential to Schipperke type, although not function. They should be triangular, set on high and upright, not tipping forward in set or carriage.
- The eyes and ears of the Schipperke should portray a questioning expression, curious about everything, impudent and mischievous, never mean or wild.
- The topline is straight, or slightly sloping toward the rear, although often the slope is more apparent than real, created by the heavy ruff fur which tapers to flatter hair over the rump.
- The neck is moderate in length, even appearing short, both because of the upstanding ruff, and the fact that the Schipperke is thickset in build, including the neck. The neck is moderately arched and strong. It needs to be strong to allow the dog to shake its prey sharply.
The Schipperke

- The Schipperke may be born tailless, or is usually docked in North America. The lack of tail is a major part of the unique silhouette of the breed.
- In Europe, because of new laws against docking and cropping, Schipperkes are being exhibited with tails, which may change the silhouette markedly.
- It is unknown why Schipperkes were docked traditionally, but one possibility may be the extreme variability which appears in natural tails, including a natural bobtail. The smaller ancestral herding dogs of Europe, to which the Schipperke appears related, even today have similar variability in tail lengths and carriage.
- The Croatian Sheepdog and Mudi, Corgis, and some Spitz breeds may provide examples.
Front Angulation

- From the side view, a Schipperke should be well angulated, with the angle between scapula (shoulder blade) and humerus (forearm) approaching 90 degrees at the point of the shoulder.
- The length from tip of the shoulder to point of the shoulder should approximate the length from the point of the shoulder to the tip of the elbow.
- This arrangement creates a front assembly that places the elbows well back under the deepest part of the chest of the dog.
- When a Schipperke stands naturally alert, the head should be ahead of the front legs in silhouette.
- A dog standing with its legs directly under its ears lacks adequate angulation, and is probably short in length of forearm.

✓ (Note: The lengths described are not the actual lengths of the bones, but easily palpated locations where bones overlap or join.)
Front Angulation

- The forearm is straight when viewed from any direction.
- The pastern is also short and strong, almost straight, but remains flexible.
- The feet are small, round, and tight.
- Nails are strong, short, and black. Dewclaws are often removed.
- Viewed from the front, the Schipperke should never be narrow, because of the well developed chest.
- Neither should the legs be bowed, or out at the elbow.
Correct Front Angulation

\[ 90^\circ \]
The body of a Schipperke is thickset, well-ribbed up and back, with a short loin.
The chest is broad and deep.
The ribs are well-rounded, but taper in width to the brisket.
The loin tuckup is moderate, definitely present, but not marked.
The topline is firm and muscular, the back relatively broad.
The croup is broad and rounded.
Rear Angulation

- The rear assembly is lighter than the front, but muscular and matched to it in lengths and angles.
- The thigh is well-developed, stifle well-bent, and hock both short and well let down.
- The feet are like the front feet, except that any dewclaws are removed.
- A Schipperke should not be extremely angulated, appearing long-legged in the rear.
- Rather its broad thigh and short hock, like that of a draft animal, allow it to rear strongly upward.
- The breed’s athletic skills in jumping, as for agility competition, and standing up and patty-caking are well-known to owners of Schipperkes, and are dependent upon this strong rear.
Correct Rear Angulation
The real test of a dog's structure is his gait.

In the show ring a dog is judged at a trot, because this gait reveals most efficiently how he uses all of his joints, and controls his limbs and body.

Some dogs exhibit a smoothness and accuracy, an athleticism, not evidenced by others. Such dogs may appear to move effortlessly.

Every breeder dreams of achieving these characteristics in his stock.

Center of gravity
A number of principles apply to the gait of all dogs, no matter what the apparent variations in their build. In moving, any animal attempts to conserve as much energy as possible for that speed. In order to do this, he must move his center of gravity as little as possible. The center of gravity is determined by cutting the dog in two in three dimensions, so that all eight sections are of equal weight located around this point.
**Center of gravity**

- In the stationary dog, this point usually lies about a third of the way up and centrally in the rib cage, close to the heart, slightly behind the elbows.
- In lightly built and tall dogs it is higher than in heavier and shorter dogs.
- A Schipperke's center of gravity is lower than an Italian Greyhound's, because a Schipperke needs stability to perform its function of ratting, which requires characteristics similar to those of a draft animal.
- The Italian Greyhound requires instability, because it can then achieve greater speed in the chase, although at the expense of greater energy.
In the moving animal, the center of gravity is changing at all times.

- Raising and lowering the head, thrusting it forward or backward, changes the forces and weights involved.
- The moving limbs, close to or far from the center of gravity, change its location.
- Greater speed invariably requires larger movements of the center of gravity, lifting it repeatedly at the cost of greater energy expenditure in getting somewhere faster.
Balance

- Balance is a governing principle at all times.
- The efficient use of one body part to balance another minimizes the expenditure of energy and allows for an incredible variety of maneuvers in the animal in motion.
- If it has to, a dog will make compensatory movements in its limbs if balance is not correct, which appear wasteful of energy, but in fact, are minimizing its expenditure because of anomalies somewhere within that animal.
- The best structured dogs have no need of such waste motion.
- Limbs are moved minimally, no farther than necessary from the center of gravity, but freely and smoothly.
In order to quickly assess balance in the profile of the standing dog, one merely needs to mentally imagine four lines dropped perpendicularly through:

- a) the point of the shoulder, where the humerus joins the scapula
- b) the upper and rear most point of the scapula
- c) the front of the knee, or stifle joint
- d) the "pin bones"

Then proceed to compare the distances between lines _a_ and _b_, and _c_ and _d_.

