

# Visual Appraisal of Beef Cattle

by Grant Alexander

The fall shows are now over and everyone is home again and getting back into their normal daily routines. I'm sure there are some who are still having the occasional "arm chair analysis" of what happened at the shows. I took some time and watched the shows of several breeds and came away very impressed with the quality of cattle that were displayed. The depth of quality in some of these shows was truly remarkable. Some of the classes (our breed included) didn't have an animal in them that you would call inferior - they were just variations of good. Many times the difference between first and fifth was very small and really only amounted to personal preferences.

The judges at these shows were all very knowledgeable cattle men and women. In most cases they seemed to be selecting very similar types, regardless of the breed. This is probably a good thing. It indicates to me that most breeds are trying to select cattle that will be useful to the industry. The thought does cross my mind of what our shows will look like in ten years time. Ten years ago, there were some major differences between the breeds, however the differences seem to be narrowing, especially in traits like frame size, thickness and fleshing ability. I firmly believe that good cattle are good cattle regardless of their color or breed, however these trends do make me wonder if the distinctive qualities each breed possesses will in time be diminished - just some food for thought.

A couple of trends more visible this year are a little concerning to me. It appears that some breeders are trying to add some extra thickness via the feed bucket, especially in some of the younger heifer classes. Some of these young females are carrying what I consider to be too much condition for their age and I have to wonder if it will end up affecting their reproductive and milking abilities when they enter production. I do not think that the Shorthorn breed has gone as far in this direction as some breeds yet, but we've been known to follow the lead of others in the past.

There are also some cattle making it to the top ends of their classes that are carrying a lot of extra baggage in the lower third of their bodies. In some cases this is happening because the judges are trying to find the easy fleshing cattle. Don't take me wrong. I think that fleshing ability is an extremely important trait that

should be selected for. I personally think we have to use some caution and make sure that we are selecting the right cattle that possess this trait. As many of you will remember, we have been down this road before and I don't think we want to "go there" again. It took us years to dispel the perception that Shorthorns were wasty, poor-muscled cattle. There are still some out there that still think this is the case.

With this in mind, it may be appropriate for us to review some of the basic facts about beef cattle that have been well documented over the years. Some of this information comes from an article which was printed in the August 1977 Shorthorn News. It's as true today as the day it was written.

Fact#1 - all cattle are composed of the same three tissues - bone, muscle and fat.

Fact#2 - all cattle have the same number of bones and they are located in the same relation to each other. They are almost identical in shape and on a percentage basis, represent almost the same proportion on all carcasses. On the other hand, the other two tissues - muscle and fat - vary greatly.

Fact #3 - all cattle have the same number of muscles. They are attached to the skeleton in the same location in all cattle. What varies is the shape and size of these muscles.

Fact #4 - the correlation between the weight of a single muscle with the total muscle in the carcass is extremely high (.95-.98). This means that when you select for increased muscle in one area (for example, rib eye area), you will also increase the muscle in other areas by nearly the same amount.

Fact #5 - muscle moves when the animal walks. Fat is inanimate. Fat hangs and shakes while muscles move and bulge. Muscles are round. Therefore, a well muscled animal will have a round shape to its top, not a flat shape.

Fact #6 - it costs much more to put on a pound of fat than a pound of muscle. Most research indicates that it is 6 to 7 times more expensive. We all know that a certain amount of fat is required on the carcass and it

is very desirable for it to be well marbled. Marbling is the small seams of fat in the muscle tissue and it is an important factor in the taste and tenderness of the meat.

