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Structural Defects of Cattle, Sheep and Swine
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Structural Defects of Beef Cattle, Sheep and Swine

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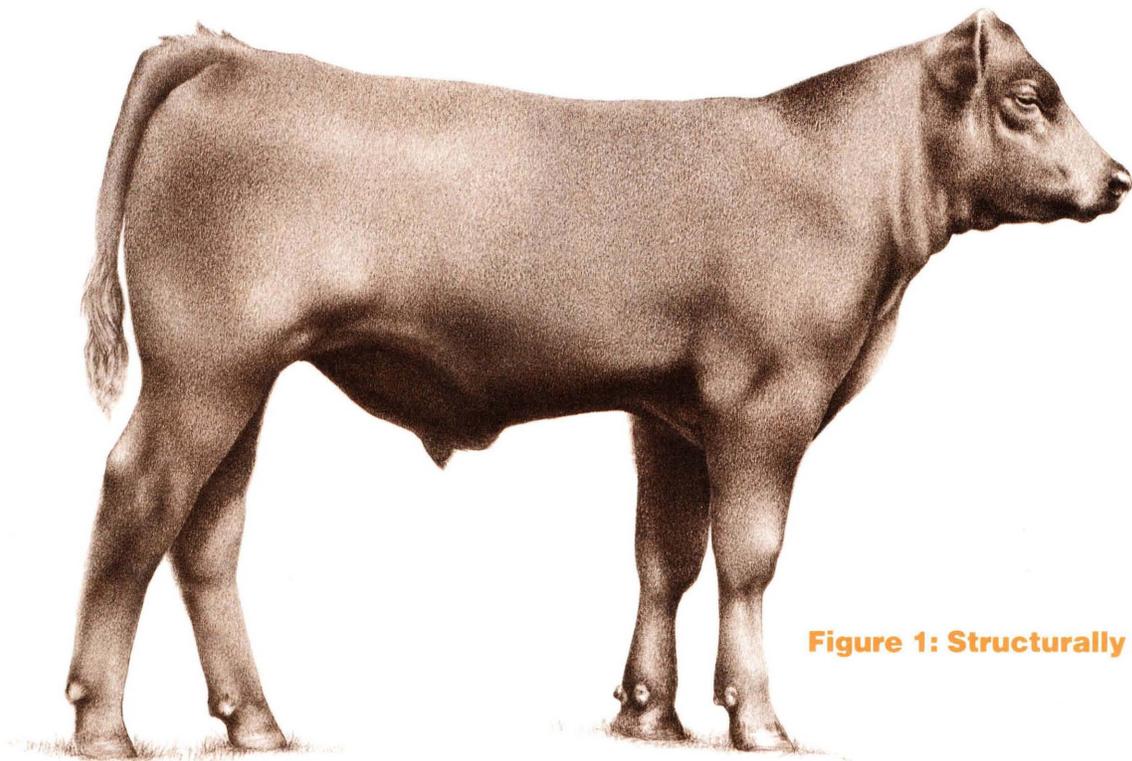


Figure 1: Structurally sound bull

Proper skeletal structure is essential for all livestock. Whether an animal is intended for breeding or for market, it must be able to walk properly. To ensure longevity of breeding stock, animals must be structurally correct and be able to walk freely to breed, graze and reach water under pasture conditions.

Structural defects can lead to impaired mobility, pain and eventually to unsoundness.

Anyone involved in livestock selection must be able to identify correct structure, observe defects and understand the seriousness of defects. The environment of animals can also play a factor in potential develop-

ment of structural defects. Modern swine production, for example, involves confinement housing and cement flooring. These housing characteristics can be stressful, making proper structure for pigs all the more imperative. Selection of sheep and beef cattle in recent years has resulted in some very large,