In the balanced dog, these measurements should be approximately equal.

In dogs with theoretically ideal bone lengths and angles, these distances are wide, providing maximum support and stability in all phases of stance and gait.
The dog on the left is balanced, with good support front and rear.
The center dog is also balanced, but lacks support, because of steeper angulation front and rear.
The dog on the right is not balanced. It has steep angulation in front, and excess angulation in the rear – and not as much support in the rear as the balanced dog on the left.
The dog should be observed both "coming" and "going"- (moving directly toward and away from an observer) as part of the observation of gait.

Beginners can detect anomalies more easily in these directions, although they may not understand why the variations occur.

Ideally, the limbs seen from the front and the rear should appear to the unaided eye to move in straight planes from the shoulder or hip joints, forward and backward, with the front and rear legs equidistant, so that the rear legs can scarcely be seen from the front, and vice versa.
The side-to-side roll of the body should be minimal.

In the Schipperke, because of the body being slightly stouter than in the "average" dog, this roll is somewhat more in evidence than in a slimmer built dog.

Also, the front legs may even be wider apart than the rear, so the rear legs can be seen between them. This is not considered correct.
**Movement Faults**

- "Crabbing", or hind legs falling so one is between the front legs, and the other to either side of the front leg (sometimes alternately!), indicates that rear "reach" is greater than front "reach" for some reason, or that the dog is too short in body.
- "Elbowing out" occurring in a dog that stands correctly, or "winging", "padding", "hocking in" or "out", "toeing in" or "out," "swinging" one leg more than another, all indicate a lack of balance somewhere that requires compensation, not necessarily in the offending limb.
- Minor aberrations in joint structures as well as incorrect bone proportions may be implicated.
- Evidence of these faults may appear in the stationary dog, especially if it is mature.
The side gait is more revealing still to the educated observer.

Ideally the position of the head is moved slightly forward and lower as the dog speeds up.

It should never be carried lower than the level of the back at even a fast trot, unless the dog is deliberately attempting to lower it, perhaps to sniff.

A very upright head carriage will indicate stiffness or lack of angulation, usually in the shoulders, and perhaps cause restriction in the forward reach (which is as far as the nose), or a hackney-type gait.

The neck should retain a slight arch at any gait, blending smoothly into the topline.

The topline should appear level or slightly sloping at all times.
**Side Gait**

- Dips behind the shoulders, or excessive roll may indicate poor structure or lack of fitness.
- A topline that appears to "V", jouncing and breaking in mid-back at every stride, displays a severe lack of balance. Such animals should never be selected for working specimens, any more than one with joint defects such as those caused by patellar luxation or Legg Perthes.
- The forelegs should move with a pendulum-like action, equally forward and backward, with maximum "reach" but minimal lift from the ground.
- At its greatest forward extension, easy to observe because of the momentary halt in action as the leg reverses direction, the leg and foot should form a straight line.
- Bent pasterns at this point indicate difficulties.
Side Gait

- As the body propels forward over it, foot on the ground, the foreleg reaches the perpendicular, and the leg is "shortened" in mammals by the bones of the pastern (the wrist in humans) "locking" into place for stability in accepting the animal’s full weight.

- As the body continues to vault forward, the forepaw comes back and off the ground, finally flipping up, using the pastern.

- This action utilizes stored elastic tensions in the ligaments to reduce calorie expenditure required by muscle movements.

- At this time the pastern should not be bent excessively or too little.

- As the pastern flexes at the most backward and upward point underneath the body, it must be timed exquisitely to lift out of the way of the hind foot landing beneath it, actually ahead of it because of the forward momentum of the dog.
This last point causes much discussion among breeders and judges, perhaps because the unaided eye is unable to detect what is truly happening.

- To the naked eye, the hind foot should appear to fall in the print left by the forefoot on the same side.
- On film, or examining the footprints of the dog, it can be determined that the hind foot is actually landing ahead of the print of the forefoot, by as much as an inch to two inches in correctly gaited Schipperkes, sometimes more.
- If footprints demonstrate that a dog's hind print falls on the fore print, he is either trotting very slowly, or has a very inadequate gait, usually because of lack of angulation.
- To the unaided eye, this dog's rear foot will appear to fall short of the forefoot in its placement.
The period of suspension during various gaits, evidenced by this "overreach", allows a four legged animal to increase its speed through utilizing its length of body, thus effectively increasing its speed relative to that of an upright two-legged animal.

- The hind legs should show an equal length of reach to the forelegs, extending well under the body, and equally well back.
- The feet should not kick up high under the belly, and the whole leg should straighten well through the joints as it extends back, with no waste motion.
- The feet should remain relatively close to the ground at all times, even at full extension:
- The legs should form an apparently straight line at the furthestmost point of extension, but not flex in the hock and kick upwards.
Nonetheless, from the side view the hock joint should both flex and extend, and should not appear to be "carried", as if the whole leg were one straight piece swinging like a pendulum.

