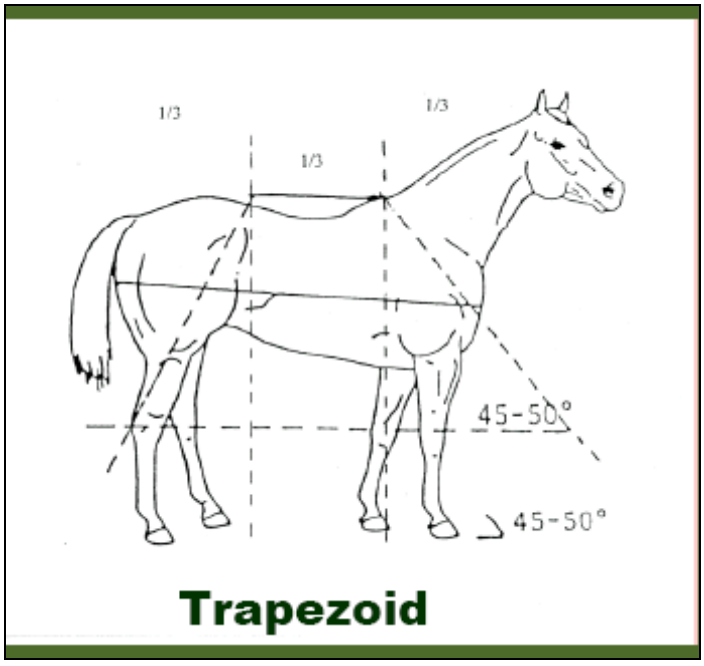
Middle California Region
Upper Level Horse Management Education

Conformation Analysis

By Claudia Deffenbaugh

Horse conformation refers to the correctness of a horse's bone structure, musculature, and its body proportions in relation to each other. Undesirable conformation in a horse can limit its ability to perform a specific task. Although there are several universal "faults," a horse's conformation is usually judged by what its intended use may be. Thus "form to function" is one of the most important considerations in judging conformation. A horse with poor form for a Grand Prix show jumper could have excellent conformation for a World Champion cutting horse, or to be a champion Draft horse. It is also important to remember that *every* horse has good and bad points of its conformation, no horse is perfect, and many horses (including Olympic caliber horses) excel even with conformation faults. **Remember attitude and heart are at least as important as any perceived ideal conformation.**

To start: Look at the horse's overall proportion. Is it pleasing to the eye? Whether he is small or large – he should look in balance. Look at the horse from the front, the side and the back to evaluate his conformation. Have someone walk the horse toward you, away from you and past you. Repeat it at the trot.



Evaluate the horse in the following order:

To judge balance – square up the horse on concrete- look to see if he appears to be going down hill. Are hocks and knees at the same height?

The Horse's Overall Balance and Bone

Insufficient Bone: Measuring the circumference of the top of the cannon bone, just below the knee, gives an estimation of the substance. Ideally a 1,000 lb horse should have 7-8 inches. Insufficient is less than 7 inches for every 1,000 lb of weight. A horse with insufficient bone is more at risk for injury (within the bones, joints, muscle, tendons, ligaments, and feet). Repeated impact creates soundness issues, especially in those sports with a lot of concussion (jumping, galloping, racing, long distance trail). Track horses get bucked shins, event and trail horses get strained tendons and ligaments.

Light-Framed/Fine Boned: Substance of long bones is slight and thin relative to the size & mass of the horse. Especially noticed in the area of the cannon & pastern. Affects the longevity of performance horses. Doesn't provide ample support for bulky musculature & there is a lack of harmony visually. Theoretically, a lighter frame reduces the weight on the end of the limbs, making it easier to pick up the legs & move freely across the ground. However, with a lot of speed & impact work, light bone suffers concussion injury, leading to bucked shins, splints, & stress fractures. Tendons, ligaments, & muscles have less lever system to pull across to effectively use or develop muscle strength for power & stamina.

Course-Boned/Sturdy-Framed: Long bones are big, wide, & strong in a horse with either light or bulky muscled appearance. Advantageous for any sport, the horse tends to hold up well. The horses tend to be rugged and durable, capable of carrying large weights relative to size. Big, solid bones provide strong levers for the muscles to pull against to improve efficiency of motion, thus minimizing the effort of exercise & reduce the likelihood of fatigue, contributing to endurance. May add mass to each leg, and consequently slightly hinder speed at the gallop when flat racing.

Withers Higher than Croup: The peak of the withers is higher than the peak of the croup when the horse is square. Saddle tends to slide back to the loins, moving the rider's center of gravity back, so it is hard to maintain posture & balance. The back & loins may become sore. The girth may interfere with the capacity for breathing. Use a breast collar if this happens. The horse puts more weight on the hind end, so there is a greater risk of strain on the joints & ligaments of the hind legs, especially the stifles.

Withers Lower than Croup/Rump High/Downhill Balance: The peak of the croup is higher than the peak of the withers. This is less desirable than a horse with higher withers. Young horses are usually built this way. More weight is placed on the forehand, reducing the front-end agility. Muscles must work harder to lift the forehand, leading to muscular fatigue. It is difficult to raise the forehand at the base of a jump for liftoff. At speed, more work of loins, back & front end is needed to lift the forelimbs. Increases concussion on the front legs, so the horse is at greater risk of front-end lameness. Greater jar on the rider. Tends to throw the saddle & rider toward the shoulders, leading to chaffing, pressure around withers, & restricted shoulder movement.

Head and Neck Conformation:

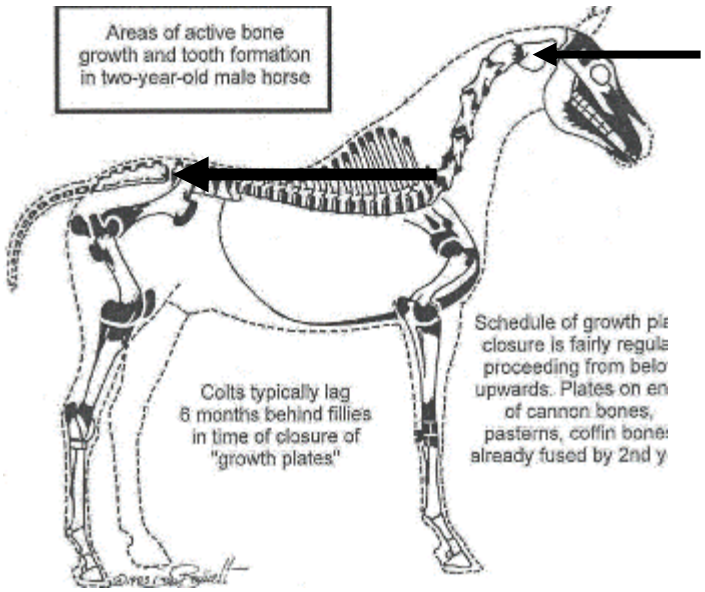
The Head and Neck:

The ideal head varies dramatically from breed to breed, but all breeds are valued for a relatively broad forehead. A broad forehead provides increased sinus capacity, thus there is more room for air exchange through the air passages, and a large surface area for facial muscles that assist in opening the nostrils for air flow. A good head in any breed must also have large eyes, proportionate ears, large nostrils, good width between the jaws, and a smooth joining of the head to the neck. A wide jaw or "throatlatch" allows more than 4 fingers between jaw bones (greater than 7.2 cm wide) A wide throatlatch may make a head appear less flexible, but really it has no effect on the horse accepting the bit and does not restrict air flow. The horse is good for any activity. The ability to breathe deeply is critical to the success of a horse in any endeavor; hence any conformation flaw that restricts breathing capacity is a fault across all breeds. Some types of heads that distinguish between breed types: Dished face (Arab); Roman Nose (draft and some warmbloods from draft ancestry.

The ideal neck is proportional to the horse's body, about 1/3 horse's length, measured from poll to withers, with a length comparable to the length of the legs. The shape of the neck and its joining to the head is of some importance but not great. Need flexion at the poll.

Compare the back of the jaw and the top of the neck – there should be a good distance and the bony shelf almost horizontal.

The most important part of the shape of the neck from a functional standpoint is the shape of the lower curve. If the lower curve is short and shallow (the base of the neck is set high on the chest) the horse will be easy to train and ride. The hardest horses to train are those where the base of the neck is set lowest on the body (ewe necked). The easiest horses to train are those in which the neck bones at the base of the S curve are not that far below the center of the back**. Draw a straight line from the center of the U straight back. It should be 1 inch below the center of the back bones. Run your hands from the top of the neck (atlas vertebrae) down and follow the bones. Ask the question. Does the horse have a good neck structure or set on too low or high?**



Dished Face: Concave undulation or "dish" beneath the eyes that is further exaggerated by a slightly bulging forehead "jibbah". If extreme, can limit the airflow through the nasal passages and thereby limit performance but moderate dish has no adverse effect. The Jibbah can provide for larger sinuses in the forehead and therefore more room for air exchange through the sinus passages. It also can provide a broader platform for the muscles that assist in opening the air passages.

