

## Leg Set: Its Effect on Action and Soundness of Horses

*NOTE: The author is Melvin Bradley, Professor Emeritus, Department of Animal Science, University of Missouri. This series of bulletins is reprinted for Michigan use through courtesy of the University of Missouri—Richard Dunn, Extension Specialist in Animal Science, Michigan State University.*

It is difficult to overstress underpinning (feet and legs) when appraising the worth of a horse. Except for breeding stock, horses are useful only when in motion. In a very real sense, the horse is an athlete. Any physical handicap that causes him to be clumsy, use excessive energy to perform a task, be hard riding, lack strength or speed, or wear excessively, decreases his potential usefulness.

Good action is determined largely by set of the feet and legs, slope of the shoulders and pasterns, and shortness of back and coupling relative to length of underline or belly. Good performance reflects structural straightness, physical fitness, and confidence gained from systematic training.

The breeder or prospective buyer can save much time by avoiding horses whose potentials are limited by physical handicaps, such as crooked legs, if he becomes proficient in their identity and allocates his resources accordingly.

Some physical handicaps are "acquired" through faulty diet or injury, but probably far more of these are claimed than actually exist. In most cases the condition

is genetic and must be charged to the sire and/or dam. For this reason, breeding animals, especially stallions, should be free of major conformation defects.

### CORRECT AND INCORRECT LEG SET

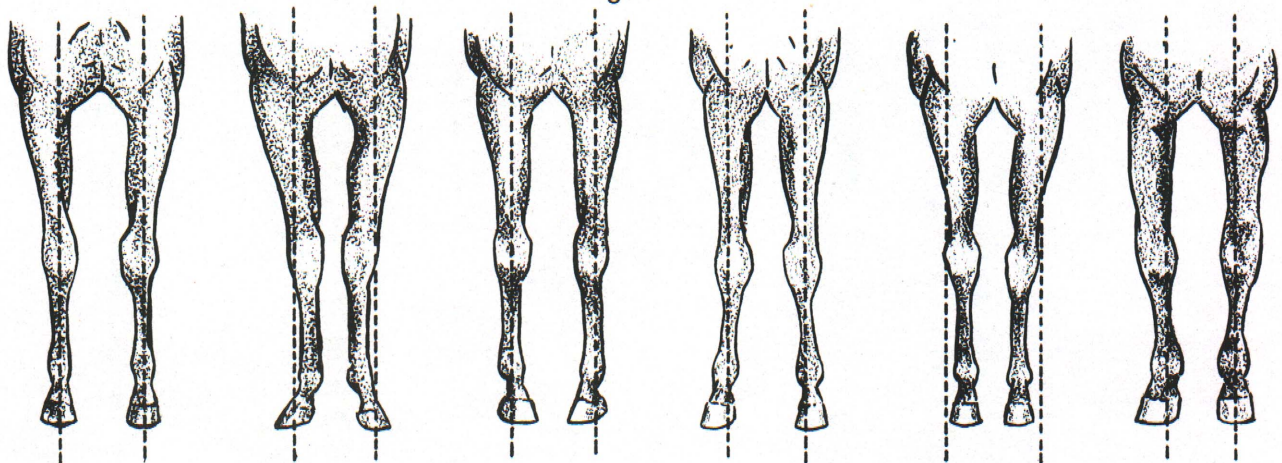
Correct leg set implies "a leg under each corner of the body," accompanied by adequate, straight bone with short canons; long, correctly-sloped pasterns and medium sized, balanced feet.

A horse that stands correctly will almost always move correctly. Conversely, one that stands crooked must move likewise.

### FRONT LEGS

A plumb line dropped from the point of the shoulder should bisect the knee, cannon, ankle, and foot (Fig. 1A). One dropped from the arm should bisect the forearm, knee, cannon, and fetlock, and pass behind the heel (Fig. 2A). The pasterns should be compatible in length with breed requirements, slope at an angle of 45°, and join the foot without changing this angle.

Figure 1



- A. Straight legs, good front.  
B. Splay-footed.  
C. Pigeon-toed.