On extremely slow motion film, the rear legs can be observed to go through some incredible twisting and rotation, reaching under the centre of the body, then twisting back around the opposing back leg before extending backward.

The forelegs on slow motion film evidence a similar rotation and twisting.

All action is aimed at the dog placing each foot as closely as possible beneath the center of gravity while it is supporting the dog's weight.
**Side Gait**

- It should be noted that a dog that moves most efficiently will normally stand with its forefeet pointing very slightly outward, just 5 - 10 degrees, because stationary balance distributes the weight equally between the pairs of legs if the dog is standing squarely.

- But because the full frontal weight is supported alternately in the moving dog, the foot must be placed more centrally, perfectly vertically for maximum support.

- (Normally built humans do the same thing. Standing with your feet pointing straight forward is uncomfortable. Try standing on one leg and you will discover the change in position required in the moving animal.)
Finally, in slow motion film, you may observe a surprising amount of roll and twisting in the spine of the dog. This twisting is necessary because the push from the rear legs is transmitted to the front through the spine, which is flexible. In the best moving animals this movement is smooth and well coordinated in all planes, scarcely noticeable to the unaided eye.
The following drawings are traced from film of actual Schipperkes standing posed naturally, along with one frame of the best example from the same film of the dog at full extension of stride while trotting on leash with a handler.

All of the dogs are champions, but variations in structure become obvious with careful examination.
- Dog A (male)
- This dog has the best balance and angulation of the three.
- Note the equal length of stride in front and rear, the amount of extension, and the timing and coordination of the front and rear feet.
- Dog B (male)
- (This dog’s stationary topline did not look “bumpy” in real life.)
- This dog is lacking in angulation front and rear, although he is balanced, and very nice coming and going.
- He lacked the athleticism of Dog A for jumping as well as trotting and galloping. Note the difference in stride length, and in topline, compared to dog A, despite coordination of front and rear feet.
Dog C (female)

- This dog lacks balance.
- She has good angulation in front, but lacks angulation in her rear.
- The imbalance can be seen at full stride. She does not extend her rear leg fully back, and the front and rear feet are not coordinated correctly.
Another tracing of a different portion of her side gait stride betrays her tendency to lift a front paw too high with the pastern still bent as she moves a foreleg forward, probably trying to delay it to coordinate with the inadequate reach by the rear foot.

(The fault was not so severe that she showed a definitely bent pastern at the topmost point of her front reach.)
Schipperkes I have measured demonstrate stride lengths varying from 22 inches to 32 inches. (I am defining stride length as the distance from where one foot touches the ground, to where the same foot touches again, at a moderate to fast trot.)

- Generally the better gaited dogs had longer strides, in fact, much longer than the stride of poorly gaited dogs.
- Only the poorest moving, or very elderly dogs did not overreach, or overreached only 1/4 inch at a moderately fast trot.

✓ Overreach means that the hind foot falls on a point ahead of the print just left by the preceding front foot.
**Stride Length**

- To the unaided eye of an observer watching the dog trot, the hind foot appears to land on the spot where the front foot was.
  - This optical illusion occurs because the whole body of the dog is being carried forward simultaneously with the legs which are moving additionally.
- The best trotting dogs, especially as young animals, overreached at least two inches.
- The average length of stride would be about 25 inches in a normal sized Schipperke. As a rule, I would state that a Schipperke's stride should be at least twice as long as its height, and perhaps exceed this measurement by 2 - 4 inches in the better moving dogs.
**Stride Length**

- The footprints of the Schipperke typically fall one to two inches from the center tracking line, closer than the measurement at the elbows, so the feet do converge in toward the center of gravity as expected.
- To the unaided eye of the observer, the legs appear to be moving in parallel lines.
- Naturally, Schipperkes do not single track, because they have a relatively broad body.
- Overreach is about 2 1/2”
- Front feet land about 3” apart
- Hind feet land to inside of front feet, about 2” apart

Schipperke female
(height at withers 12”)

Stride length 28”

LR
LF
RR
ORF
To understand gait it is important to study all breeds of dogs.
It is often times easier to see in the non-coated breeds.
There are many good books and videos on the subject.
There are 3 basic types of movement.
  ✓ 1. Movement coming
  ✓ 2. Movement going
  ✓ 3. Side movement
All 3 are equally important!
A correctly moving dog shows correct movement from all angles.
Proper Schipperke movement is a smooth, well coordinated and graceful trot (basically double tracking at a moderate speed), with a tendency to gradually converge toward the center of balance beneath the dog as speed increases.