Small Nostrils: Opening of the nostrils (the nares) is narrow and somewhat restricted, limiting ability to expand the nostrils for breathing while working hard. Often seen in horses that also have narrow jaws and muzzle.

Narrow throatlatch/Narrow Jaw: To estimate the width of the jaw, touch the skin of the horse's neck with the back of your hand, the slide your flexed fingers forward between the wings of the jawbones, using the finger joint closest to the knuckles of your fist to measure. A jaw is considered narrow if this width measures less than 4 joints wide or less than 7.2 cm ($2\frac{5}{6}$ in) (average for Thoroughbreds). A narrow throatlatch may restrict airflow. A horse with a narrow throatlatch may suffer from restricted upper airway or air turbulence due to paralysis of recurrent laryngeal nerve (RLN). Horses with this paralysis of one or both cartilages make a roaring sound when working at fast speeds because cartilage collapses into airway space. This causes exercise intolerance, and may lead to stops at a fence due to muscular fatigue. Airway turbulence is also thought to be associated with "bleeders" (exercise induced pulmonary hemorrhage-EIPH) A dressage horse or horse to go on the bit in a collected frame may be resistant to do so because flexing at the poll further narrows the airway.

Wide throatlatch/Wide Jaw: The throatlatch has sufficient space between the jaw bones allowing more than 4 finger joints to comfortably fit and measuring more that 7.2 centimeters. The broad area of the jaw provides a large surface area for the insertion of the neck muscles that control balance and rapid movement changes of the body. There should be no air flow restriction no matter what position the horses head is in.

Mouth: Look for parrot mouth, sow mouth, wry mouth, age horse (see teeth presentation)

Short Neck: A neck that is less than 1/3 the length of the horse. A short neck is often quite flexible despite appearing thick and muscular and the function and range is rarely altered. May be slightly less flexible at the poll, but the horse's maneuverability and agility is generally not affected. It does not shorten stride length, which has more to do with shoulder slope. The horse may not excel at jumping high obstacles or galloping at high speeds, and may not be as handy at quick directional changes.

Long Neck: A long neck is a neck is one that is much more than the length of the horse's body. And is considered too long when it approaches 1 ½ x's the horse's body length. An overly long neck adds weight to the forehand, allows the horse to bend its neck into an S curve, and sometimes is associated with Wobbler's syndrome.

Excessively large/fallen crest: The horse has an overly large crest that may fall to one side in extreme cases. It is usually from fat deposits above the nuchal ligament in an obese horse. Places more weight on the forehand. (More common in ponies, draft breeds, stallions and Morgans).

Bull Neck: The horse has a short, thick, and beefy neck with short upper curve. The attachment to its body arises beneath a point half-way down the length of shoulder. (Draft, Quarter Horses, and Morgans). Good for pulling power and collar placement in a draft horse. A riding horse has a harder time maintaining balance if rider heavy or off-balance.

Ewe/ Upside-down Neck: Poorly muscled across the topline with a noticeable dip just in front of the withers while the muscles on the bottom are bulging and over muscled. (Upside down neck, "stargazers").

Stargazing makes it difficult for rider to control the horse, who then braces on the bit and is hard-mouthed. A ewe neck is counter-productive to collection and proper transitions, as the horse only elevates head and doesn't engage its hind end. The horse's loins and back may become sore.

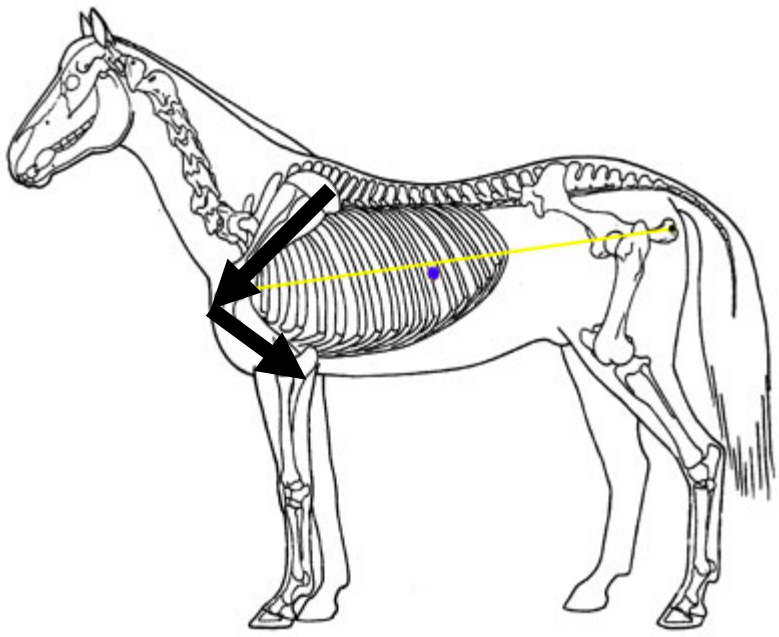
Swan neck: The horse has a neck set at a high upward angle, with the upper curve arched, yet a dip remains in front of the withers and the muscles bulge on underside. (Saddlebreds, Gaited horses, thoroughbreds). A swan neck makes it easy for a horse to lean on the bit and curl behind without lifting its back. Can make it easier for the horse to lift his head and trunk with a more floating comfortable canter.

Arched/turned-over neck: The crest is convex or arched with proportional development of all muscles. This is an ideal neck. The neck carries well back over the withers and appears as though the neck flows out of the horse's back.

Knife-necked: long, skinny neck, with poor muscular development on both the top and bottom. Gives the appearance of a straight crest without much substance above or below. It is usually associated with poor development of back, neck, abdominal and haunch muscles, allowing horse to go in strung-out frame with no collection and on the forehand. It is often rider-induced, and usually indicates lack of athletic ability

Horizontal neck: The neck is set on the chest neither too high nor too low, with its weight and balance aligned with the forward movement of the body. Although relatively uncommon, it is usually seen in Thoroughbreds, American Quarter Horses, and some Warmbloods. Advantageous to every sport, as the neck is flexible and works well for balancing

Conformation of the chest, shoulder, and forearm



The angle should be at least 90º for good free movement.
Length of arm bone (humerus) must be at least ½ of the shoulder blade (scapula).

Straight, upright, or vertical shoulder: The shoulder blade, measured from the top of the withers to the point of shoulder, lies in an upright position, particularly as it follows the scapular spine. Often accompanies low withers. The horse has shorter muscular attachments that thus have less ability to contract and lengthen. This shortens the stride length, which requires the horse to take more steps to cover ground, and thus causes a greater risk of injury to structures of front legs and hastened muscular fatigue. An upright shoulder may cause a rough, inelastic ride due to the high knee action. It increases concussion on front limbs, possibly promoting the development of DJD or navicular disease in hard-working horses. The stress

of impact tends to stiffen the muscles of the shoulder, making the horse less supple with a reduced range of motion needed for long stride reach. An upright shoulder causes the shoulder joint to be open and set low over a short, steep arm bone, making it difficult for horse to elevate its shoulders and fold its angles tightly, which is needed for a good jump and in cutting. Thus the horse usually does not have good form over fences. The horse is usually easier to accelerate in sprinting.

Laid-back or sloping shoulder: The horse has an oblique angle of shoulder (measured from the top of the withers to the point of shoulder) with the withers set well behind the elbow. Often accompanies a deep chest and high withers. The horse has a long shoulder blade to which attached muscles effectively contract and so increase the extension and efficiency of stride. It distributes muscular attachments of the shoulder to the body over a large area, decreasing jar and preventing stiffening of the shoulders with impact. The horse has an elasticity and free swing of its shoulder, enabling extension of stride that is needed in dressage and jumping. A long stride contributes to stamina and assists in maintaining speed. The longer the bones of the shoulder blade and arm, the easier it is to fold legs in tuck over fences. The laid back scapula slides back to the horizontal as the horse lifts its front legs, increasing the horse's scope over fences. A sloping shoulder has better shock-absorption and provides a comfortable ride because it sets the withers back so rider is not over the front legs.

The Humerus (arm bone)
The arm bone is from the point of shoulder to the elbow, and its length dictates how tightly the elbow and lower joints can bend and reach for extension.