### Use of the skeleton as a reference point

#### 1) Freedom of Waste

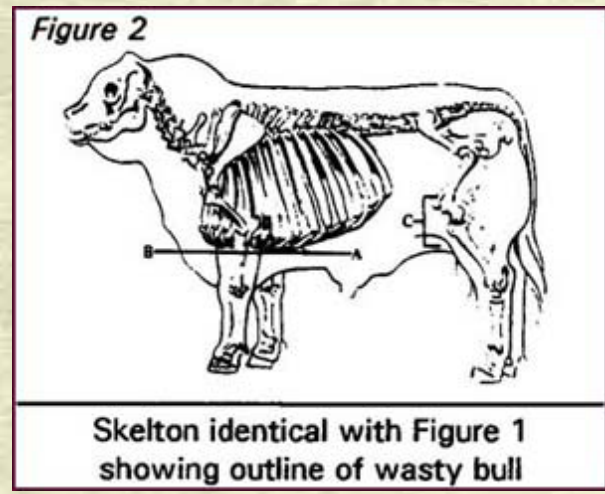
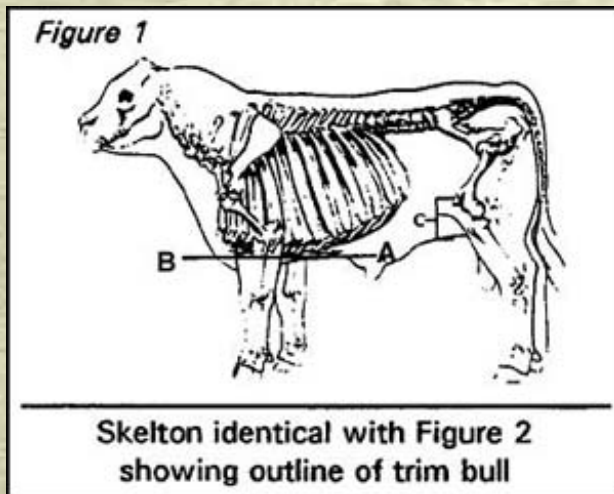
The knowledge that the muscles are attached to the skeleton at the same points and in the same relation to each other in all cattle makes the skeleton an excellent reference point for determining muscle development. Likewise, the fat is deposited on the skeleton and musculature in certain definite area and so again we can use the skeleton as a point from which to measure the amount of fat.

Most cattlemen know that if they handle cattle over the point of the shoulder, over the backribs and along the tips of the backbone or spinous processes, they can measure the fatness of the animal because no muscle is ever found in these areas. Any tissue found in these areas has to be either the hide or fat. Oftentimes, it is not possible to handle every animal, so you have to learn to visually appraise the amount of fat by looking at the areas where only fat is deposited. Fat is deposited in cattle first in areas where there isn't very much muscle movement such as the brisket, flank and twist areas. These areas can be used to visually appraise how much fat the animal is carrying. The animal will deposit a layer of fat over most of the body once these areas start to fill up.

Almost all of the fat that is deposited in the above mentioned areas, not only costs you a lot to put there, but it costs the packer money to trim it off. The marbling fat is usually put on the animal last. There are some breed differences as to how quickly this happens and this is extremely important for us as Shorthorn breeders to realize. All cattle will develop some degree of marbling providing they are fed for long enough periods of time.