✓ From the Schipperke standard
Correct Double Tracking

Notice that you see only one “set” of legs in either direction
Double Tracking

- IDEAL GAIT COMING OR GOING...ALL LEGS AND FEET SHOULD BE TRACKING IN THE SAME DIRECTION
- This is a beautiful example of double tracking.
- Note the equal distance between the front and rear legs and feet.
- There is no swinging of the legs.
- The dogs feet barely clear the ground.
- When the dog is coming or going you should only see one set of legs.
- This is considered "clean" gait and while hard to achieve, is desirable.
This front movement is faulty…
- Notice the slight convergence of the front and the bending of the leg
- Notice the excessive lifting of the front leg
Incorrect Double Tracking / Going

- Notice that you can see the front leg on this dog moving away.
- Notice that the front leg curves as well.
Comparison

[Images of two different animal butts]
Reach and Drive

- Front and rear must be in perfect balance with good reach in front and drive in rear.
- The topline remains level or slightly sloping downward from the shoulders to the rump.
- When the schipperke moves correctly, all four legs reach forward and extend rearward at equal distances. The front paw flexes (thus the need for a slight bend to the pastern) on the follow through under the body and the hind foot slips neatly under it to occupy the spot vacated by the front foot.
- For the schipperke to move with good reach and drive, it is necessary for the front to sit well underneath the body as described by the standard.
Correct Side Gait

- Reach and drive while still “holding” the silhouette.
- Notice how the feet barely clear the ground.
With good reach in the front, the leg should extend to the front of the nose.
Gait: Reach and Drive

- When driving from the rear you should see the pad of the rear foot
Notice the positioning of the feet
What Affects the Movement?

- The balance and structure of the dog!
- The schipperke is a square dog.
- The standard calls for the dog to be “square” in profile.
- This means the entire dog must be square, not just his body.
- The entire dog should fit in the square!
The key word here is PROFILE.

The dog that is square in profile will fill the square box.
The body in profile is square in that a horizontal line from the front of the forechest to the rear projection of the upper thigh should equal the length of a vertical line dropped from the top of the withers to the ground.

The length of leg must balance with the length of body to give the striking square appearance.
Too Short in Back

- Same square...same dog with a shorter back...the dog no longer fits the square.
- While this dog is nice and short backed...it is NOT square in profile...
- While we all want a nice short back, as breeders we must be careful not to change the balance of the profile.
Balance is the foundation that movement is built on. It is the key to good structure.
Long & Low on Leg

- Same dog, long in back, low on leg...the two often go together.
- Again... balance is the key word!
Correct Balance: Fronts

- The standard calls for the front to sit well underneath the body.
- This is necessary for the dog to have the correct well laid back shoulder angulation.
- This angulation is what produces good front reach when viewed from the side.
- Side gait is what allows a dog to work all day without tiring.
Proper Shoulder Angulation

- A well laid back shoulder should form an approximate triangle.
- THE DISTANCE FROM THE WITHERS TO THE POINT OF THE SHOULDER SHOULD BE APPROXIMATELY THE SAME AS THE DISTANCE FROM THE SHOULDER TO THE ELBOW
Front well underneath the dog

- When the dog’s front sits well underneath the body, the head and ears should be well in front of the line.
- If the head and ears are right above the dog’s legs...the dog is straight in shoulder.
Straight Shoulders
Correct Rear

- When the rear is correctly angled you should be able to drop a line from the point of the buttocks to the rear toes.
Ever wondered why a dog looks like he is built to move, but doesn’t seem to get the job done?

It is usually due to lack of conditioning which affects muscle tone and ligaments, both of which are important to the well moving dog.

Crated dogs rarely have good muscle tone....exercise your schipperke!

Often times dogs move bad due to lack of training on the leash...and different surfaces...ie: grass, rocks, etc.

Train your schipperke daily, and on all surfaces.

Put the balance of breeding together with a well trained dog and you will have a winner!
Many thanks to “Skip” Stanbridge for allowing the SCA to use portions of his seminar.

I highly recommend you attend one of his seminars if possible!

“Skip” is a well known Belgian Shepherd breeder and an AKC judge with many years experience.

The purpose of his seminar is to examine the various structures of square dogs and the resulting impact on the length of their backs.

Remember, this is just a part of his complete seminar!
Proper Angulation

- The next slide is an example of a short backed, square dog with proper angulation, front and rear.
- The purple line denotes the topline.
- The green line denotes the actual back of the dog.
- Notice the difference between the two!
Short Back-Square Dog Topline VS Back
Movement

- The following slides show this dog actually moving.
- Pay attention to the back and topline.
- Watch the length of the dogs strides.
- Notice the position of the head and neck as the dogs stride increases.
The Square Dog
The Square Dog
The Square Dog
- A standing square dog with correct bone angles & lengths.
- Balance between front & rear angulation.
  - Short back & correct croup
  - Dog stands well over itself.
  - Short distance between front & back legs
A moving square dog with correct bone angles & lengths.

Note: Balance between front reach & rear drive

- Maintains short back
- Ground covering gait
- A square standing dog with straight but balanced bone angles and length
- **Note:** Straight shoulders & step croup.
  - ✔ Longer back.
  - ✔ Increased distance between front & back legs
**Figures 1 and 2**

- **Figure 1:** A standing square dog with correct bone angles & lengths.
  - Note: Balance between front & rear angulation.
    - Short back & correct croup
    - Dog stands well over itself.
    - Short distance between front & back legs

- **Figure 2:** A square standing dog with straight but balanced bone angles and length.
  - Note: Straight shoulders & step croup.
    - Longer back.
    - Increased distance between front & back legs
A moving square dog with straighter but balanced bone angles and lengths in motion.