Long arm bone The humerus is long when it is 50-60% of the length of the scapula. The elbow is beneath the middle of the withers if the humerus is long. A long humerus increases movement of elbow away from torso, both forward and to the side, allowing more tucking over fences and increased stride in speed events. It provides a scaffold for lengthy muscle attachments of flexor and extensor muscles, which contract with greater force to increase power and speed.

Short arm bone: Humerus is usually in a horizontal position which closes the shoulder angle (shoulder and humerus) to less than 90 degrees. A short humerus decreases the scope of a horse, and contributes to a short, choppy stride. This increases the impact stress on front legs, especially the feet. The rider is jarred and the horse absorbs a lot of concussion. More steps are needed to cover ground, increasing the chance of front-end lameness. The horse tends to be less able to do lateral movements.

Narrow breast: With the horse standing square, the width between the front legs is relatively narrow. However, this can be skewed by how far apart feet are placed at rest. A narrow breast often represents general thickness and development of shoulder. A horse's ability to carry weight is dependent on the size of its chest, so a horse that doesn't do well with draft work but may be fine in harness or with light rider. Narrowness may be from turned-in elbows which can cause toes to turn out, that also causes the toes to turn out. Narrowness in the chest may be from immaturity, poor body condition, inadequate nutrition, or under-developed breast muscles from a long time in pasture and lack of consistent work. The horse usually has undeveloped shoulder and neck muscles. The horse may tend to plait, and is more likely to interfere, especially at the trot.

Pigeon-breasted: The front legs come too far back under the body, giving a bulky appearance to the breast as viewed from the side. The front legs lie behind a line drawn from the withers to the ground, setting the horse under himself. It is often associated with a long shoulder blade that drops the point of shoulder somewhat low with the arm bone relatively horizontal, setting the elbow more to the rear. Bulky breast muscles and legs set under the body decrease the efficiency of stride and swing of shoulders, thus hastening fatigue. It may interfere with the front legs, forcing them to move to the side rather than directly under horse. Causes a “rolling” gait that slows the horse’s speed, especially at the gallop.

Long forearm: The length of the radius (between elbow and carpus) is long. A long forearm is desirable for any performance activity, especially if the horse also has a short cannon. It increases the surface area and length of muscular attachments to gain best leverage for maximum stride length and speed. Good muscling of a long forearm is especially advantageous to jumping horses, as the strong forearm muscles absorb concussion from the impact and diffuse the strain on tendons and joints on landing.

Short forearm: The distance of radius from elbow and carpus is proportionately short. The length of stride is dependent on the forearm length and shoulder angle, so a short forearm causes horse to need to increase the number of steps to cover a distance, increasing overall muscular effort and hastening fatigue. Increases the action of the knees, giving an animated appearance. Knee action is not compatible with speed.

Body: Withers, Back, Loins and Croup

Mutton withers: The horse has flat and wide withers, from short spines projecting off the 8th-12th thoracic vertebrae. The withers are an important attachment for ligaments and muscles that extend head, neck, shoulder, and back vertebrae, and are also insertion point for muscles that open ribs for breathing. If mutton withered, the horse has less range of motion when extending the head and back muscles, so is less able to elevate its back with its head and neck extended, which affects ability for collection. Difficult to hold on saddle. If saddle slides forward, it can put weight on the forehand, interfering with balance and restrict the shoulder movement by saddle and rider movement, causing shortened stride, interfering or forging.

Hollow behind withers: A "shelf" behind the withers, gives a hollow appearance, often created by lack of muscular development. Usually found in high-withered horses of any breed. Often implies a less-developed muscular bed for the saddle to rest on. The saddle will often bridge in this area to pinch the withers, creating soreness of the withers and muscles. The horse is then less willing to move out, extend the shoulders, or use its back, especially for speed or jumping. It also prevents a horse from true elevation of the back needed for collection.

High withers: The 8th through 12th thoracic vertebrae are long and angle backward to create steep, high withers. (Thoroughbreds, Saddlebreds, and some Warmbloods).High withers provide a lever for the muscles of the back and neck to work together efficiently. As the head and neck lower to extend, the back and loin muscles correspondingly shorten or lengthen. The backward angle of withers is usually associated with sloping shoulders, which provides good movement of the shoulder blade. This makes it easy for the horse to engage in collection, lengthen, round its back for jumping, or extend its shoulder for improved stride length and speed. If the withers are too high and narrow, there is a chance that a poorly fit saddle will impinge on withers and slip back too far, creating pain especially with the rider's weight. Performance and willingness will suffer.

Run your hands along the top of the back – you feel bumpity, bumpity – this is the horse's backbone. The bumps you feel are the top of the vertebrae. There is only skin between the vertebrae and your saddle and butt. Follow your hand along the backbone – there are no bones where the back meets the croup (the loin). This should feel elastic in a young horse this is the SEAT OF ATHLETIC ABILITY IN THE HORSE. The loin should be: tight, full, no dip and elastic. This area connects the pump handle (croup, rear end) to the back. Allows the horse to tuck his fanny and make his back come up. The distance from the last rib to the point of the hip is important in determining the strength and athletic ability of the horse. This area should be short (little distance from last rib to hip bone), wide from side to side (over the top), smooth and concave.

Roached back: the area where the back and loins join the croup (the coupling) there is an upward convex curvature of the spine. Often a result of a short back, or injury or malalignment of the lumbar vertebrae. Often accompanied by less-developed loin muscles in breadth, substance, and strength. The spine already "fixed" in a curved position, and the attaching muscles are unable to contract properly to round or elevate the back. Less flexible up and down or side to side. Thus it is difficult to engage the hindquarters or round the back by elevating loin muscles. Vertebrae often have reduced motion so the horse takes shorter steps behind.

Long back: With the back measured from peak of withers to peak of croup, exceeds 1/3 of horse's overall body length. The horse's ability to engage back depends on its ability to elevate the back and loins, requiring strong back and abdominal muscles. A long back is flexible, but harder for horse to stiffen and straighten spine to develop speed or coil loins to collect and engage the hindquarters to thrust rear limbs forward. It is difficult to develop a long back's muscle strength, so a horse is more likely to fatigue under the rider and to sway over time. Movement of the back is flatter and quieter, making a more comfortable ride and is easier for horse to change leads.

Short back: The horse's back measures less than 1/3 of overall length of horse from peak of withers to peak of croup .The back may lack flexibility and become stiff and rigid. If vertebral spines of back are excessively small, the horse may have difficulty bending and Flatter develop spinal arthritis. This adversely affects dressage and jumping performance. If still in back and torso, the stride will become stiff and inelastic. The horse may overreach, forge, or scalp itself if the hind legs do not move straight. The horse may be handy and agile, able to change direction with ease. If the horse has good muscling, it is able to support weight of rider with rare occurrence of back pain.

Long or weak loins/weak coupling: Coupling is the joining of back to the croup at the lumbosacral joint. Ideally, the L-S joint should be directly over the point of hip. Weak coupling is where the L-S joint is further to the rear. The loins are the area formed from last rib to point of hip. Although normally only 2-3 fingers breadth, long loins have more than a hand's breadth. Long loins are associated with a long back. The croup is often relatively flat and the quarters are high. Horse with weak or slack loins might have good lateral bend, but collection suffers as true collection depends on coiling loins to bend the hind legs. Because the hind legs and hocks aren't able to be positioned under body, the hind legs string out behind, so the horse is more likely to go on the forehand. This creates coordination and balance problems, as well as forelimb lameness.

Rough coupling/widow's peak: In the loins, the horse has a hollow area considerably lower than foremost part of the croup. Fairly uncommon, and does not affect the horse's use in sport. Cosmetically displeasing. Muscling of loins may be ample and strong with minimal effect on ability to collect back or push with haunches. However, if a horse doesn't have strong loins, it will have difficulty in raising the back for engagement.

Saddle-, hollow-, low-, sway-backed/ down in the back: The span of the back dips noticeably in center, forming a concave contour between the withers and croup. Usually causes high head carriage and stiffness through the back. Associated with a long back. Often associated with weakness of ligaments of the back. Examples include a broodmare who had multiple foals and the back dips with age, an old horse where age is accompanied with weakening of the ligaments, a horse with poor fitness/conditioning that prevents adequate ligament support of the back muscles, or an overuse injury to the muscles and ligaments from excess work, great loads, or premature work on an immature horse. Some horses with high croups and straight backs often appear to be swayed.