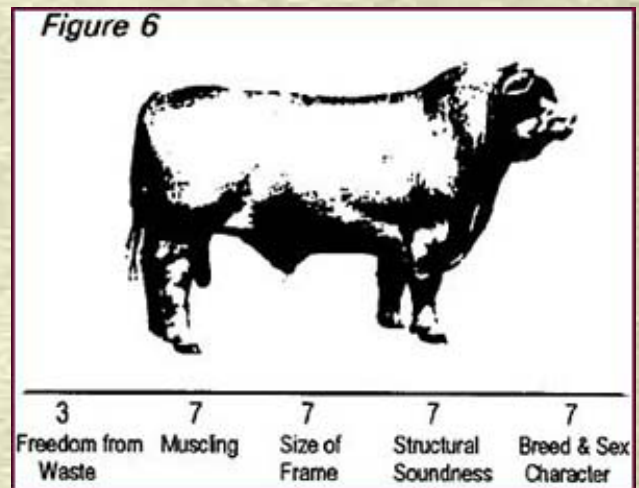
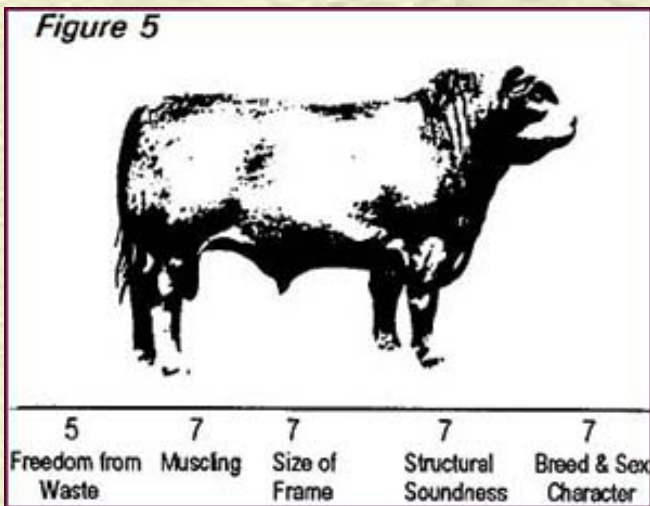
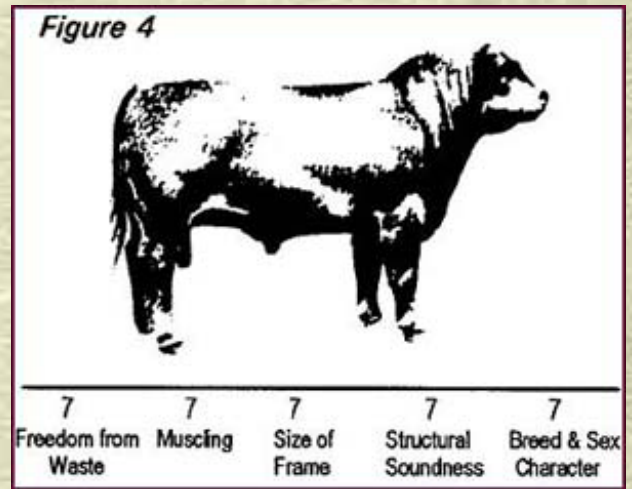
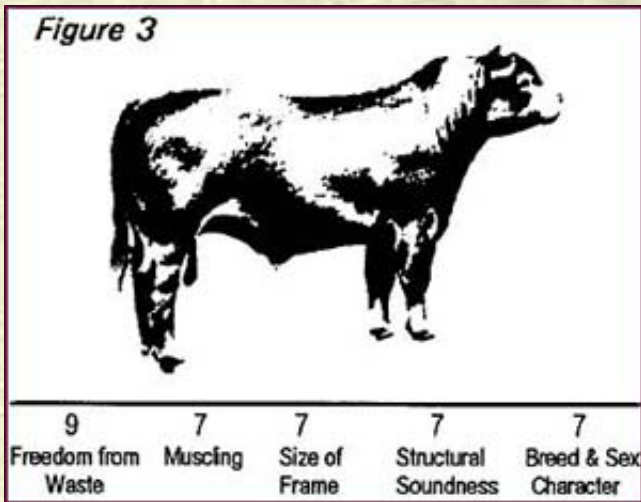
Shorthorn cattle have the genetic ability to put on the marbling fat faster than some other breeds. This is what impressed the people at Cargill when the results of the Alberta feeding trial were completed. There are some within breed differences for the marbling trait, just like there are for any other trait. The packers know this breed has an undeveloped market advantage on its hands. They can't figure out why we aren't identifying the lines that have the genetic advantage to marble, as this is an extremely important economic trait. The packers are very cautious to not promote one breed over another, and they are right to think this. This is each breeds job to do.

Take a look at figures 1 and 2 to get a better idea of how the skeleton can be used to analyze the amount of fat



and muscle and animal has. Draw a horizontal line approximately 3/4 of the distance from the knee joint to the top of the elbow (a-b in the diagram). This line can be used to evaluate the waste (i.e. fat) that an animal carries. Any tissue found below this line, when viewed from the side or front, is either loose hide or fat. No muscle is found in the brisket or flank area below this line. Therefore, these become great places for fat to be deposited. The abdominal wall consists of thin layers of connective tissue and muscle, and contrary to the belief of some, does not extend into the flank area, but curves upward and attaches to skeleton above the stifle joint. Some will argue that high flanked cattle are Apoor doing@ cattle, however, I have never seen any research that indicates this. My

own thoughts on this, with nothing but personal experience to go on, is that going to the extreme in any direction, is usually not the best. What I do know, is that a deep flank can make an animal look prettier, but that's about all it does. It is just another great place for the animal to deposit fat.