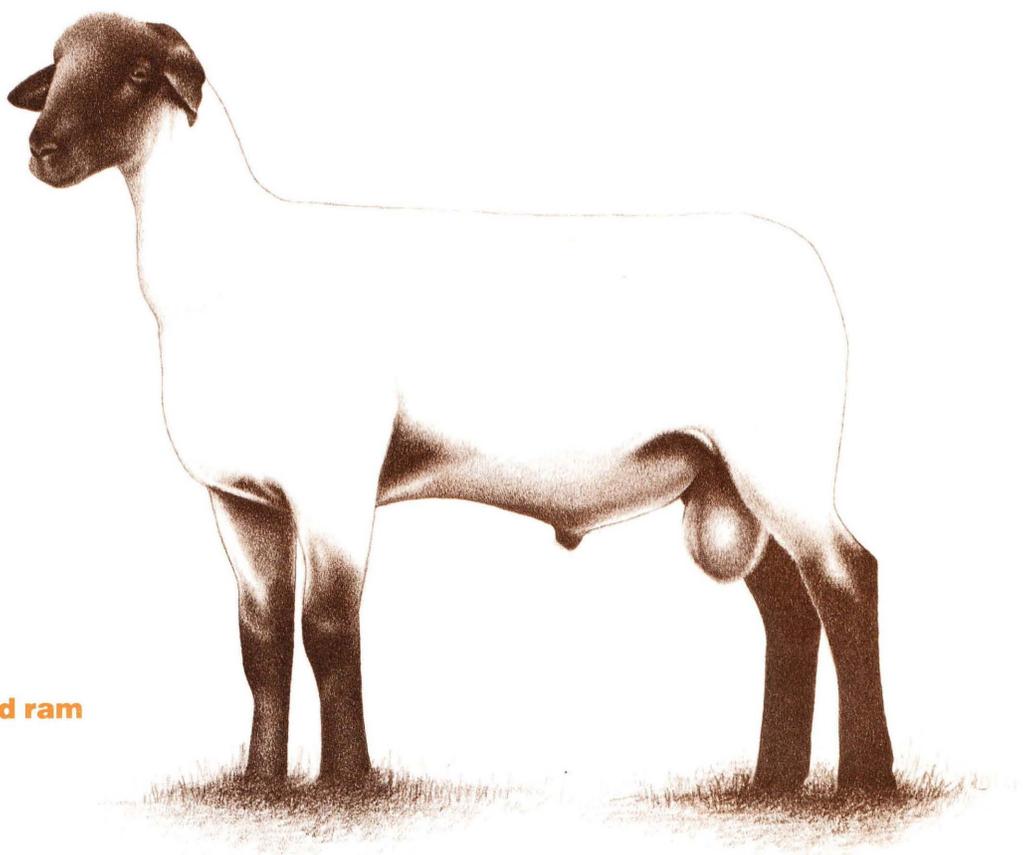


Figure 2: Structurally sound ram

heavy livestock. This has placed greater stress on the bones and joints of these animals, which makes proper structure even more critical.

To understand structural defects of livestock, one must be able to visualize correct structure. This bulletin will focus on common structural defects that occur in beef cattle, sheep and swine. Descriptions of some of the more common structural defects of these animals—arranged by anatomical location—are included, and some are illustrated. The key at the

KEY: (ALL) = ALL species
 (B) = Beef cattle
 (SH) = Sheep
 (SW) = Swine

bottom of this page will help you identify which defects relate to which species of animal.

Figs. 1 through 3 are correct examples of each of these species. Fig. 4 is a correct example as seen when viewed from the rear.

Front Legs and Feet

“Toes out” or splay-footed (ALL): An animal with this defect has front feet that are not parallel and point outward. Fig. 5 shows the front view of a knock-kneed, splay-footed heifer, while Fig. 6 illustrates a structurally correct steer. (See also “Knock-kneed.”)

“Toes in” or pigeon-toed (ALL): An animal with this defect has

front feet that are not parallel and point inward.

Buck-kneed, bucked over at the knees or over at the knees (ALL): A correct animal’s knee should be straight up and down. A knee that is forward of a line perpendicular to the ground would be termed “too straight at the knee, buck-kneed, bucked over at the knees or over at the knees” (Figures 7 and 8).

Calf-kneed or weak-kneed (ALL): An animal with this structural defect has knees that set too far backward.

Too straight on the pasterns (ALL): A correct pastern will have some backward slope. If the pasterns are straight, the animal will stand on only the



Figure 3: Structurally sound boar

front portion of the hooves. Figs. 7 shows a steer and Fig. 8 shows a gilt with this condition.