Short Croup: Often related to short quarters or pelvis (Morgans, Arabs, Quarter Horses, draft breeds, and ponies). A short croup is often steep and angular (goose rump). It provides less length of muscular

attachments to the upper and lower thigh. This diminishes engine power in speed or jumping events. A well-muscled croup may hide a short pelvis. The L-S joint is often behind point of hips. Short croups are less effective as a muscular lever for collection and to contract the abdominal muscles as the back rounds.

Flat or Horizontal Croup: Associated with flat pelvis. The topline continues in a relatively flat manner to the dock of tail rather than falling off at oblique angle at the hips. Ischium and sacrum of pelvis point upward, with the rest of the pelvis structure also being long (Saddlebreds, Arabians, and Gaited horses). Encourages a long, flowing stride with ground-covering trot because the horse can push rearward with hindlegs with ease. This helps a horse go faster, especially when a flat croup is sufficiently long to allow a greater range of muscle contraction to move the bony levers of skeleton. Racehorses do well with croup angles of 20-30 degrees, trotting horses with 35 degrees. A driving horse that carries no weight suffers no ill effect from flat croup. To prevent upward fixation of patella, a horse with a flat croup needs to have a long femur to create sufficient stifle angulations for locomotion. It is more difficult to engage the hindquarters, so the back tends to stiffen

Hunter's Bump: The horse has an enlargement at the top of the croup, or a malalignment of the croup with the pelvis and lumbar vertebrae, caused by the tearing of a ligament at the top of the croup. One or both sides of L-S joint may be affected. Fairly common, usually seen in jumping horses. It is a torn ligament caused by excessive hindquarter effort, or from a horse that had the hindquarters slip out underneath or trotted up a very steep hill. Usually does not cause problems once healed, although it is easier to re-injure. Usually associated with horses with weak loins or a long back that is unable to coil loins properly for collection. Commonly caused by overpacing young horses or a rider allowing a horse to jump while strung out.

High Tail Set: Tail comes out of body on a level with the top of the back (Arabians, Saddlebreds, Gaited horses, and Morgans). There is no direct performance consequence. Often, although not always, it is associated with a flat croup. A high-set tail contributes to the appearance of a horizontal croup, which may be an aesthetic concern to some.

Low Tail Set: Tail comes out of the body well down along the haunches. Associated with goose-rumped or steep pelvis (especially in draft breeds or Quarter horses). Only aesthetic concern unless directly caused by pelvic conformation.

Wry Tail/ Tail Carried to One Side: The tail is carried cocked to one side rather than parallel to the spine. (Usually in Arabians).May be because the horse is not straight between the rider's aids, can be used to determine how straight a horse is traveling behind. Over time, incorrect body carriage may place undue stress on limbs. May be from injury or discomfort, with the horse using the tail as a brace.

Take a rope or string and measure around barrel behind elbow and around the loin. The underbelly should not be a hay belly and a rope around the girth should about equal a rope around the loin. (The horse should not be tucked up or herring gutted).

Wide Chest and Barrel/Rib Cage: Rounded ribs increase the dimensions of the chest, creating rounded, cylindrical or barrel shape to the rib cage. Length of the ribs tends to be short. (American Quarter Horses, and some Warmbloods). Provides ample room for the expansion of the lungs. Too much roundness increases the size of the barrel, may restrict upper arm movement, the length of stride, and thus speed. Round ribs with a short rib length further restrict the shoulder. Pushes the rider's legs further to the side of the body, and can be uncomfortable, especially in sports that require long hours in saddle or that require sensitive leg aids (dressage, cutting, reining).

Pear-Shaped Ribcage/Widens Toward Flank: The horse is narrow at the girth and behind the girth at mid-chest, then widens toward the flank (Arabians, Saddlebreds, and Gaited horses). Makes it difficult to hold the saddle in place without a breastplate or crupper, especially on uneven terrain, jumping, or low crouch work with quick changes of direction (cutting). When saddle continually shifts, the rider's balance is affected, and the horse and rider must make constant adjustments. Saddle slippage has the potential to create friction and rubs on back or cause sore back muscles.

Well-Sprung Ribs: Ribs angle backward with sufficient length, breadth, and spacing to provide an arched rib cage and chest with deep dimensions from front of the chest to the back. Largest part of the barrel is just behind the girth area. Last rib is sprung outward and inclined to the rear, with the other ribs similar in length, roundness, and rearward direction. Promotes strong breathing and air intake, improving performance and muscular efficiency. Ample area of attachment of shoulder, leg and neck muscles, enabling a large range of motion for muscular contraction and speed of stride. The rider's weight is easily balanced and stabilized since the saddle stays steady and the rider can maintain close contact on horse's side with leg. There is sufficient room for developing strong loin muscles while still having short loin distance between last rib and point of hip (close coupling).

Slab-Sided: Poor spring of the ribs due to flatness and vertical alignment of the ribs. Ribs are adequate in length. (Thoroughbreds, Saddlebreds, Tennessee Walkers, and Gaited horses).There is less room for the lungs to expand, limiting the efficiency of muscular metabolism with prolonged, arduous exercise. If there is a short depth in the chest, the horse will have a limited lung capacity which is likely to limit the horse's ability for speed work. Horse generally has lateral flexibility. Narrowness makes it difficult for the rider to apply aids since the legs often hangs down without fully closing on the horse. More effort needed to stay on the horse's back because of limited leg contact and the saddle tends to shift. Horse has a harder time carrying the rider's weight because of reduced base of support by narrow back muscles.

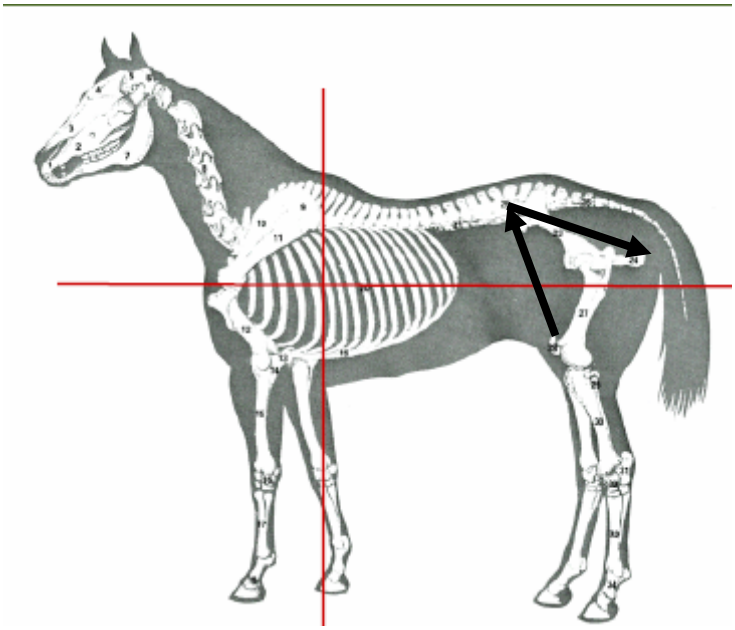
Tucked Up/Herring-Gutted/Wasp-Waisted: Waist beneath the flanks is angular, narrow, and tucked up with a limited development of abdominal muscles. Often associated with short rear ribs, or undernourished horses. Often a result of how horse is trained and ridden. If a horse doesn't use its back to engage, they never develop their abdominal muscles. Appears to be like a lean runner (greyhoundish), with stringy muscles on topline and gaskin. Lack of abdominal development reduces overall strength of movement. Stamina is reduced, and the back is predisposed to injury.

Good Depth of Back: The depth of the back is the vertical distance from lowest point of back to bottom of abdomen. Point in front of sheath or udder should be parallel to the ground and comparable in depth to front portion of chest just behind the elbow at the girth. Good depth indicates strong abdominal muscles, which are important for strength and speed. Critical to dressage, jumping, and racing. Strong abdominals go with a strong back, which is suitable for carrying a rider's weight and engaging the haunches. Should not be confused with an obese horse in "show" condition, as fat just conceals wasp-waistedness.

