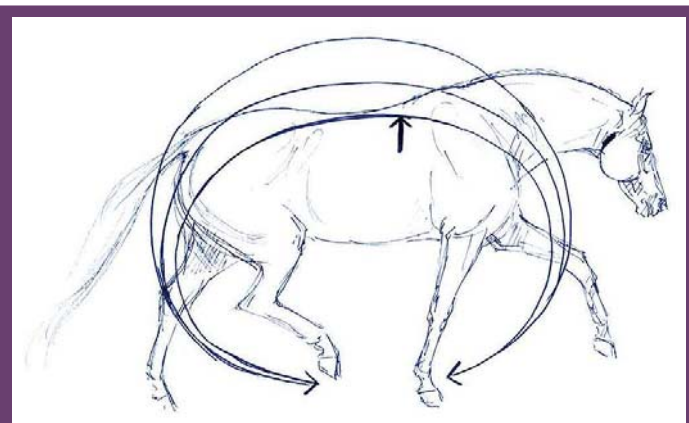




# ACF Riding Club



## Let's Get Physical

- Size, conformation and specific physical traits can help horses excel at certain activities, such as jumping, racing, endurance and heavy pulling.
- Bone structure is only part of the movement puzzle. Muscles, tendons, ligaments, conditioning and training all play a role in a horse's athletic prowess.
- Some movements, such as those of gaited horses and pacers, seem to be hard-wired into the brain.
- A long neck (one where the top is twice the length of the bottom) generally equates to a long stride.
- A short back is generally praised, but a moderately long back may actually be an advantage in a jumping horse.
- Pasterns are shock absorbers. Long pasterns provide a smooth ride, but too much length may weaken the leg.
- A horse's desire often supersedes his physical limitations.

mechanics, so breeding has created some strikingly different body types that somehow produce the movement most suited to those jobs.

Depending on how a horse earns its living, one horseman's view of "good proportion" may be another horseman's "inadequate" or "overdeveloped."

American Standardbreds and European Warmbloods are both known for their huge trots. But they are very different trots, and the two breeds have corresponding differences in appearance. It is not that one breed is

## The Magic and Mystery of a Horse's Movement

There are horses that seem to be built by the angels to clear high buildings in a single bound who simply don't enjoy jumping. There are horses who carry the blood of cutting horse royalty that prefer being trail horses. Usually, however, horses are at their best and happiest when doing jobs that are physically easy for them.

How a horse is built can make specific jobs easier or harder for him to do.

Physics dictates that there are certain gold standards regardless of breed. Legs viewed from the front should always be straight so they can support half a ton or more of moving animal atop a few inches of bone. Deep chests and well-sprung ribs maximize lung capacity. And all the parts should be "in proportion."

There is, however, a good reason why illustrations of "ideal" horse conformation are always drawings, not photographs. If you go purely by written descriptions, most horses should look pretty much the same.

But horses have been bred for specialized jobs for thousands of years. Different functions require different body

“right” and the other is “wrong.” One is bred for efficient speed. The other is bred for suspension—the stately, gravity-defying power to “float” in the air at mid-stride.

So why does a Fox Trotter amble rather than jog, a Quarter Horse jog rather than extend in that floatingly powerful trot, and a Warmblood extend rather than amble? On a practical, everyday basis, what should you look for to find a pleasure horse that is an actual pleasure to ride, or a jumper with “promise”? If you already have a horse, is he suited for what you are asking, or is his training always going to be a battle against his physical limitations?

A horseman’s “eye” improves by looking at the conformation of a lot of horses and carefully observing what works and what does not. So let’s take a look at many types of horses and see what makes them tick.

## Body Parts

A horse balances his body mass with his head and neck. The size, the manner in which the head connects with the neck, and the way in which the neck sets into the body help determine the horse’s balance, natural carriage, and way of responding to the bridle. A thick throttle or narrow jaws can inhibit the way the horse carries the bit. That may be vital in some disciplines and irrelevant in others.



Long necks favor long strides because the long muscles of the neck help draw the foreleg forward. Defined here, a long neck is one in which the top is longer than the bottom by a ratio of 2:1. Shorter necks = shorter neck muscles = shorter strides. A low-set neck can result in a horse that moves more on the forehand. A higher-set neck makes collection and high action easier.

Withers should lie well back, be clean, and be of moderate height. A truly balanced horse actually gives an appearance of sloping very slightly downhill from the front of the withers to the croup.