Weak pasterns (ALL): Weak pasterns have too much slope. Recently, some swine producers have advocated that pigs may be called weak on their pasterns when, actually, they are very sound. Consequently, pigs should not be criticized as weak on the pasterns unless the condition is very severe. In all species, if this condition is severe, the animal will not put any weight on the front part of the hooves. The hooves will not wear naturally and will ultimately grow very long.

Knock-kneed (ALL): This means that an animal's knees are too close together (see Fig. 5).

Shoulder

Too straight: (ALL): An animal's slope of the shoulder is evaluated by comparing the location of the shoulder's point with the top of the shoulder or withers. For this feature to be correct, there should be some backward slope from the point of the shoulder (approximately 45 degrees). The shoulder does not have to be straight up and down to be labeled "too straight." Fig. 7 illustrates a steer with this condition.

Open (B, SH): When viewed from the front, a properly structured animal has an "A-frame" shape. Thus, a proper shoulder on a beef animal or a sheep will be tight at the top of

the shoulder, nearly forming an upside-down "V." In an open shoulder, the right and left shoulders do not meet at the top of the shoulder; rather, a gap is apparent between them. An open-shouldered animal would have more of an "H"-shaped frame as viewed from the front.

Because of the sharp angle of the shoulder blades (as the animal is viewed from the front), a proper, tight shoulder would be considered angular and would be part of the general appearance terms such as "feminine" for ewes and heifers, and "smooth" for bulls or rams. An open-shouldered animal is often called "coarse." An open shoulder may be

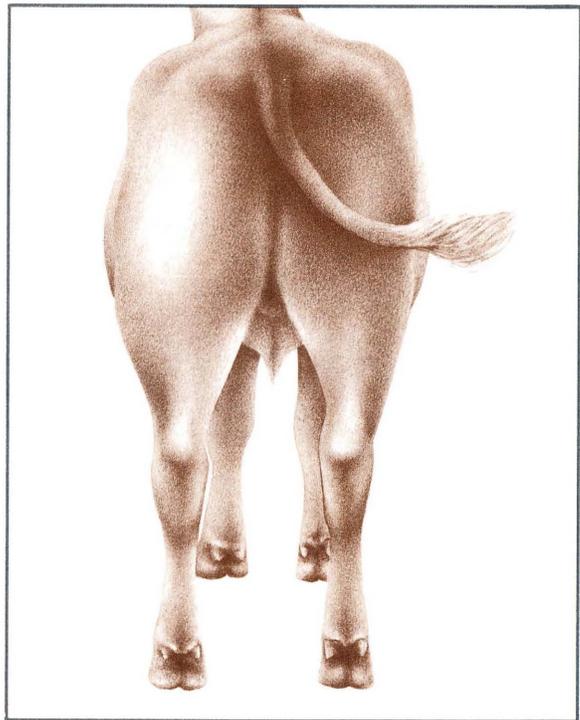


Figure 4: Rear view of structurally sound steer

associated with lambing or calving difficulty.

What is considered proper shoulder width for pigs, however, is much different than that for beef cattle and sheep. Swine are encouraged to have width between their shoulder blades, because this allows for more capacity. If a pig was identified as "tight-shouldered" based on the criteria mentioned above for a sheep or beef animal, it would almost always be narrow, light-muscled and too straight in the shoulder, knee and pastern. For pigs, having the spine set down between the shoulder blades usually is associated with more correct knee and pastern set, and greater soundness.

Breaks behind the shoulder (ALL): Even though shoulders may slope at a reasonably correct angle, an animal with this condition may have a dip or break just behind the shoulder. This condition, which may also be described as an "uneven topline," may appear unattractive, but it is not a serious functional defect. This is very common in straight-shouldered animals.

Out at the point of the shoulder (B, SH): An animal with this structural defect has a very prominent point of the shoulder, even though the shoulder may be very tight. This condition can also be described as "in at the elbows." It is almost always associated

with toeing out, knock knees or both.