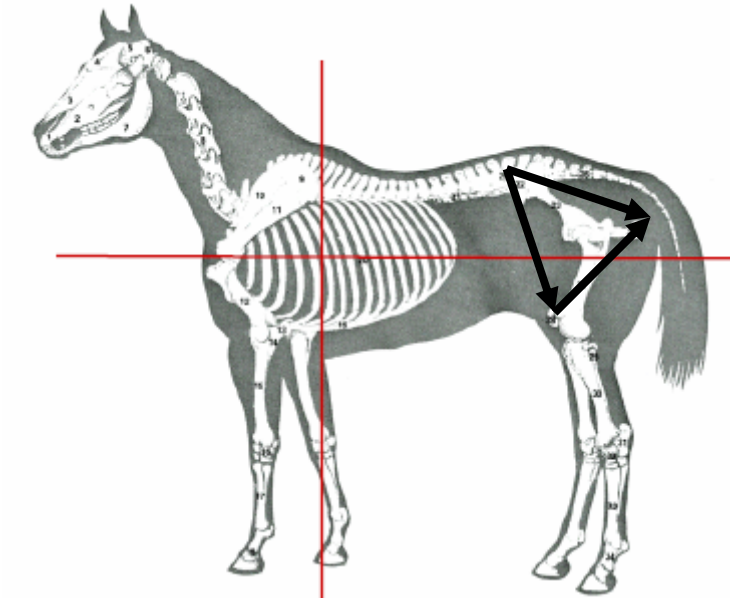
Conformation of the Hindquarters and Hips

Draw a line from the point of the hip to the point of the buttock. This is the length of the pelvic bone. Compare this length to the total body length. This tells you how the "motor" compares to the rest of the body. It should go no more than 3 times into the length of the body. Assess the angle of the line (point of hip to buttock) should be about 15º - thoroughbred typically larger. Need slope so horse can draw back and pelvis down to coil to jump, slide to stop or collect for dressage.

(Crossed lines = center of gravity at point of +)



An ideal conformation for a performance horse should contain a perfect triangle from the point of the hip to the point of the rump to the point of the stifle. Any loss of measurement in the triangle will result in loss of the ideal balance and force of the muscle action of the hindquarter.



Short Hindquarters: Measured from the point of hip to the point of buttock, the hindquarters should be ideally at least 30% of length of overall horse. Anything less is considered short. Most horses are between 29-33%; Thoroughbreds may have a length reaching 35%. Insufficient length minimizes the length of the muscles needed for powerful and rapid muscular contraction. This reduces speed over distance, stamina, sprint power, and staying ability/Tends to reduce the horse's ability to fully engage the hindquarters need for collection or to break in a sliding stop

Goose or Steep-Rumped: Viewed form the side, the pelvis assumes a steep, downward slope. A steep slant of the pelvis lowers the point of buttock bringing it closer to the ground & shortening the length of muscles from the point of buttock & the gaskin. Shortens the backward swing of the leg because of reduced extension & rotation of hip joint. A horse needs a good range of hip to get a good galloping speed and mechanical efficiency of hip and croup for power & thrust. Therefore, a goose-rumped horse is not good at flat racing or sprinting. Harder for a horse to "get under" and engage the hindquarters. Causes the loins and lower back to work harder, predisposing them to injury. A goose-rump is valuable in sports with rapid turns & spins (reining, cutting). The horse is able to generate power for short, slow steps (good for draft work).

Cat-Hammed/Frog's Thighs: The horse has poor development in the hindquarters, especially the quadriceps and thighs. Associated with goosed-rumps & sickle hocks. Uncommon, most usually seen in gaited horses. Can develop from years in confinement. The horse lacks the development needed for speed and power, so the horse is not fast or strong. The horse's gait tends to be more ambling than driving at the trot, so the horse often develops a stiff torso & back, making the ride rigid.

Narrow Hips: Viewed from the rear, the breadth between the hips is narrow. A narrow pelvis contributes to speed since the horse can get its hind legs well under its body to develop thrust. The narrow hip shape is partially dictated by exercise development of haunch muscles. Good width widens the breadth between stifles, hocks & lower legs to enable power, acceleration, & foot purchase into ground, preventing interference injuries. Narrow pelvis limits size of muscular attachments of hips, affecting strength & power.

Rafter Hips: Wide, flat hip shaped like a "T" when viewed from behind. Cattle tend to have this pelvis type to the extreme. Rafter hips are often amplified by poor muscling along thighs and lower hips. Exercises to improve muscling helps the problem.

One Hip Bone Lower/Knocked-Down Hip: From behind, the point of hip on one side is lower than the other. May be due to an injury to the point of hip, or to sublaxtion or fracture of the pelvis. Generally induced by a traumatic blow to hip. Not heritable. The gait symmetry is affected (which is bad for dressage or show horse). Interference with power and thrust may alter strength of jumping high fences or reduce speed. The horse is more prone to developing muscular or ligament soreness associated with re-injury or strain. This is especially likely to occur in a jumper, racer, steeplechaser, or eventer. However, in most cases the horse recovers completely.

High Stifles/ Short Hip: Ideal hip forms equilateral triangle from point of buttock, point of hip, and stifle. (see figure above) A short hip has a short femur (thigh bone) that reduces the length of quadriceps and thigh muscles. The femur is short when the stifle seems high (sits above sheath in male horse).Effective in generating short, rapid, powerful strokes (sprint or draft work). The horse has a rapid thrust & thus rapid initiation of sprint speed. Ideally, the bones of the gaskin and femur should be of similar length in horse that does anything but sprint or draft work. A short femur reduces stride length behind & elasticity of stride that jumpers, dressage horses, and flat/harness racers want.

Low Stifle/ Long Hip: A long hip is created by a long femur which drops the level of stifle to or below the sheath line on a male horse. Favorable in all sports except sprint sports and draft work .Enables the horse to develop speed and power after it gets moving. The muscles of the hip, haunches, and thighs will be

proportionately long with a long hipbone, giving the horse the capacity to develop speed and power over a sizable distance. Produces ground-covering and efficient stride in all gaits.

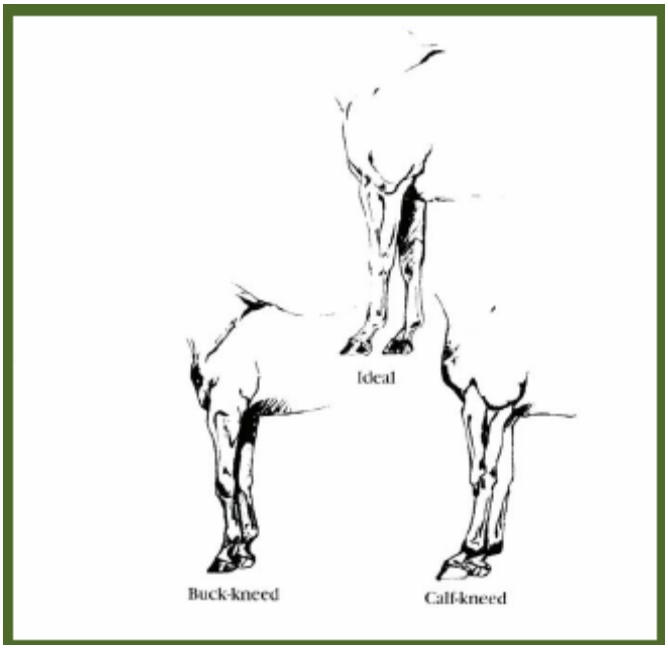
Conformation of the Front and Hind Legs

Long Cannon Bone: The cannon is long between the knee and fetlock, making the knees appear high relative to the overall balance of the horse. Reduces the muscular pull of the tendons on the lower leg. Uneven terrain or unlevel foot balance will magnify the stress on the carpus (knee) since lengthy tendons are not as stabilizing to the lower limb as shorter ones. Increases the weight on the end of the limb, contributing to less efficient and less stable movement. Added weight to front legs increases the muscular effort needed in picking up a limb, leading to hastened fatigue. Increase in tendon/ligament injury, especially when the horse is also tied-in above the knee.

Short Cannon Bone: Cannon is relatively short from carpus (knee) to elbow. This conformation is desirable in any performance horse. A short cannon bone improves the ease and power of the force generated by the muscles of a long forearm or gaskin. Enables an efficient pull of the tendons across the back of the knee or point of hock to move the limb forward and back. Also reduces the weight of the lower leg so less muscular effort is needed to move the limb, which contributes to speed, stamina, soundness, and jumping ability.

Rotated Cannon Bone: The cannon rotates to the outside of the knee so it appears twisted in its axis relative to knee. May still be correct & straight in alignment of joint, but more often associated with appearance of carpus valgus (knock knee). Places excess strain on the inside of the knee and lower joints of the leg, potentially leading to soundness issues, although this is not common.

Bench or Offset Knees/ Offset Cannons: The cannons are set to the **outside** of the knee so an imaginary plumb line does not fall through middle. Causes excessive strain on the lateral surfaces of the joints from the knee down and on the outside portions of the hoof. There is an exaggerated amount of weight supported by the medial splint bone, leading to splints.