Let us examine Figures 3, 4, 5, and 6.

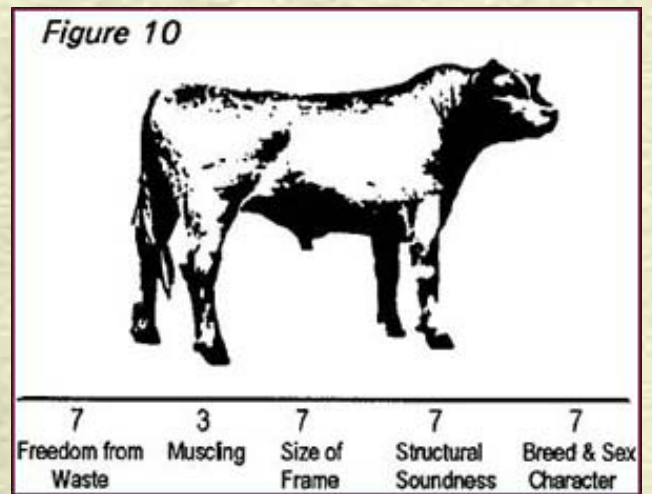
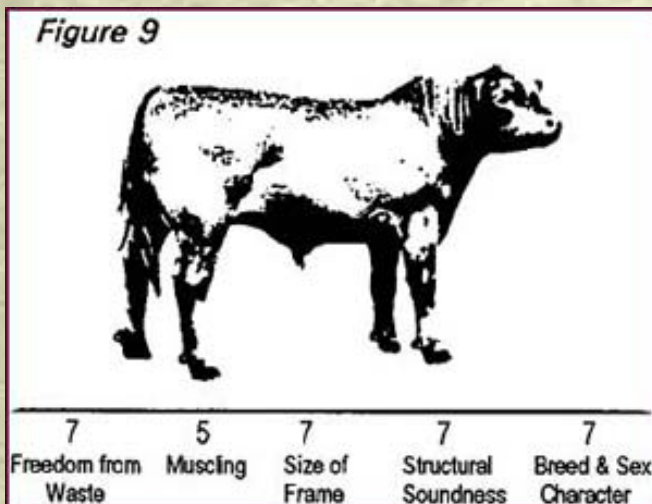
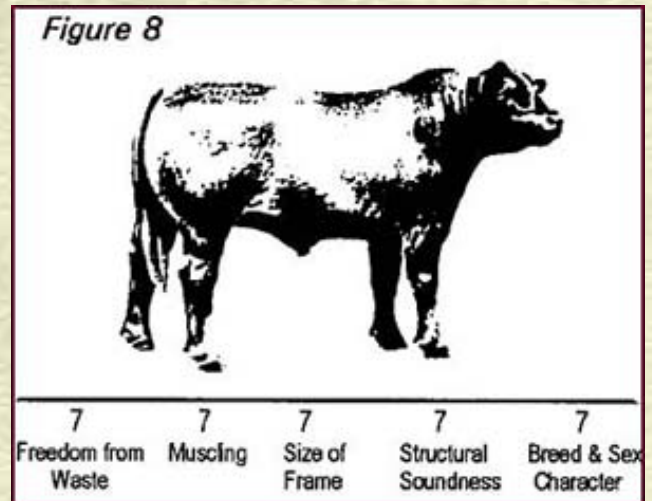
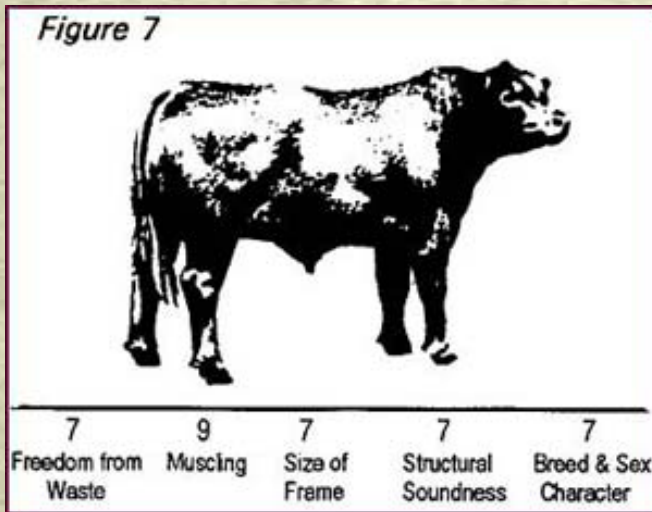
Notice that they are scored identically for all traits except for freedom from waste. The bull in figure 3 appears to be longer, taller and shallower. If you take a ruler you will find that the bulls in all four diagrams have identical skeletons. They measure the same from nose to tail, height at the withers and knee to the ground. There is progressively more depth of body as we go down the page, but this is not due to greater capacity of rib cage or abdominal cavity, but rather due to loose hide that is filled or will fill with fat. Note also that the bull in Figure 3 appears to be longer necked than the bull in Figure 6. This is an illusion as they are identical in the length of their necks. As you move down the diagrams, the only thing that changes in the neck areas is the amount of loose skin in the dewlaps. Also notice that as the cattle become wider, they appear to be smoother topped, squarer in their underlines. Each of these bulls are identical in their muscular development so this smoothness and straightness comes from fat deposits.