Top of Spine

High-topped (SW): The shape of the top of the spine is much different in swine than in beef cattle or sheep. In the past, swine producers advocated a high, arching top as being correct. Now, however, a more nearly level top is almost always associated with improved soundness and greater freedom of movement. Pigs that are too high-topped can also be described as "high" or "tight" in the spine, while those that are more nearly level can usually be described as "loose-structured." Fig. 8 shows a pig that is high-topped.



Figure 5: Front view of knock-kneed, splay footed heifer

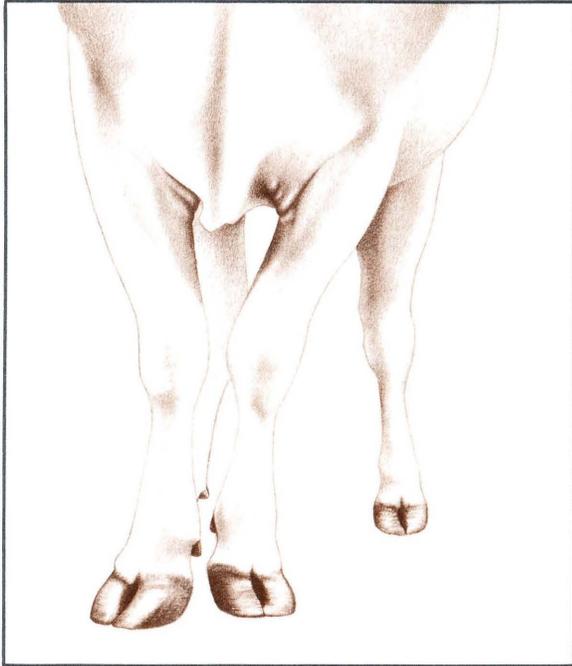
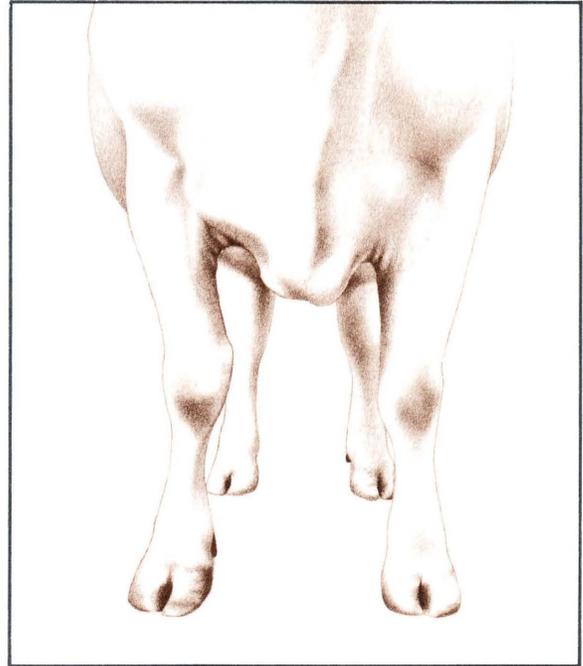


Figure 6: Front view of structurally sound steer



NOTE: It is improper to describe one animal as “leveler” than another. Levelness is an absolute concept that once attained, cannot be increased. Thus, if one animal is “level,” no animal can be “more level” or “leveler.” Since few animals are actually level, it is more important to describe one as being “more nearly level” than another.

Weak-topped (B, SH): Rather than being high-topped, many sheep or cattle are weak-topped, meaning their backs sag slightly. Though unsightly, this does not affect function very much. A correct animal compared to one in this category would be called “strong-topped,” “straighter-topped” or “straighter in its lines.”

High in the loin (B, SH): Some cattle and sheep will raise their loin slightly when they walk. This appears to be an attempt to relieve pain caused by another defect, usually a post-legged condition. This condition is sometimes referred to as “roaching in its top”; however, the latter term should be avoided when describing this condition, since it is neither specific nor descriptive of the condition.