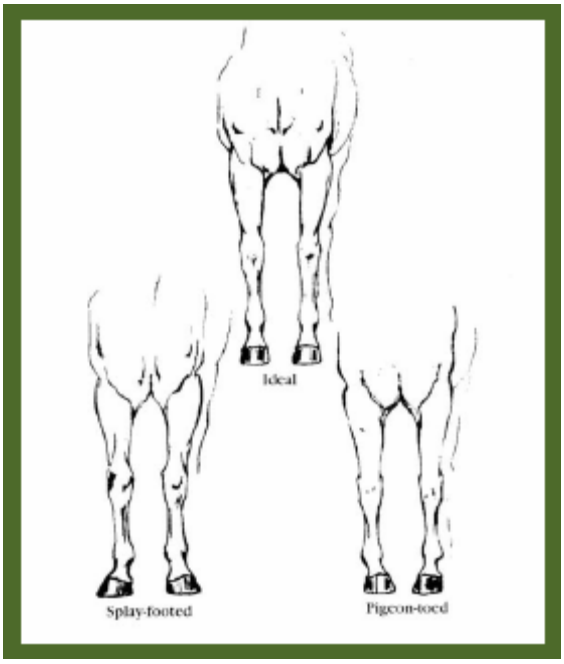


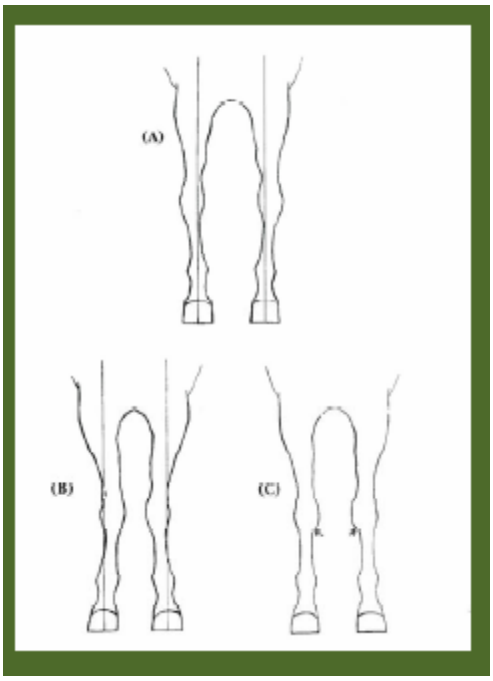
Tied-in Below the Knee: The cannon, just below the knee, appears "cut out" with a decreased tendon diameter. Rather than parallel with cannon, tendons are narrower than the circumference measured just above the fetlock. Limits the strength of the flexor tendons that are needed to absorb the concussion and diffusion of impact through the legs, making the horse more prone to tendon injuries, especially at the midpoint of the cannon or just above. The leverage of muscle pull is decreased as the tendons pull against the back of knee rather than a straight line down back of leg. This reduces power and speed. Associated with a reduced size in the accessory carpal bone on back of knee over which the tendons pass. The small joints are prone to injury and don't provide adequate support for the column of leg while under weight-bearing stress.

Medial Carpal Deviation/ Carpus Valgus/ Knock-Kneed: One or both knees deviate inward toward each other, with the lower leg angles out, resulting in a **toed-out** stance. Occurs because of an unequal development of the growth plate of distal radius, with the outside growth plate growing faster than inside. The bottom of the forearm seems to incline inward. Any horse can inherit this, but it may also be acquired from imbalanced nutrition leading to developmental orthopedic disease (DOD) or a traumatic injury to growth plate.

Bucked, Sprung, or Goat Knees/ Over at the Knee: Knee inclines forward, in front of a plumb line, when viewed from the side. Often a result of an injury to the check ligament or to the structures at the back of the knee. The column of the leg is weakened. Thus, the horse is apt to stumble and lose balance due to the reduced flexibility and from the knee joints that always are "sprung." If congenital, often associated with poor muscle development on the front of the forearms, which limits speed and power. More stress is applied to the tendons, increasing the risk of bowed tendons. The angle of attachment of the DDF and check ligament is increased, predisposing the check ligament to strain. Tendons and fetlock are in an increased tension at all times, so the horse is predisposed to injury to the suspensory (desmitis) and sesamoid bones. If the pasterns are more upright there is further stress.

Calf-Kneed/Back at the Knee: The knee inclines backward, behind a straight plumb line dropped from the middle of the forearm to the fetlock. Usually leads to unsoundness in horses in speed sports. Places excess stress on the knee joint as it overextends at high speeds when loaded with weight. Backward angle causes compression fractures to the front surfaces of the carpals, and may cause ligament injury within knee. Worsens with muscle fatigue as the supporting muscles & ligaments loose their stabilizing function. Calf-knees weaken the mechanical efficiency of the forearm muscles as they pull across the back of the carpus, so a horse has less power and speed. The tendons and check ligament assume an excess load so the horse is at risk for strain. Often the carpals are small & can't diffuse the concussion of impact. The horse should have good shoeing, eliminating LTLH (long-toe, low-heel) syndrome.





(a = bowlegged, b = knocked kneed c = benched knee)

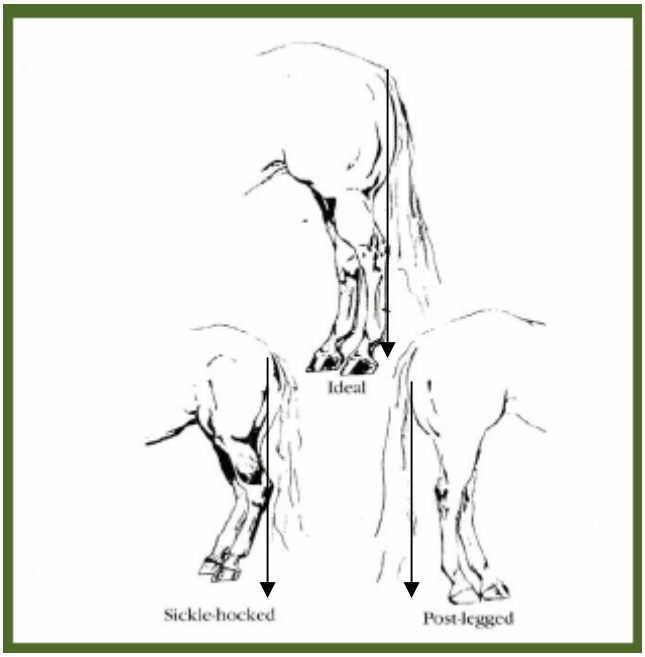
Toed-Out/Lateral Deviation of Pastern from Fetlock/ Fetlock Valgus: An angular limb deformity that creates a toed-out appearance *from the fetlock down*. A fairly common fault. Creates excess strain on one side of the hoof, pastern and fetlock, predisposing the horse to ringbone, foot soreness or bruising. The horse will tend to **wing,** possibly causing an interference injury. May damage splint or cannon bone. This conformation diminishes the push from rear legs, as symmetry and timing of the striding is altered with the rotated foot placement, particularity at the trot. Thus, stride efficiency is affected to slow the horse's gait.

Toed-In/Medial Deviation of Pastern/Fetlock Varus: An angular limb deformity causing a pigeon toed appearance from the fetlock down, with the toe pointing in toward the opposite limb. These horses tend to **paddle**, creating excess motion and twisting of the joints with the hoof in the air. This is unappealing in show horse, wasteful energy, which reduces the efficiency of the stride, so the horse fatigues more quickly. The hoof initially impacts ground on inside wall, causing excess stress on the inside structures of the limb, leading to ringbone, sole or heel bruising in inside of hoof.

Short Gaskin/Hocks High: Results from a relatively short tibia with a long cannon. Ideally, hocks are slightly higher than the knees, with the point of hock level with the chestnut of the front leg. Hocks will be noticeable higher in horse with this conformation. * The horse may have a downhill balance with the croup higher than the withers. With this conformation, the horse can pull the hind legs further under the body, so there is a longer hind end stride, but the animal may not move in synchrony with the front. This will create an inefficient gait, as the hind end is forced to slow down to let the front end catch up, or the horse may take high steps behind, giving a flashy, stiff hock and stifle look. May cause forging or overreaching. Short gaskin and high hocks often results in sickle hock conformation.

Long Gaskin/Low Hocks: Long tibia with short cannons. Creates an appearance of squatting. A long gaskin causes the hocks and lower legs to go behind the body in a camped-out position. The leg must sickle to get it under the body to develop thrust, causing those related problems. The long lever arm reduces muscle efficiency to drive the limb forward. This makes it hard to engage the hindquarters. The rear limbs may not track up & the horse may have a reduced rear stride length, forcing the horse to take short steps.