Note: Reduced front reach & rear drive.
- Longer length of back.
- Less ground covering gait
- A standing square dog with straight shoulders, short upper arms & straight unbalanced rear.
- **Note:** Straight shoulders & steep croup.
  - ✓ Longer back.
  - ✓ Increased distance between front & back legs
Figure 3A

- A moving square dog with straight shoulders, short upper arms and straight unbalanced rear.
- Note: Reduced front reach & unbalanced rear drive
  - Increased length of back.
  - Less ground covering gait.
All Figures

Figure 1

Figure 2

Figure 3

Figure 1A

Figure 2A

Figure 3A
Genetics is a complicated subject that requires much reading and research to understand. There are many good books and articles on the subject that the serious breeder should obtain.

This discussion will be very basic.

- **Genotype:** This refers to the genes the dog actually possess.
- **Phenotype:** These are the genes the dog physically shows.

The relationship between the genotype and phenotype is a simple one ... the genotype “codes” for the phenotype.

An example:

- If the dog possess phenotype for “bad rears”, chances are good they carry the “genes” for that rear as well…
### Basic Genetics

**Recessive Inheritance**
- Both parents carry a normal gene (N), and a faulty, recessive, gene (n). The parents, although carriers, are unaffected by the faulty gene. Their offspring are affected, not affected, or carriers. This type of inheritance was first shown by Mendel.

**Dominant Inheritance**
- One parent has a single, faulty dominant gene (D), which overpowers its normal counterpart (d), affecting that parent.
- When the affected parent mates with an unaffected and non-carrier mate (dd), the offspring are either affected or not affected, but they are not carriers.

**If a genetic trait is recessive, a person needs to inherit two copies of the gene for the trait to be expressed**
If the gene contains 2 matching alleles it is said to be "homozygous"
  ✓ And more apt to reproduce that particular gene

2 different alleles = "heterozygous"
  ✓ And less likely to reproduce with consistency

In heterozygous individuals, the allele that is "expressed" (seen in individual’s appearance) is the "dominant" allele

The traits that are expressed make up your "phenotype"

The allele that is not expressed is the "recessive" allele

There are more than 2 alleles for some traits
  ✓ Most traits, in fact, are affected by more than 1 gene
I met with a genetic counselor recently at one of the big University hospitals in Chicago. She explained “how cancer happens.” It wasn’t about dogs, but applies to them too.

Cells aren't just normal or cancer. There are a lot of intermediate steps. She used the #5 as an example.

On one side of the page you have "healthy cells", then four more sets of cells progressing across the page, ending in cancer cells.

- healthy......mutation 1......mutation 2......mutation 3......cancer

Our cells are constantly dividing and mutating.

- With a normal healthy immune system, we can move back to the left a level with relative ease.
- If the cells become "mutation 1", our immune system fixes them and they move back to “healthy”.
- So the move back and forth to mutation 1 is normal, and constantly occurring in our bodies.
Now, for the genetic link....if we inherit a defective gene from ONE parent, we don't *really* start at healthy.

- We start at "mutation 1".

- When the normal mutations occur, they bump us to "mutation 2"... one step closer to cancer. If we inherit defective genes from BOTH parents, we start at "mutation 2".

- Now we're mutating pretty close to "cancer" just by normal mutations. Following the example, just the normally occurring mutations now put us at "mutation 3", just one step from cancer. We're a walking time bomb.

  ✓ healthy......mutation 1......mutation 2......mutation 3.....cancer
Other Factors

✓ healthy......mutation 1......mutation 2......mutation 3......cancer

• The environment plays a role in that it also bumps us a level.
• That is to say, chronic irritation from a *mild* irritant (cigarette smoke, drinking, food additives, radon, take your pick of millions) will bump us a level.
• So, if we're a healthy cell person, and we have chronic irritation, it probably won't make much difference (at least when we're young, hold the age thought for a moment)
Bear in mind, we're excluding the serious carcinogens like arsenic. If you take a person with defective genes from both parents (mutation level 2), add an irritant (now we're at level 3), and then allow for just normal mutation...BINGO....cancer.

- healthy......mutation 1......mutation 2......mutation 3.....cancer

Age figures into the equation because it causes us to lose the ability to "repair", or move back a level, thus effectively causing us to slowly progress down the line to cancer just with normal mutations.

Depending on our other risk factors (genetics and environment), we will progress either fast or slow as we age.

- It's why there is so much cancer in the elderly population.
Why is it so hard to consistently reproduce certain genes?

- Chromosomes of offspring don’t have a half that’s clearly from dad and a half that’s from mom.
- During duplication there is "crossing over" of bits of each half.
- Dominance/recessiveness refers to phenotype, not genotype.
- Sex linkage is the phenotypic expression of an allele that is related to the gender of the individual and is directly tied to the sex chromosomes.
- This mode of inheritance is in contrast to the inheritance of traits on autosomal chromosomes, where both sexes have the same probability of expressing the trait.
The easiest way to predict the genes is by tight breeding to help control the gene pool.

One must always do tight breeding on dogs that show great phenotype...

Pick a dog that has great phenotype and has a producing record for the best predictability.

Mediocrity produces mediocrity as a rule!