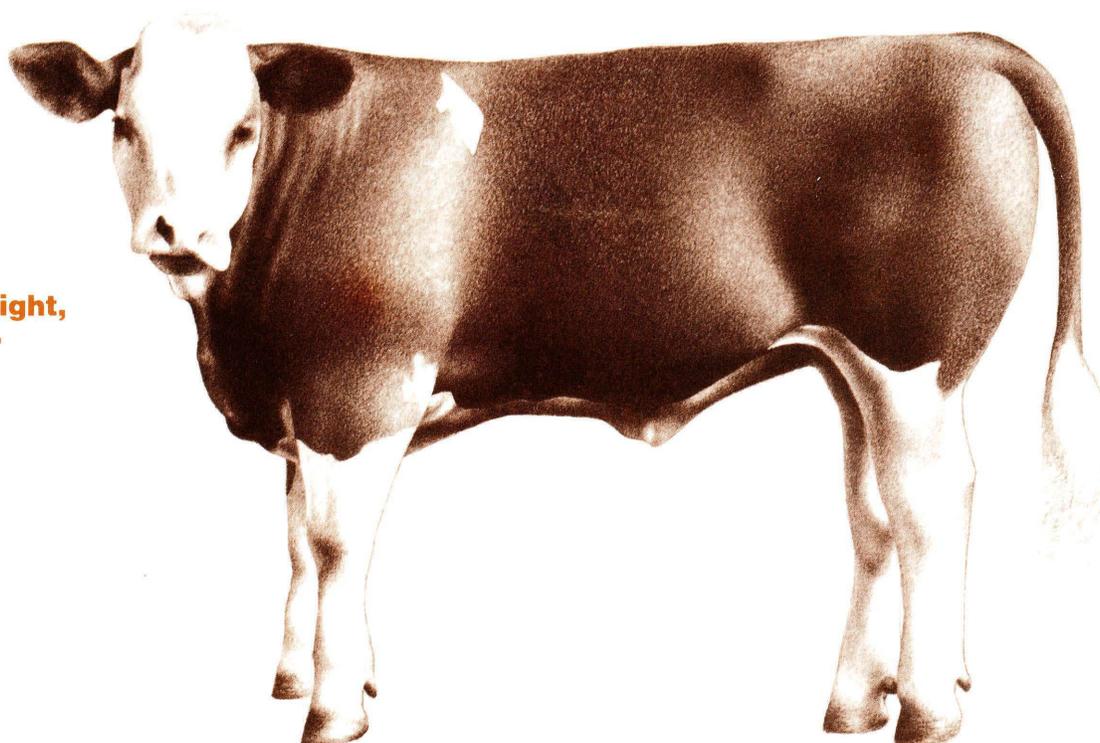
Rump

Steep rump, droopy rump or sloped out at the rump (ALL): Proper structure includes a long rump that is nearly level when viewed from the side. Slope is measured from the hook (hip)

bones to the pin bones (near the tail set). Many animals in all species droop from hooks to pins. A slight downward slope from hooks to pins may be desirable in breeding heifers or ewes for calving or lambing, and to ensure proper drainage of the reproductive tract. Fig. 9 illustrates a droopy-rumped heifer.

Peaked rump (B, SH): When viewed from behind, an animal’s rump should be square and uniform in thickness from the hooks backward. Many animals are much narrower at the pins than at the hooks. A wedge-shaped or peaked rump results partly from structural problems, but it can also be attributed to light muscling.

Figure 7: Too straight, post-legged steer



Narrow or close at the pins (B, SH): Self-decriptive—a reasonably high, wide pin placement is preferred.

Rear Legs

Sickle-hocked (ALL): As in the shoulders and front legs, some angulation of the rear joints is necessary to absorb shock, but too much angle or set to the hock is called “sickle-hocked.” Imagine a line from the pin bones to the dewclaw. In a correct animal that is standing properly, this line will pass through the bulb of the hock (the rearward portion). If the hock is behind the imaginary line, the animal has too much set to the hock.

A sickle-hocked animal is not as attractive as a correct one, but unless this condition is severe, it will not impair performance. Fig. 10 illustrates a sickle-hocked heifer. Compare this with the structurally sound bull in Fig. 1.

Post-legged (ALL): This is a severe defect involving a hock that is too straight. Based on the imaginary line discussed above, if the hock is ahead of the line, the hock is too straight. (Figures 7 and 8).

Straight or weak pasterns (ALL): See “Too straight in the pasterns” and “Weak pasterns,” (Front Legs and Feet).