Hocks Too Small: Hock appears small relative to the breadth and size of adjacent bones. Same principals with knees too small. The joints are a fulcrum which tendons and muscles pass over for power & speed, and large joints absorb concussion & diffuse the load of the horse. Small joints are prone to from concussion & instability, especially in events where the horse works off its hocks a lot. A small hock doesn't have a long tuber calcis (point of hock) over which the tendons pass to make a fulcrum. This limits the mechanical advantage to propel the horse at speed. The breadth of the gaskin also depends on hock size, and will be smaller.



Hocks = ankles of the horse.
The hind leg is an organ of locomotion not support.
Plumb line from point of buttock should drop straight down back of the canon bone. If it drops in front of or in the middle of the canon, the hind legs are too long and the angulation is too closed. If it drops behind the hock and the legs are straight the horse is post-legged.
Muscling should carry well down the leg, great bulk on the side and good muscling on the gaskin. Big and no puffiness or curbs.
Tendons should fill the whole space.

Cut Out Under the Hock: Front of the cannon, where it joins the hock, seems small & weak compared to the hock joint. In the front end, it's called "tied in at knee." Mainly affects sports that depend on strong hocks (dressage, stock horse, jumping). Reduces the diameter of the hock and cannon, which weakens the strength & stability of the hocks. Means a hock is less able to support a twisting motion (pirouettes, roll backs, sudden stops, and sudden turns). The horse is at greater risk for arthritis or injury in hock.

Camped Out Behind: Cannon and fetlock are "behind" the plumb line dropped from point of buttock. Associated with upright rear pasterns. Rear leg moves with greater swing before the hoof contacts the ground, which wastes energy, reduces stride efficiency, & increases osculation & vibrations felt in joints, tendons, ligaments, & hoof. May cause quarter cracks & arthritis. Difficult to bring the hocks & cannons under unless the horse makes a sickle hocked configuration. Thus, the trot is inhibited by long, overangulation of the legs & the horse trots with a flat stride with the legs strung out behind. .

Sickle- or Sabre-Hocked/ Overangulated Long Hind Legs: The hind leg slants forward, in front of the plumb line, when viewed from the side. The cannon is unable to be put in vertical position. Also called "curby" hock, as it is associated with strain of plantar ligament on the rear, lower part of the hock. Limits the straightening & backward extension of hocks, which this limits push-off, propulsion, & speed. There is overall more hock & stifle stress. Closed angulation & loading on the back of the hock predisposes the horse to bone & bog spavin, thoroughpin, & curb.

Post-Legged/Straight Behind: Angles of the hock & stifle are open. The tibia is fairly vertical, rather than having a more normal 60 degree slope. In theory, sickle hocks facilitate forward & rearward reach as the hock opens & closes with a full ranger of motion without the hock bones impinging on one another. This leads to selective breeding of speed horses with straight rear legs, especially long gaskins. The problem is

that this breeding has been taken to the extreme. Tension on the hock irritates the joint capsule & cartilage, leading to bog & bone spavin. Restriction of the Achilles tendon sheath while in motion leads to thoroughpin. A straight stifle limits the ligaments across the patella, predisposing the horse to upward fixation of the patella, with the stifle in a locked position, which interferes with performance & can lead to arthritis of stifle. It is difficult for the horse to use its lower back, reducing the power & swing of the leg. Rapid thrust of the rear limbs causes the feet to stab into the ground, leading to bruises & quarter cracks.

Bow-Legged/Wobbly Hocks: Hocks deviate from each other to fall outside of plumb line, dropped from point of buttocks, when the horse is viewed from behind. Hoof swings in as the horse picks up its hocks & then rotates out, predisposing the animal to interference & causing excess stress on lateral hock structures, predisposing the horse to bog & bone spavin, & thoroughpin. The twisting motion of the hocks causes a screwing motion on the hoof as it hits the ground, leading to bruises, corns, quarter cracks, and ringbone. The horse does not reach forward as well with the hind legs because of the twisting motion of the hocks once lifted, & the legs may not clear the abdomen if the stifles are directed more forward than normal. This reduces efficiency for speed & power.

Cow Hocks/Medial Deviation of the Hocks/Tarsus Valgus: Hocks deviate toward each other, with the cannon & fetlock to the outside of the hocks when the horse is viewed from the side. Gives the appearance of a half-moon contour from the stifle to hoof. Often accompanied by sickle hocks. Many times Arabians, Trakehners, & horses of Arabian descent are thought to have cow hocks. But really the fetlocks are in alignment beneath the hocks, so they're not true cow hocks. **A slight inward turning of hocks is not considered a defect & should have no effect.** A horse with a very round barrel will be force to turn stifles more out, giving a cow-hocked appearance. Medial deviation in true cow hocks causes strain on the inside of the hock joint, predisposing the horse to bone spavin. Abnormal twisting of pastern & cannon predisposes fetlocks to injury. More weight is carried on medial part of hoof, so it is more likely to cause bruising, quarter cracks, & corns. The lower legs twist beneath the hocks, causing interfering. The horse develops relatively weak thrust, so speed usually suffers.

Conformation of the Pasterns

The angle of the pasterns is best at a moderate slope (about 50 degrees) and moderate length.

Pasterns Long and Sloping: The pastern are long (more than 3/4 length of cannon) relative to rest of leg. This defect affects long-distance and speed sports. Long pasterns have been favored because can diffuse impact, giving a more comfortable ride. However, excess length puts extreme tension on the tendons and ligaments of the back of the leg, predisposing the horse to a bowed tendon or suspensory ligament injury. The suspensory is strained because fetlock is unable to straighten as horse loads the limb with weight. The pasterns are weak and unable to stabilize fetlock drop, so the horse is predisposed to ankle injuries, especially in speed events where the sesamoids are under extreme pressure from the pull of the suspensory. This can cause sesamoid fractures & breakdown injuries. May be associated with high or low ringbone. Increased drop of fetlock causes more stress on pastern and coffin joints, setting up conditions for arthritis. There is a delay time to get the feet off the ground to accelerate, and thus long pasterns make the horse poor for speed events.

Pasterns Short and Upright: A horse's pasterns are short if they are less than 1/2 length of cannon. The pasterns are upright if they are angled more toward the vertical. A long, upright pastern has the same performance consequences as short and upright. The horse is capable of rapid acceleration, but is restricted to a short stride. They excel in sprint sports. The short stride is a result of both a short pastern and upright shoulder, creating a short, choppy stride with minimal elasticity and limited speed. Short pasterns have less shock-absorption, leading to more a jarring ride and amplified stress on the lower leg. The concussion is felt over the navicular apparatus, so the horse is more at risk for navicular disease, high or low ringbone,

and sidebone. Also windpuffs and windgalls occur from chronic irritation within fetlock or flexor tendon sheath. The horse has reduced mechanical efficiency for lifting and breaking over the toe, so it may trip or stumble.

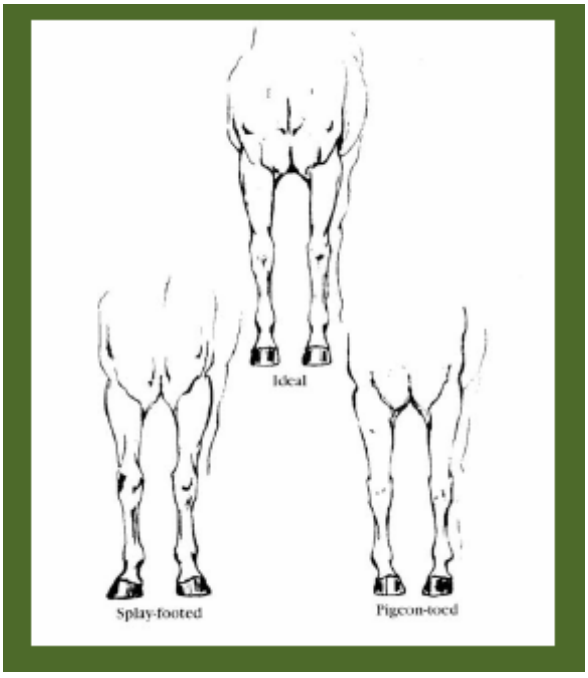
Conformation of the Feet and Base

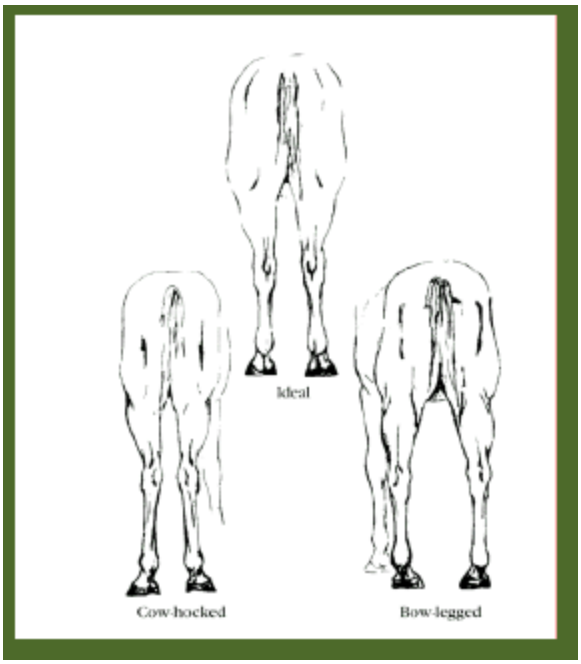
Toed-Out/Splay Footed: The horse's feet are turned away from each other. Causes winging motion that may lead to interfering injury around fetlock or splint. As horse wings inward, there is a chance that he may step on himself, stumble, and fall. A horse that is “tied in behind the elbow” has restricted movement of the upper arm because there is less clearance for the humerus (it angles into the body too much). Reduced clearance of legs causes horse to toe-out to compensate.