Breed only from the best!
Merits of Linebreeding, Inbreeding and Outcrossing

- Outcrossing is the breeding of basically unrelated animals and should only be used if and when you need to add something to your breeding program that you can’t get by linebreeding.
- When you outcross...keep the dog that possess the trait you outcrossed to get!
- It often times doesn’t look like what you are used to seeing.
- Breed it back into your line to and keep the puppy that shows that trait.
- Often times it will be this puppy that produces what you are looking for.
- Remember that outcrossing brings in faults as well as virtues...pick your outcrossed line wisely.
Merits of Linebreeding, Inbreeding and Outcrossing

- Linebreeding is the general acceptable form of breeding.
- It consists of breeding related animals from the “same” line, or family.
- By controlling the ancestors, you help control the gene pool which helps you predict the results.
- Pick one or two great animals to linebreed on…otherwise, you won’t be linebreeding at all.
- Be sure he has the phenotype you want to reproduce and that he is “genetically” pure as well.
- Select offspring that contains the traits you are linebreeding to get.
- Successful breeding means choosing wisely.
Merits of Linebreeding, Inbreeding and Outcrossing

- Inbreeding is commonly referred to when you breed father to daughter, mother to son, or full brother and sister.
- Inbreeding is used to “set” traits by the experienced breeder.
- Inbreeding “brings to the surface” all the good traits… as well as all the bad traits!
- Be sure you know what they are!
- This method is best left to the very experienced breeder!
- Inbreeding does NOT introduce anything into the line that is not already there.
- Inbreeding requires very selective selection in the inbred offspring.
Where to get help

- Start with Dr. Carmen Battaglia’s Seminar: *Breeding Better Dogs*
- He also has a great book and video available for purchase.
- Visit his website at: [www.breedingbetterdogs.com](http://www.breedingbetterdogs.com)

- The SCA would like to thank Dr. Battaglia and Dog News for allowing use to use some of his proven suggestions in our Breeders Education PowerPoint presentation.
Planning a Next Breeding?

- Complete questions a-l before you make the decision to breed. This exercise will help you evaluate your plan for the next bitch you breed.
- This is a self score effort on your part.
- Score yourself based on what you know about this breeding.
The Brood Bitch:

- a) Her littermates, how many __ males __ female __ If this is not known -5 pts
- b) Her conformation – Complete a Stick Dog Pedigree on this bitch. How much missing information was there in three generations? This is a good indicator of what you know about her. +15 pts
- c) Her health history – Complete a Symbols Pedigree on the bitch to be breed. If completed, did you miss anything about her littermates (see "a" above) +15 pts
- d) List her strengths based on the breed standard. Use the Stick Dog Figure colors as your measure.

Maximum +25 pts

- e) List her weaknesses. These are the areas of conformation you would like to improve. Again this is based on the breed standard and how you colored her stick figure. Maximum + 10 pts

This bitch __ linebred +10 pts ___ inbred +10 pts ___ outcrossed –5 pts =_____ pts
The Stud Dog

● The Stud dog you are considering for the bitch above:
  ✓ f) His littermates, how many ___ males ___ female ___ If this is not known -5 pts
  ✓ g) His conformation – Complete a Stick Dog Pedigree on this dog. How much missing information was there in three generations? This is a good indicator of what you know about him +15 pts
  ✓ h) His health history – Complete a Symbols Pedigree on the dog to be used. If completed, did you miss anything about his littermates (see "a" above) +15 pts
  ✓ i) List his strengths based on the breed standard.
  ✓ Use the Stick Dog Figure colors as your measure.

● Maximum + 25 pts
  ✓ j) List his weaknesses. These are the areas of conformation you would like to improve. Again this is based on the breed standard and how you colored his stick figure. Maximum + 10 pts
  ✓ k) This stud is: ___ linebred + 10 pts ___ inbred + 10 pts ___ outcrossed – 5 pts

● l. Total the points for this breeding.
If you total is less than 100 points you do not have enough information.

This is a good time to remind yourself that more work is needed.

NOTE: To better prepare you to breed any dog or bitch you need to do the proper homework.

That includes pedigree analysis.

Go to www.breedingbetterdogs.com *

Click on articles, read “Selecting Sires”

"Bracket's Formula"
COLOR CHART — STICK DOG PEDIGREE

Sire ____________________________
Dam ____________________________

Whelped ____ / ____ / ____ Size of Litter ____ Males ♂ ____ Females ♀ ____

Actual | Predicted
--- | ---
#1 | ![Dog](Image)
#2 | ![Dog](Image)
#3 | ![Dog](Image)
#4 | ![Dog](Image)
#5 | ![Dog](Image)
#6 | ![Dog](Image)
#7 | ![Dog](Image)
#8 | ![Dog](Image)

Notes About Litter:

<table>
<thead>
<tr>
<th>COLOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st   -</td>
</tr>
<tr>
<td>2nd   -</td>
</tr>
<tr>
<td>3rd   -</td>
</tr>
<tr>
<td>4th   -</td>
</tr>
</tbody>
</table>
Symbols Method – Pedigree Chart

CODES
- clean
- affected
- died

Litter #

Notes About Litter:
● Now that we have structure we need to add type as well.
● Type is what makes the schipperke different from any other breed.
● The standard says the silhouette and coat is what makes the schipperke a schipperke.
● Now it’s time for You to be the Judge!
You Be The Judge

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**Silhouette**

Dog A, Dog B or Dog C?
Which one of these three male Schipperke comes closest to representing the correct silhouette for this Non-Sporting breed? The revised Standard calls the Schipperke silhouette “unique.” All three of these silhouettes conform to this uniqueness but only one is correct. Which one?