Low withers provide less space for the back and neck muscles to attach. They are associated with short, stubby gaits and (yes, again) moving on the forehand. High, sharp withers may simply be caused by a lack of muscle development, but they may also show shoulders that are short and steep. Mutton withers (flat or buried in fat) along with broad, fat, “loaded” shoulders often go with a short, thick neck and a broad chest. This tends to make the horse ride more heavily and may also cause a tendency for him to roll a bit from side to side. On the bright side, he’s probably an easy keeper.

The back is the “transmission” between the hindquarters and the forehand. It is considered to be long or short as measured from the top of the withers to the point of the croup.

In a well-balanced horse, this “topline” should be half of the “underline,” which is the distance between the point of the elbow to the stifle. (There’s that 2:1 ratio again, but neatly reversed as to top and bottom.)

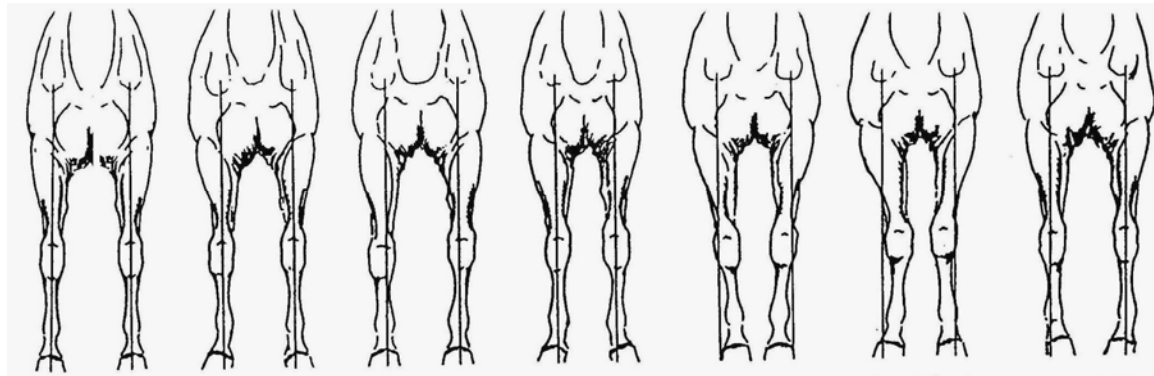
A long back makes it more difficult for a horse to collect himself and shift his balance, but some length seems to favor jumping “scope”—the ability to jump high, wide and handsome. A short back usually means a handy horse, but some very short-backed horses are not as smooth or springy in their movement as are longer-backed horses.

A horse’s backbone does not really bend much, if at all. It is actually the lumbar-sacral joint, or “coupling,” that flexes, letting the horse get its hind legs under its center of gravity in a spectacular jump takeoff or

reining sliding stop. To have a strong lumbar region, the loin should be broad, strongly muscled, and not too long. The coupling and croup should be well-muscled and slightly rounded.

Pasterns absorb shock. Their length and angles are a balancing act, with “medium” being the key concept.

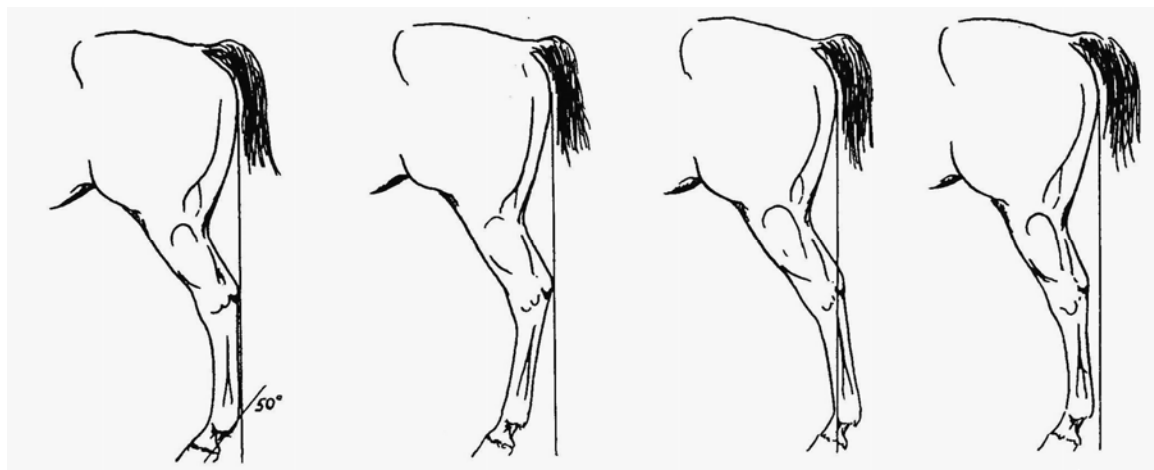
A longer, more sloping pastern will give a smoother ride, but a very long, very sloping pastern is more prone to breakdowns. A shorter pastern is stronger, but does not absorb shock as well. An upright pastern produces rougher gaits. The combination of a short, upright pastern is not desirable for the rider’s comfort or the horse’s long-term soundness.