Cow-hocked (ALL): With this defect, hocks bow inward and are closer together than the feet

when viewed from behind. Hocks and cannon bones should be parallel. Often, a cow-hocked animal will also be splay-footed. (See Fig. 11.)

Bow-legged (ALL): An uncommon defect where the hocks bow outward.

The Relationship Between Structure and Movement

It is important to understand the relationship between form and function to evaluate livestock. The justification for selection of structurally correct livestock does not lie in aesthetics, but rather in the fact that correct animals are more able



Figure 8: Too straight, high-topped gilt

to perform the tasks that are required of them.

Now that you are aware of many structural defects, try to imagine how they will affect movement. Often, many problems will be related. The most serious complex of problems are those that arise from too little angulation of the skeleton. For example, a post-legged animal will usually be too straight in the shoulder and knee, as well as on both fore and rear pasterns. A pig with these problems will usually be high-topped (Fig. 8). Cattle and sheep that are too straight may lift their loins when moving. All species with these problems will move very stiffly.

There are two reasons for this. First, these animals' structures will not allow a long, free stride. When the shoulder is too straight, the foreleg cannot reach far enough forward to take a long step. Neither the hock nor the knee will allow a long reach, and the straight pasterns will not allow a long follow-through. The result: a very short, choppy stride.

Secondly, movement is often painful for animals that are too straight (Figs. 7 and 8). When the joints are too straight, they must absorb all of the stress of a step down. With proper angulation, stress is spread over bones, joints, tendons and muscles. In the post-legged animal, stress on the joints can become tremendous. Even

flexing joints will become painful, and the animal will take short, choppy strides to avoid flexing the joints any more than it has to. This is especially a problem for breeding males when they must mount a female.

The problem of too-straight structures is quite common in all species. Breeders of most breeds of beef cattle and sheep have placed a great deal of selection emphasis on frame size. Over recent years, many livestock producers have selected breeding stock with less than adequate angulation of the joints because these animals are taller than animals that have correct structure. If these producers would imagine straightening the shoulder,

Figure 9: Weak-topped, droopy-rumped heifer

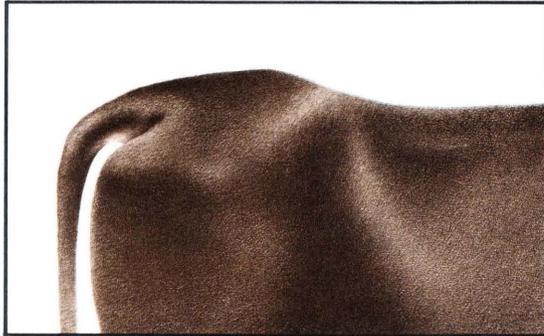
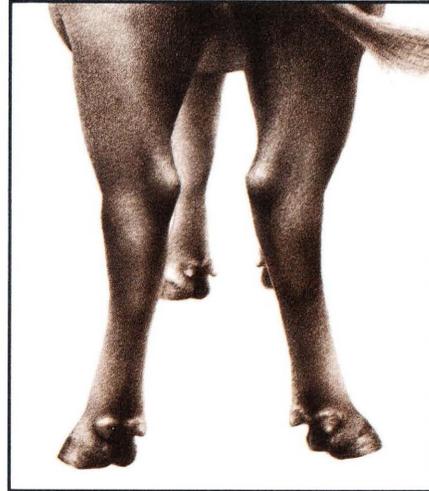


Figure 10: Sickle-hocked heifer

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Figure 11: Cow-hocked, splay-footed heifer



hock, knee and pasterns of a correct animal, they could easily see how the animal would stand an inch or two taller without any real change of size.

On the flip side, over-angulation of the joints (sickle-hocked—see Fig. 10; weak pasterns) may result in abnormal stance and hoof growth. However, the problems associated with this defect are seldom as severe as those related to a too-straight structure.

For more information on how to evaluate and judge livestock and diagram of anatomical structures of livestock, see Extension bulletin 4-H1151, *Livestock Judging Guide*, available from your county Cooperative Extension Service office or the MSU Bulletin Office, P.O. Box 6640, East Lansing, MI 48826-6640.

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