- D. Knock-kneed, narrow front, base wide.  
E. Base-narrow.  
F. Bow-kneed.



Figures 1B through F and 2B through F show common defects of front leg set that affect action.

Splayed-feet and pidgeon-toes are quite common and affect action in proportion to their degree. Knock-knees, bowed-knees, and base-narrow defects are less common but affect action and predispose to unsoundness.

Short, straight pasterns increase concussion to the horse and rider which seriously predispose the horse to

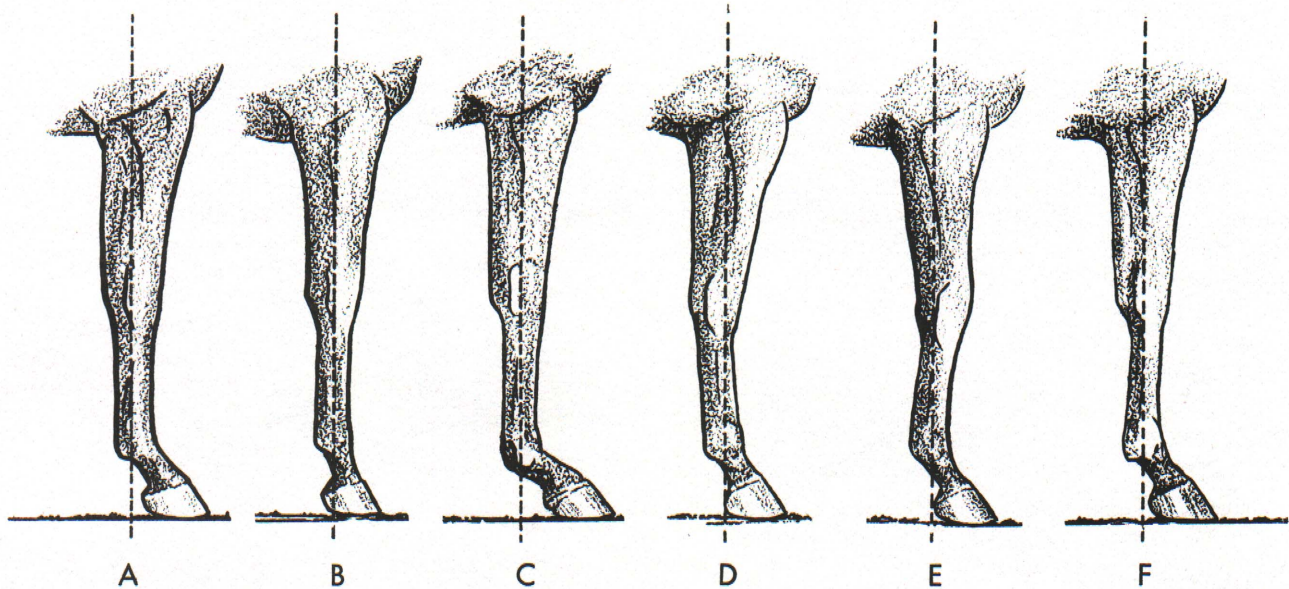
unsoundnesses and induce fatigue to horse and rider.

Long, weak pasterns ride easy but affect action and are undesirable for good stops with roping horses.

Calf-knees are common and detract from appearance, whereas buck-knees are uncommon except with jumpers.

"Tied-in" below the knee or hock indicates inadequate tendon and ligament development for long, trouble free service.