Front pastern angles are usually similar to that of the shoulder. Hind pasterns are usually somewhat more upright than the front ones, but should still be of medium length and slope.

Hindquarters are the horse’s engine. If the pelvis is long and the hindquarters are deep and wide, the large hindquarter muscles will be long and well-developed, enabling the horse to move with more power.

The hind legs are levers that move the horse. A long line from the hip to hock permits a long stride and lets the horse get his leg more fully underneath his body for better balance and agility. This goes with short hind cannons and hocks that are closer to the ground, which also produces more power. Longer hind cannons favor higher action, but are not as strong.



Excessively straight hind legs, called “post legs,” engage by swinging forward with little flexion. This tends to be good for speed, but makes collection and “sitting on the hocks” difficult. Sickie hocks are always slightly bent. They place the hind leg slightly forward under the body, but are also prone to strain.

The alignment of front and rear legs should be straight and symmetrical. In the hind legs, cannons should be vertical and parallel, but the stifles and toes normally point somewhat outward (preferably at the same angle) so they can efficiently reach under the horse's belly. Hind legs close together, but with cannon bones vertical and parallel, places those hind legs more nearly under the horse's center of gravity and may contribute to better balance. This should not be confused with cow hocks, a defect where the hocks point inward while the cannon bones angle outward.



Learn how the breed of your horse affects his or her own movements.

### Movement Types

Susan Harris, author of *Horse Gaits, Balance & Movement*, defines six types of movement for horses. Each movement of the horse has its benefits or drawbacks, depending on what the rider is hoping to do with the horse.

- 1. Long, Low Movement** is also known as “daisy cutter” action in the hunter ring. These horses swing their legs forward from the hip and shoulder in a sweeping, forward movement with little bend in their knees or hocks. This is efficient for speed on the racetrack or for galloping across a hunt field, but tends not to produce the tight folding of the knees and hocks for efficient jumping and makes the extreme collection or suspension required of upper level dressage more difficult.
- 2. Short, Low Movement** is also called “flat-kneed” action by western pleasure riders. It also shows little flexion at the knees and hocks, but with a shorter stride than the daisy cutter. These horses can be very comfortable for the rider, but, as with the long, low movement, they may be at a disadvantage in the hunter/jumper ring or in an advanced dressage arena.
- 3. Medium Movement** shows long, ground-covering strides with more bend in the joints than either of the above. The strides have some arch and elevation, but are still long and flowing. This type of movement may show brilliant extended gaits and can achieve good collection as well, but the more that joints bend, the more forward speed decreases. This movement is typical of European Warmbloods, but may also be found in some Arabians, Morgans and other breeds.
- 4. Round Movement** has rounded strides with forward reach and equal bend in the knees and hocks. This movement is both ground-covering and upward, but not extreme. It is typical of Morgans and some other pleasure riding/driving horses.
- 5. High Action** is elevated with great animation and energy. The horse moves with higher head carriage and marked flexion of the knees and hocks. The forearms may be brought up past the horizontal. Both front and back legs fold tightly. It is typical of Hackneys, American Saddlebreds, and park horses of other breeds in which the movement is more up and down than forward.
- 6. Baroque Movement** has high, round, elastic strides. The joints of the leg are flexed more than in medium movement, although not to the extreme of high action. It is seen in Iberian breeds, such as Lippizzaners and Andalusians. In Harris' words, “These horses are born to dance.” They are gifted for highly collected dressage movements, but though they may indeed dance superbly, they are generally not designed for the racetrack.

“Gaitedness” (Running Walk, Rack, Amble, Fox Trot, etc.) seems to be more a function of inherited neurology than it is of physical conformation. Essentially, the horse’s brain is hard-wired to move its legs at a different rhythm and sequence than its trotting cousins.