Here's another point to remember. When cattle approach maturity, they grow less muscle and increase the rate of fat deposition. This is why shorter bodied, shorter legged cattle mature and fatten faster. Some of the trends we see coming out of some of the major U.S. steer shows should be sounding the warning alarms within the industry. Again, I don't think we want to "go there", as we've been there before and it really isn't that pretty.

## 2) Selecting for Muscling

The same principle used to determine fat or waste can be used to identify muscling. Since the size and shape of the skeleton varies only slightly you simply look at the points of the skeleton where there is only muscle to compare

the muscling between animals. The forearm and the stifle areas are good places to make these comparisons. Let's look at the animals in Figures 7, 8, 9 and 10. In these animals all traits are the same except for muscling. Notice that as the muscling score decreases, the forearms become narrower, straighter, and flatter. There is less bulge in the muscles over the shoulder and in the



stifle area. The loin becomes flatter and the round more concave or has less bulge. The heavier muscled animal has a more prominent shoulder and stands relatively wide. The poorer muscled bull has a very flat smooth shoulder and stands narrow. The well muscled animal is thicker down low in his body than he is at the top. When standing behind a well muscled animal the widest part of its body will be through its stifle region. Poor muscled cattle will be wider on top than lower down. Remember that in live animals, you can see the muscles move when they are walking. When you are walking your animals in the show ring, the judge should be analyzing their muscling as well as structural soundness. This is also probably the best method of seeing how wide an animal walks and this is a good indication of muscling as well.

The key word in this discussion should be OPTIMUM. Like most things in life, too much of a good thing isn't always the best. It has been documented time and time again, that muscling and reproductive traits antagonize each other. This is why the real heavily muscled breeds are not known for their maternal traits and fertility. Age at puberty, which many consider to be one of the most important economic traits, increases as muscling increases. The thing to remember is that it is important to find that optimum level where muscling and reproductive traits can live together, so to speak. We have proven time and time again that we can improve the muscling in our Shorthorn cattle and still keep our fertility and maternal traits. There are probably limits to this and we must be careful not to jeopardize our strong maternal and reproductive traits in pursuit of muscling. We have in this breed an opportunity to produce cattle that combine most of the things the beef industry is wanting. It is our job to identify the superior cattle, and then produce them in quantities that will make them useful to the industry.