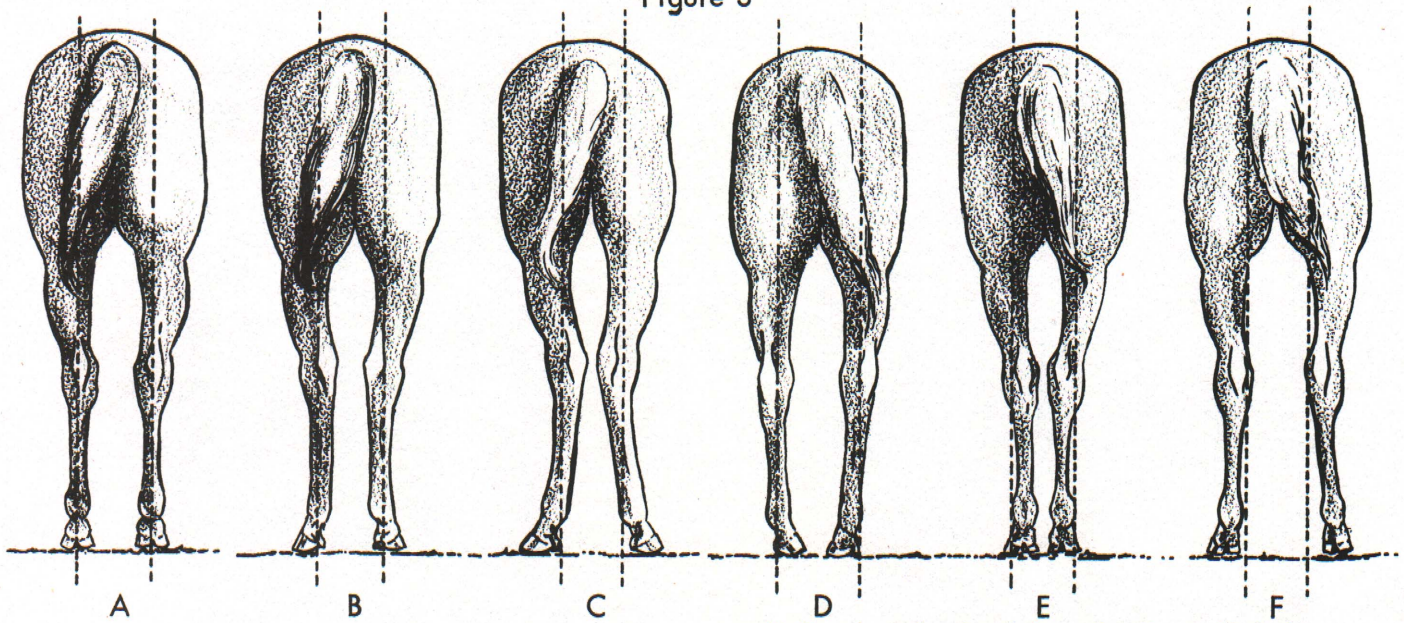
Figure 2



- A. Correct, good bone.
- B. Pastern too straight.
- C. Pastern too long and flat, angle different than foot, "coon-footed."

- D. Calf-kneed, short, straight pastern.
- E. Buck-kneed or over on the knee.
- F. "Tied in" or fine bone below the knee.

Figure 3



- A. Straight legs.
- B. Slightly cow-hocked.
- C. Extremely cow-hocked, splay-footed.

- D. Bow-legged or bandy-legged or "too wide," pigeon toed.
- E. Base-narrow or stands close.
- F. Base-wide or stands wide.



## HIND LEGS

Bone structure of the hind leg determines, to a large degree, set of the feet and legs, and to a lesser degree arrangement and shape of muscling in the hind quarters (Fig. 4A). Correct leg set can't be achieved with crooked bones. Bone structure is genetically determined.

A plumb line dropped from the point of the buttock should bisect the thigh, gaskin, hock, cannon, fetlock, pastern, and foot (Fig. 3A). Viewed from the side, it should contact the back of the hock, cannon, and fetlock (Fig. 4B).

Figures 3B through F and 4C through F show common faults of hind leg set.

Almost all horses display cow-hocks to a degree. Some horsemen prefer that hocks point slightly toward each other with the feet pointing slightly outward. This is insurance against wide hocks or bandy legs.