These gaits can be extraordinarily comfortable to sit because at least one hoof is on the ground at any given time. The lack of suspension, during which all four feet are simultaneously airborne, minimizes back (and, hence, rider) movement. As with a horse of any breed, physical factors such as the length and shape of the croup, pasterns, hock set, etc., may make the gait better or worse, just as proper or improper training will improve, impede or even ruin the movement.

## Muscling In

Some muscle types are typical of specific breeds, but inherited muscling alone is not sufficient to enable a horse to do a specific job.

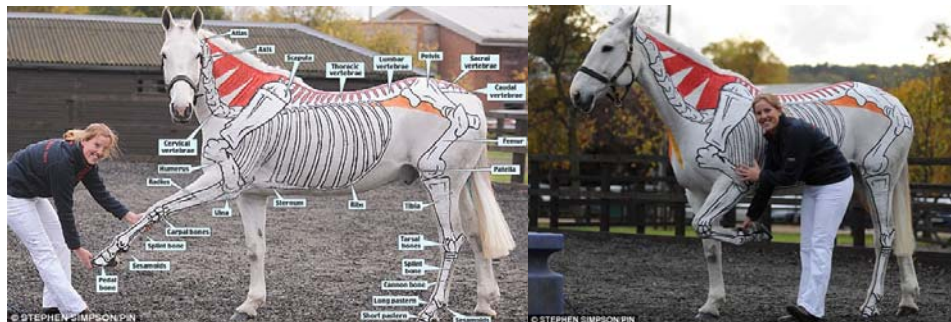
Arabians and Thoroughbreds have long, lean muscles that work efficiently with their cardiovascular system to produce a potentially efficient endurance machine. The tendons and ligaments, however, still must be conditioned to withstand the demands of covering many, many miles and/or great speed, and the underlying bone structure must be able to support what the body is doing.

A working Quarter Horse might be born with shorter, heavier muscles that allow it to make the lightning starts, stops and turns necessary in dealing with cattle. But again, both structure and conditioning are necessary to prevent injury.

One of the benefits of regular, correct training for any breed is that muscles of any type can be maximized and tendons and ligaments can be strengthened and made more flexible through regular and proper work. The result is purer motion, greater soundness, and a substantial, often gratifying change in the appearance (although not the underlying bone structure) of the horse’s conformation.

Conditioning and training, however, can only do so much to improve a horse. A horse with short legs and a long back will not move with long, flowing strides. A horse that is built heavily in front and lighter and/or higher behind has more difficulty shifting his center of balance onto his hindquarters and is likely to move “on the forehand,” with more of his weight and concussion from movement concentrated on his front legs.

Story by Tracey Emslie – My Horse.com



Gillian Higgins - With 205 bones and 700 muscles the horse is a challenging animal for anatomy students to study. Ms Higgins uses water-based hypoallergenic paints which are easy to wash off afterwards. Source:<http://www.dailymail.co.uk>

## A Horse's Vision



Most of the time, a horse has "monocular" vision. This means a different image is seen by each eye so that a horse is seeing two different pictures at the same time. A horse can also have "binocular" vision. Binocular vision is when both eyes work together to see one picture (humans have binocular vision). A horse only has binocular vision when it is looking down its nose.

A horse has a wide range of vision. A horse can see completely around its entire body except for small blind spots directly in front of its face, underneath its head, and directly behind itself. This is why it's very important not to walk up right behind a horse - you are in its blind spot and if you startle it you may get kicked.

Blinkers restrict the horse's vision to the rear and, in some cases, to the side. Many racehorse trainers believe they keep the horse focused on what is in front of him, encouraging him to pay attention to the race rather than other distractions, such as crowds.

Most of the time, wherever a horse's ear is pointing is where the horse is looking with the eye on the same side. If the ears are pointing in different directions, the horse is looking at two different things at the same time. There are exceptions to this. For example, if a horse has its ears pinned back against its neck in anger, this does not mean it is looking backwards with both eyes.

A horse can see better at night than a human. However, it takes a horse's eyes longer to adjust from light to dark and from dark to light than a human's.

The eyes of a horse are larger than most other animals', and they can move independently, giving the horse a shallow panoramic vision. Because its lenses are inflexible, a horse will focus on an image by moving its head to direct light rays to the central part of the retina. Horses can also see in color.

The horses' field of vision is 320 degrees. And with a slight head turn in each direction, its 360 degrees. A horse approaching a jump cannot see it when he gets within 4 feet of it.



(1) Blue areas show where a horse has monocular vision. (2) Green areas show where a horse has binocular vision.

Vision Source: cowboyway.com

# THE EQUINE ~ Horse