

A Strong Foundation: Proper Hoof Structure

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This month's article from Dr. Bates discusses the importance of having firm scientific evidence for the benefits of management practices that we suggest. Just like Extension educators have to rely on proper research to make sure we do not make suggestions that negatively affect your bottom line, cattle must have a solid foundation (good hoof structure) if they are going to last in the herd. In the end, cattle are accountable to their genetics and environment and we are accountable to you. More attention in research and education has been focused on hooves in bull and replacement female selection lately.

Screw claw is one of the most often cited reasons for culling based on hoof issues. Last December, Dr. Sarel Van Amstel gave a presentation at the UT Bull Test Open House about guidelines for selecting cattle with good "feet." In that discussion, he outlined the fact that there are two causes of screw claw. One cause is genetic (or heritable) and the other is acquired (or environmental). It is likely that there is an interaction between these two causes such that some cattle are genetically more susceptible to acquiring the condition.

In very simple terms, genetic screw claw develops because the bones inside each toe of the hoof are set at an abnormal angle causing curvature of the outside hoof wall and rotation of the toe. Diagnosing heritable screw claw requires looking at the cow family, the bull, how old the animal is when you first detect it and some other history of the animal. The typical signs are toe rotation on the outer claw of the rear leg and curvature of the outside wall. Since it is highly heritable, cattle from cows and/or bulls with screw claw will likely show it at a relatively young age. And if you are certain that they were not over fed at any point in their development, you can assume it is genetic.

Laminitis and damage to the horn producing tissues of the hoof can lead to acquired screw claw. This happens most often in situations where cattle are fed to gain at high rates for either a short period of time or for several months. Intensive feeding regimens are often associated with confinement lots which accelerates the situation. Again, some cattle are genetically more apt to develop screw claw under these situations and it can sometimes be difficult to separate the two issues. To make it simpler, the most striking comment that Dr. Van Amstel made was that "rear feet malformations are heritable while poor front foot structure is related to environment."

Selecting young bulls with good hoof structure will help reduce the occurrence of screw claw in the replacement heifers they sire. This requires some detailed investigation because most bulls are purchased young enough that, even if they are genetically predisposed to screw claw, they will not show it at the time of purchase. But, there are ways to select bulls that are less likely to have it based on visual appraisal of their current hoof structure.

First, observe the bull's hooves on a hard surface where the entire foot is visible (out of the mud or bedding). They should have a large foot relative their size and weight with a wide weight-bearing surface. The toe should be at a 50-60° angle and about 3 inches long. Make sure that the outside edges of the toes do not turn or roll under where they meet the ground and that there is no

rotation to the toe itself. The back part of the hoof (the heel) should be at least 1.5 inches tall. Also, make sure there are no grooves on the hoof wall and that the space between the toes is not excessively wide.

If the bulls' feet have been recently trimmed, it will be difficult to determine if they will have any issues as they mature. Ask the owner or bull test manager why they were trimmed and if they will replace bull that develop issues. But, remember that heifer they sire would be likely to inherit feet and leg issues even if the bull looks fine the first season it is used.

The UT Bull Testing program at the Middle Tennessee Research and Education Center in Spring Hill has implemented a hoof scoring program under the guidance of the Tennessee Beef Cattle Improvement Association. The system is based on methods developed in Australia for dairy cattle hoof soundness. Basically, it assigns a numerical grade to both the front and rear hooves based on how much they differ from the ideal angle and heel depth. If the average from three separate evaluators does not meet the minimum criteria, the bull is not offered for sale. We hope this will add even more value to these bulls and help ensure that the replacement females they sire remain productive longer.

Referencing back to the comments about sound research as the foundation of our efforts, we are taking steps to make these measures even more precise. Future plans include developing imaging systems and computer software that will calculate exact measurements rather relying on subjective visual appraisal. The prototypes for this equipment will be tested this year and compared to current methods.