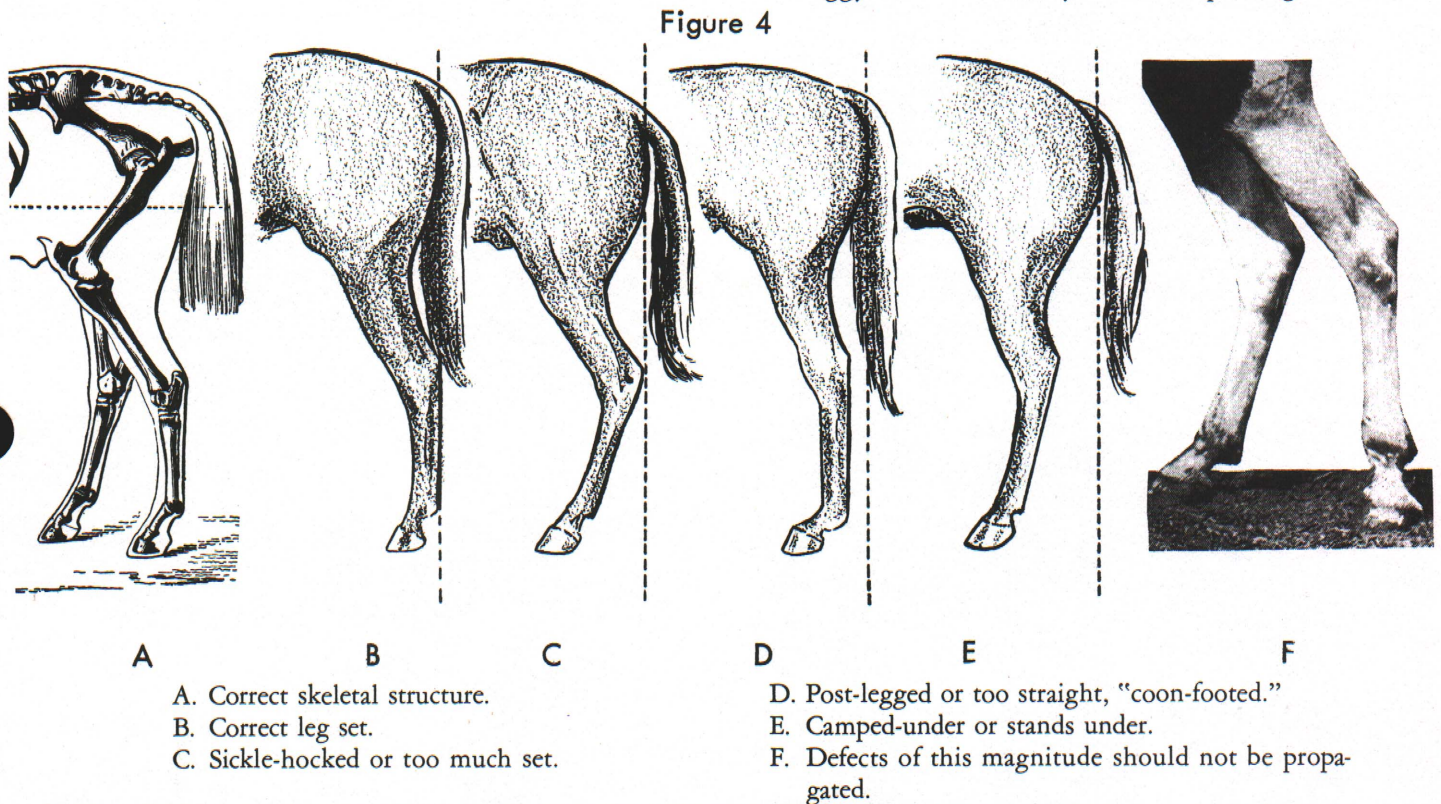
Noticeable cow-hocks are undesirable both from the standpoint of action and appearance.

Bandy legs or wide hocks seriously deter collected action and predispose to unsoundness.

Sickle hocks are quite common and are serious because of the stress placed on the hocks in performance and the many unsoundnesses that are associated with them.

View a stallion with sickle hocks with concern.

Boggy hocks are usually seen with post-legs.



## CORRECT AND INCORRECT ACTION

### CORRECT ACTION

The feet and legs of a horse at the walk or trot should move straight ahead parallel to an imaginary center line in the direction of travel. The feet should rock upward from the heel and break over squarely at the toe and should rise with a snap. They should be carried forward in a straight arc with the highest point of the arc occurring at the center of travel or when the supporting leg is passed. They should be set solidly and squarely on the ground with toes pointing straight ahead. Any deviation from this procedure is a defect of action. See Figs. 5 and 7. This is not to say that all good horses must

Fig. 5. Straight, true action.