A judge who has assessed Schipperke for fifty years stressed that the most important thing in judging this breed is the correct silhouette: “I first look to see if the dog has the correct silhouette. If not, he is nothing and I look no further. If he has, I look into further details beginning with bone structure.”

The American Schipperke Club members on page 1 of *The (draft)Schipperke, An Illustrated Guide* 1998, compliment Anita Fredrick’s drawings with the advice to judges: “The distinctive silhouette and coat pattern are the things that set the Schipperke apart from other breeds. These are very important when judging the Schipperke.” The coat pattern will be discussed later in detail. For this scenario the coat pattern can be said to be correct for all three of these dogs, however, only one possesses a correct, balanced Schipperke silhouette. Which one?

Proportions
The difference between these three examples is one of proportions (and height). For the silhouette to be correct a Schipperke must have a certain ratio of body length to height and body depth to leg length. The Standard advises that the Schipperke is “square in profile” and “cobby.”
In the 1959 Standard the body is described as cobby and in the 1991 Standard it is the complete dog that is described as cobby. Frank Jackson in his Dictionary of Canine Terms 1995, defines cobby as, "compact, squarely built, short bodied." Two of these dogs are squarely built, only one of the three can be considered compact. Dog B is long in body, Dog C is high on leg, Dog A is just right.

**Size**

The American Schipperke's size was measured in pounds (12 to 18) until 1991. Now it is measured in inches (11-13 inches for males, 10-12 for females). It is assumed a 13 inch male would weigh 18 pounds. Several breeders recommend instituting a height disqualification because the breed is leaning towards large. In turn some breeders would like to see the heights raised because the larger better quality Schips are going to pet homes, and the smaller, poorer quality Schips are the one being exhibited. Still other breeders believe that changing from pounds to inches will encourage the promotion of larger dogs. The Standard wisely includes the rider, "Quality should always take precedence over size."

**Substance**

Quality includes substance. The Standard describes substance as "thickset." Breeders are concerned that with the emphasis on height chunky bodies are being lost. "The chest should be broad and deep." If Dog B's body was broad and deep and Dog C's wasn't, would you put long Dog D second?

**Let's Pretend**

Let's pretend you are on an ad hoc Illustrated Guide committee. You are presented with a photograph of question marked Dog D and an artist's see-through drawing of the same dog. Your task is to determine if this is the correct substance, outline and proportions that you would like to encounter during a hands-on examination - or to see if the skip was a short coated breed. Both the previous and the revised Standards are available. It might be helpful to compare the two.
Head - Muzzle

A short neck has been changed to a neck of moderate length. The word back has been changed to topline which is level or sloping slightly from the withers to the croup. The loin is now short and moderately drawn up rather than well drawn up. The croup is broad and rounded with the tail docked. No tail is visually discernible. ("Rump" well rounded has been deleted).

The chest is broad and deep and reaches to the elbows. The well sprung ribs in the form of a modified oval are wide behind the shoulders and taper to the sternum. The forechest extends in front of the shoulder between the front legs.

The shoulders are well laid back, the legs are straight viewed from the front. From the side the legs are placed well under the body (which suggests a sloping upper arm of good length). Pasterns are short, (did you notice Dog C’s were long?) thick and strong but still flexible, showing a slight angle when viewed from the side. Feet are round, small and tight. The hindquarters appear slightly lighter than the forequarters but are well muscled and in balance with the front. Extreme angulation is to be penalized. (Did you notice Dog B’s second thigh was long?)

Rear dewclaws must be removed. “Must” is a strong word. It is assumed that left on they could interfere with movement and the Standard is addressing breeders, however judges who are aware that the presence of hind dewclaws disqualify a Kerry Blue Terrier may wonder about the word “must.”

Skull

National descriptions differ: England has always to my knowledge described the skull as, "...flat, with little stop." America takes a different (revised) view, "...seen in profile with the ears laid back, the skull is slightly rounded." Canada not to be outdone (and I can imagine my fellow countrymen sitting as a committee debating the issue) came up with, "...when the ears are up in the alert position, the correct skull in profile will appear flat." All three are probably describing the same skull.

Muzzle - Fig 1 Or Fig 2?

All three countries describe the ratio of length of muzzle to skull differently. England uses the non committal word “moderate” to describe muzzle length. Canada sees muzzle length as, "The length of muzzle from tip to stop is equal to the length of skull from the stop to the occiput," (which I believe is wrong). America prior to 1991 described the Schips muzzle as, "...not too elongated..." but in 1991 changed the description to read, "The length of the muzzle is slightly less than the length of skull."