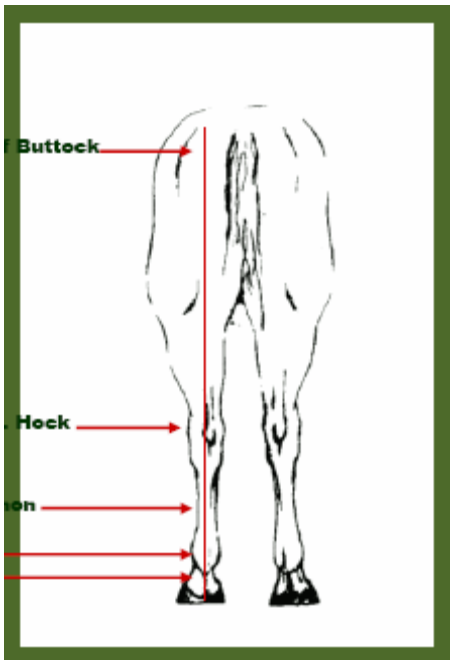
Toed-In, Pigeon-Toed: Toes of hooves face in toward each other. Pigeon-toes cause excess strain on the outside of the lower structures of the limb as the horse hits hard on the outside hoof wall. This often leads to high or low ringbone. The horse is also predisposed to sidebone and sole bruising. The horse moves with a paddling motion, wasting energy and hastening fatigue so that he has less stamina.

Base Narrow in Front: Toed-Out or Toed-In: The feet are closer together and more under the body than the shoulders. Base-narrow, toed-out: Stresses the outside structures of the limb, especially the outside of the foot. Causes a winging motion, leading to interfering. Predisposes the horse to plaiting. The horse tends to hit himself more when fatigued. Base narrow, toed-in: Excessive strain on the lateral structures of fetlock, pastern, and outside of hoof wall. Causes the horse to paddle.

Base Wide in Front: Toed-In or Toed-Out: The horse stands with its feet placed wider at the shoulders, often associated with a narrow chest. Base wide, toed-out: the horse lands hard on the outside of the hoof wall and places excessive strain on the medial structures of the fetlock and pastern, leading to ringbone or sidebone, & potentially spraining structures of the carpus. The horse will wing in, possibly leading to an interference injury or overload injury of the splint bone. Base wide, toed-in: the horse lands hard on the inside hoof wall, placing stress on the medial structures of limb. The horse will also paddle.







Structural Correctness

Stands Close Behind/Base Narrow Behind: With a plumb line from the point of buttock, the lower legs & feet are placed more toward the midline than the regions of hips & thigh, with a plumb line falling to the outside of the lower leg from the hock downward. Usually accompanied by bow-legged conformation. The hooves tend to wing in, so the horse is more likely to interfere. If the hocks touch, they may also interfere. The horse can't develop speed for rapid acceleration. The outside of the hocks, fetlocks, & hooves receive excessive stress & pressure. This leads to DJD, ligament strain, hoof bruising, & quarter cracks.

Feet Too Small: Relative to size and body mass, the feet are proportionately small. A small foot is less capable of diffusing impact stress with each footfall than a larger one. On hard footing, the foot itself receives extra concussion. Over time, this can lead to sole bruising, laminitis, heel soreness, navicular disease, and ringbone. Sore-footed horses take short, choppy strides, so they have a rough ride and no gait efficiency. If the horse has good shoeing support, it can comfortably participate in any sport, although it is more likely to stay sound in sports that involve soft footing.

Feet Large and Flat/ Mushroom-Footed: Large in width & breadth relative to body size & mass. May have slight pastern bones relative to large coffin bone. Flat feet limit the soundness of the horse in concussion sports (jumping, eventing, steeplechase, distance riding). Without proper shoeing or support, the sole may flatten. Low, flat soles are predisposed to laminitis or bruising. The horse takes on a choppy, short stride. It is hard for the horse to walk on rocky or rugged footing without extra protection on the hoof. **A large foot with good cup to sole is ideal foot for any horse. There is less incidence of lameness, and it is associated with good bone.**

Mule Feet: Horse has a narrow, oval foot with steep walls. A mule foot provides little shock absorption to foot & limb, creating issues like sole bruising, corns, laminitis, navicular, sidebone, and ringbone. Not all horses have soundness issues, especially if they are light on the front end & have very tough horn. Because the hind end provides propulsion, it is normal to see narrower hooves on back compared to front.

Coon-Footed: The slope of hoof wall is steeper than the pastern, often associated with long, sloping pasterns tending to the horizontal, which breaks the angulation between pastern and hoof. Usually seen in rear feet, especially in post-legged horses. Paso Fino horses have coon foots sometimes due to a weak

suspensory that allows the fetlock to drop. Coon feet create similar problems as too long & sloping pasterns (the horse prone to run-down injuries on back of fetlock). If foot lift off is delayed in bad footing, ligament and tendon strain & injury to the sesamoid bones is likely. Weakness to supporting ligaments due to post leg or injury to suspensory will result in a coon-foot as the fetlock drops.

Club Foot: The slope of the front face of hoof exceeds 60 degrees. Horse often has long, upright heels. May be from contracture of DDF (deep digital flexor tendon) that was not addressed at birth or developed from nutritional imbalances or trauma. Fairly common, best to use horse in activities done in soft-footing & those that depend on strong hindquarter usage. Various degrees of angulations, from slight to very pronounced. Horses with obvious club feet land more on the toes, causing toe bruising or laminitis. The horse generally does poorly at prolonged exercise, especially if on hard or uneven terrain (eventing, trail riding). Because the toe is easily bruised, the horse moves with a short, choppy stride, and may stumble. The horse is a poor jumping prospect due to trauma incurred on impact of landing.

Contracted Heels: The heels appear narrow and the sulci of frogs are deep while frog may be atrophied. Contracted heels are not normally inherited, but a symptom of limb unsoundness. A horse in pain will protect the limb by landing more softly on it. Over time, the structures contract. The source of pain should be explored by a vet. Contracted heels create problems like thrush. The horse losses shock absorption ability, creating navicular, sole bruising, laminitis, and corns. May restrict heel expansibility, causing lameness from pressure around coffin bone & reduced elasticity of digital cushion.

Thin Walls: Wall is narrow and thin when viewed from bottom. Often associated with flat feet or too small feet. Thin walls reduce the weight-bearing base of support, and are often accompanied by flat or tender soles that easily bruise. The horse is subject to developing corns at the angles of the bar. The horse tends to grow long-toes with low heels, moving the hoof tubules in horizontal direction, and so it reduces shock absorption ability and increases the risk of lameness. Less integrity for expansion and flexion of hoof, making it more brittle and prone to sand & quarter cracks. Narrow white line makes it hard to hold shoes on.

Flared Hoof Wall: One side of the hoof flares towards its bottom, relative to the steep appearance of the other side. Flared surface is concave. May be conformationally induced from angular limb deformity or misalignments of the bones within the hoof. These conformational problems cause excess strain on one side of hoof making it steepen, while the side with less impact grows to a flare. The coronary band often slopes asymmetrically due to pushing of hoof wall & coronet on steep side, which gets more impact than flared. May develop sheared heels, causing lameness issues, contracted heels & thrush. May be acquired from imbalanced trimming methods over time that stimulates more stress on one side of foot. Chronic lameness may make the horse load the limb unevenly, even if the lameness may be in hock or stifle.