Fig. 6. Winding or rope walking.



Figure 5



Figure 6



have perfect action. Many compensate by intelligence, willingness, and practice; however, correct action would make them better horses.

### SOME COMMON DEFECTS OF ACTION

1. Winding or rope walking. A tendency to swing the striding leg around and place it in front of the supporting leg (Fig. 6).
2. Dishing or winging in. The striding foot swings inward in motion, then outward again at completion of stride (Fig. 10).
3. Interfering. Striking the supporting leg, usually near the fetlock with the foot of the striding leg (Fig. 10).
4. Paddling. An outward deviation in the fore foot and lower leg at flexion (Fig. 11).
5. Winging. Exaggerated paddling, most noticeable in high-going horses.
6. Forging. Striking the heel or undersurface of the shoe of a forefoot with the toe of a hind foot.
7. Rolling. Excessive lateral shoulder motion as with wide fronted horses.
8. Pointing. A low, long stride.
9. Dwelling. A perceptible pause in flight of the foot before it reaches the ground.
10. Trappy. A quick, high, short, jolting stride.
11. Pounding. Heavy contact, sometimes resulting from a heavy stride.

### SPECIFIC EFFECT OF LEG SET ON ACTION AND UNSOUNDNESSES\*

1. Pigeon toes tend to cause paddling or winging.
2. Splayed feet encourage dishing or winging in and may result in severe interfering and permanent injury.
3. Long, weak pasterns and shallow heels cause an irregular stride and may predispose to ringbone (Fig. 8).
4. Short, straight pasterns and shoulders, and deep heels are accompanied by a stilted, trappy stride and a tendency toward stiffness and sidebones (Fig. 9).
5. Long forearms, short cannons and sloping pasterns are conducive to long, springy, true strides and limbs that wear well (Fig. 5 and 7).
6. Calf knees increase concussion and encourage a pounding gait.
7. Buck knees cause unstableness, and when accompanied by long toes tend to cause stumbling.
8. Knock knees predispose to interfering.
9. Bow knees usually cause undue weight on the outside of the front feet which tends to hasten sidebones.
10. Sickie hocks seldom accompany balanced conformation and motion. They must bear a disproportionate share of weight; therefore, spavins and curbs tend to develop.

11. Post legs are less common than sickle hocks but are equally as serious. They seldom ride easy, are prone to crampy, boggy hocks and tend to cause low, skimming strides.

12. Bandy legs are usually unsteady or "limber hocked" and predispose to most unsoundnesses of the hock. Straight underpinning does not guarantee a good performing horse but it increases the probability of his becoming one.

\*See Extension Bulletins E-920 and E-921 for Unsoundnesses and Blemishes.



Fig. 7. Correct, true arc, balanced feet.



Fig. 8. Incorrect arc, long toes, flat heels.



Fig. 9. Incorrect arc, short toes, high heels.

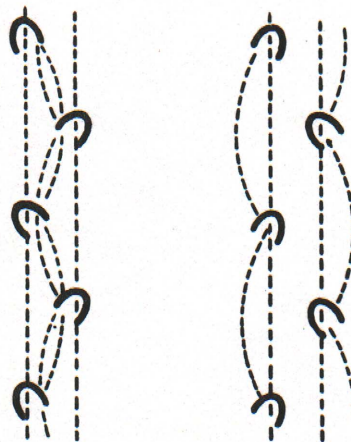


Figure 10

Figure 11

Fig. 10. Interfering or dishing or winging in.  
Fig. 11. Paddling or winging.



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Issued in furtherance of Cooperative Extension work in agriculture and home economics, acts of May 8, and June 30, 1914, in cooperation with the U.S. Department of Agriculture. W.J. Moline, Director, Cooperative Extension Service, Michigan State University, E. Lansing, MI 48824.

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