The English head could be either Fig 1 or Fig 2, but based on my photograph collection of British Schip heads Fig 2 would be more correct. The American Schip muzzle to skull ratio is about 3 to 4.
revised Standard has some interesting changes. The eyes are still small, oval and dark brown but added is the fact that they are placed forward (not on the sides). The ears are still small, triangular and placed high on the head, however, instead of very erect the ear is now very erect when at attention. A drop ear or ears is now the way the Standard describes this disqualification. Unlike the Skye Terrier's (drop variety) ears which hang flat against the skull, I believe the intent is to include any form of drop that departs from an erect prick ear. The description of bite has been greatly improved to read that the bite must be scissors or pincer and that any deviation is to be severely penalized.

Dog E Or Dog F?
Perhaps due to the Schip's profuse coat poor fronts and rears may be more visually difficult to recognize. Dog F may look balanced by itself but compared to superior Dog E the forward position of his forequarters and hindquarters suggest that both front and rear are steep.

The SCA is aware of the angulation problems this breed has and the revised Standard asks that the shoulders be well laid back and that from the side the front legs be placed well under the body well under is the traditional way of asking for a good length of upper arm sloping rearward. This places the elbow a proper distance back from the forechest. The Standard now wisely mentions that the Schip should have a forechest and a slight slope to the short front pastern. In the rear the hocks should be well let down (short rear pasterns) and the stifles be well bent. (From the side a line dropped down from point of buttocks should line up with the front of the rear pasterns). Dog E exhibits these virtues, Dog F does not, and the structure of each is reflected in the manner in which each moves.
Gait

Movement at the trot coming and in profile is described in the revised Schipperke standard in part as smooth, well coordinated and graceful. This was not the action the late Curtis M. Brown and I found during the period in the mid 1980's when we were describing and illustrating the distinctive manner in which many breeds moved for the book *Dog Locomotion and Gait*. After studying slow motion films of numerous Schips trotting in profile we came to the conclusion that the Schip moves in an energy wasting manner.

**Dog F**

What we saw on foot after foot of film taken at all-breed and specialty shows was a diminished rearward action of the hind leg, the rear pastern seldom extending beyond the vertical. We assumed that the desire to select for a "well rounded rump" (since changed to "well rounded croup") had apparently altered the structure of the Schip's hind leg in such a way that the hind leg lifted wastefully high as it reached forward under the body and did not extend rearward much beyond the vertical on the follow through.

To compliment this locomotion departure (retain foot coordination) the front leg lifted wastefully high as it reached forward (very little bend at wrist) and rearward due to a short upper arm there was very little flex to the front pastern on the follow through. The action was rapid and mechanical.

**Dog E**

Fortunately we did not publish our findings. If the filming was done today the conclusion drawn would be quite different. Today Schip movement in profile is much improved as exhibited by
Double Tracking – Coat Pattern

Dog E: All four legs reach forward and extend rearward an equal distance. The front paw flexes on the follow through under the body and the hind foot slips neatly under it to occupy the spot vacated by the front foot. Previously often absent, the hindleg now extends rearward well beyond the vertical on Schips deserving of championship points.

Dog E Coming

This line drawing is intended to illustrate the correct "double tracking" action the Standard asks for (the hind legs directly behind the front legs), "with a tendency to gradually converge toward the center of balance beneath the dog as speed increases."

Dog F Coming

When the upper arm departs toward short and steep and the chest is the required "broad and deep," the forelegs often move wide, the same distance apart at the feet as at the elbows. The hind legs on this dog have not followed suit, instead they have correctly converged producing four tracks rather than two. For a time this wide in front - closer in rear kind of action was so prevalent that it was considered by many people to be correct for the Schip.

Coat Pattern Dog G

The Standard advises that the adult coat is highly characteristic and must include several distinct lengths growing naturally in a specific pattern. The coat is short on the face, ears, front of the forelegs and on the rear pasterns: it is medium length on the body, and longer in the ruff, cape, jabo, and culottes. The ruff begins in back of the ears and extends completely around the neck; the cape forms an additional distinct layer extending beyond the rough; the jabo extends across the chest and down between the front legs. The hair down the middle of the back, starting just behind the cape and continuing over the rump, lies flat. It is shorter than the cape but longer than the hair on the sides of the body and sides of the legs. The coat on the rear of the thighs forms colottes, which should be as long as the ruff. Lack of differentiation in coat length should be heavily penalized as it is an essential breed characteristic. I was informed by Maralyne Busse, SCA Judges Education Coordinator, that in recent years there has been a tendency towards a Shetland Sheepdog type coat that stands out all over. Wrong for the Schipperke, Continued on page 156.
**Texture**
The coat is abundant, straight and slightly harsh to the touch. (Its harshness has been compared to that of a Flat Coated Retriever or Welsh Corgi). The softer undercoat is short and dense on the body, and is very dense around the neck, making the ruff stand out. Silky coats, body coats over three inches in length or very short harsh coats are equally incorrect.

**Color**
The outer coat must be black. Any color other than natural black is a disqualification. The undercoat may be slightly lighter. During the shedding period the coat might take on a transitory reddish cast, which is to be penalized to the degree that it detracts from the overall black appearance. Graying due to age (seven years or older) or occasional white hairs should not be penalized.

**Trimming**
As the Schipperke is a natural breed, only trimming of the whiskers and the hair between the pads of the feet is optional. Any other trimming must not be done. I am informed that too many liberties are being taken with the coat. The Standard is adamant in this regard.
Thanks for Attending

We hope to see you next year in Oklahoma