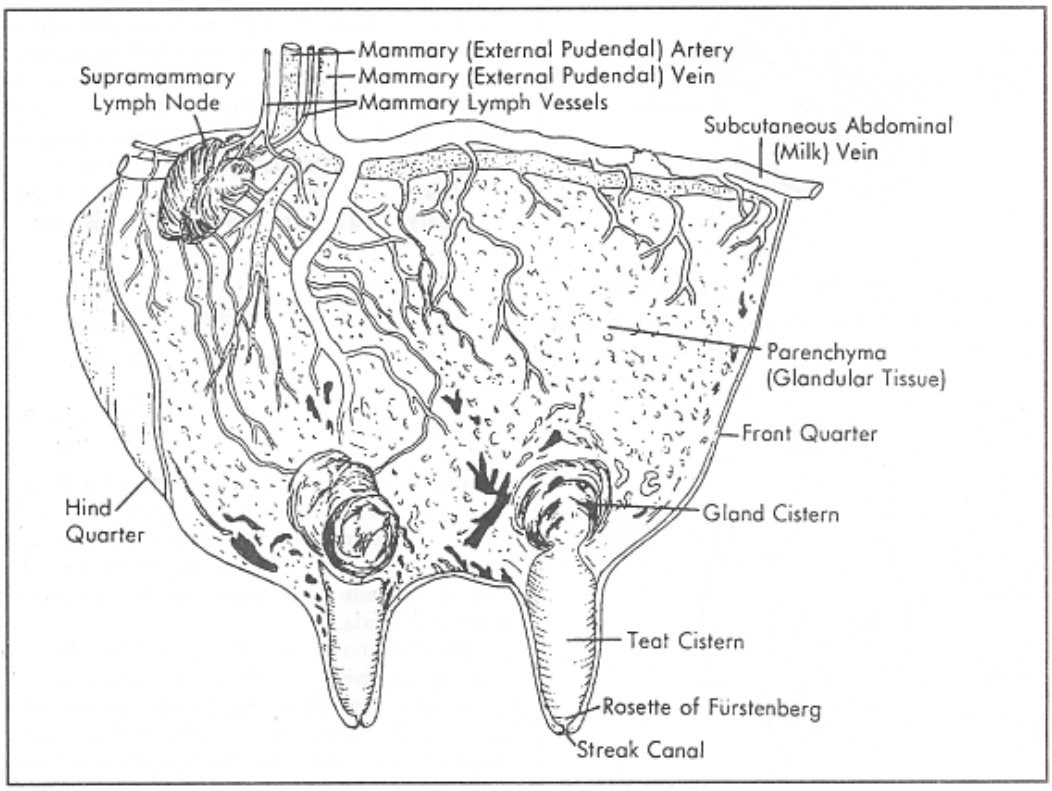
47447 UDDERS

This month's article on beef cattle conformation and structural correctness focuses on the cows' udder. We are all producers of Devon cattle, which have shown to be fertile, docile, and efficient cattle that last a long, long time. It would be a shame for a cow that would breed into her teens to be ruined by the time she is five because of poor udder structure. (Milk quality and volume are both critical for raising calves that will reach their genetic potential, however, that will be in another article. What this article is about is structural correctness of the cows udder).

What does a good udder look like? Most novice breeders think that the bigger the udder, the more milk the cow will have and thus the bigger calf she will raise. I would ask you, when is bigger ever better in livestock or agriculture?

ANATOMY OF THE UDDER



The cows' udder consists of four entirely separate quarters. The udder is separated by a membranous wall called the medial suspensory ligament. This ligament is composed of elastic tissue that extends between the halves of the udder. Numerous branches, called lamellae, extend from this ligament into the quarters. As the udder fills with milk, it expands making room for the milk being stored. The front and rear quarters of the udder are divided by a very thin wall of connective tissue.

The elasticity of the medial suspensory ligament directly affects the appearance of the udder in high yielding cows. If central udder support is weak, then the udder will become pendulous and the teats will face outwards, causing not only difficult milking/nursing, but also increasing their susceptibility to injury and contamination by dirt and bacteria. The udder can fill forcing the cow's hind legs apart, making walking difficult, and the surplus of milk causes milk-engorged teats to project outwards. A strong medial suspensory ligament is essential for udder conformation. A weak medial suspensory ligament results in a lowering of the

floor of the udder, sometimes below the hock which makes it more difficult for the calf to nurse and the teats may drag in the mud when the cow walks; the teats may be suspended inward or outward when filled with milk instead of straight down.

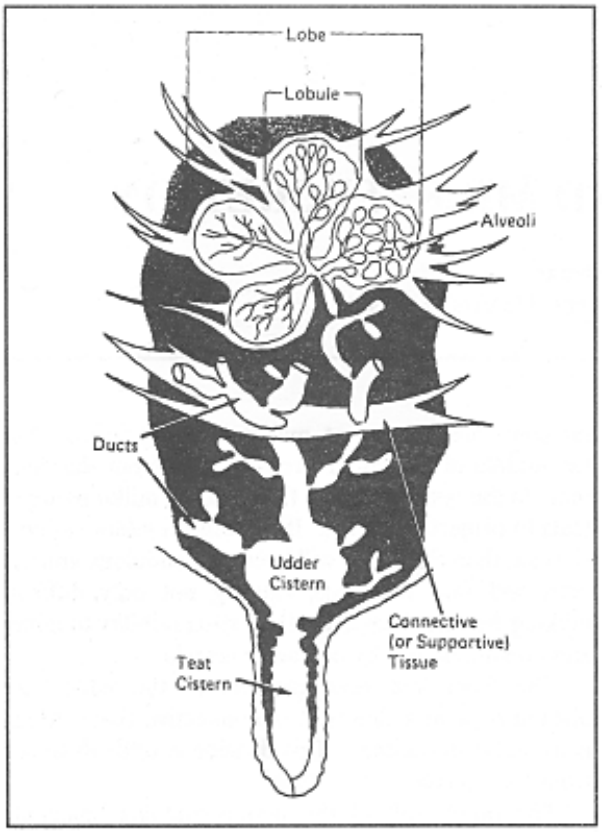
The outer udder wall contains ligaments which connect to the muscles of the hind quarters of the cow. The milk producing parts of the udder are supported by connective tissue which web throughout the udder. Some cows may have large udders, not because they are high producers, but because of a high content of connective tissue. This allows less space for milk-secreting tissue. Udders which shrink noticeably and become flabby after milking contain little connective tissue. Furthermore, cows that become obese at some point in their lives will deposit fat throughout their carcass including in their udder and milk yield is lessened. If you look at your cow and see fat deposits around the tail head and in the brisket, you can assume that they are also in her udder and reproductive tract (both of which negatively impact cow performance).

Each of the four quarters contains a separate mammary gland which, in turn is composed of: secretory tissue (alveoli), a duct system (interconnecting tubes), two cisterns, (storage areas), and a teat.

THE TEATS

Milk is removed from each gland by the streak or teat canal which is 8 to 12 mm long. Teats should be medium in length and cylindrical in appearance. The diameter should also be consistent from the top of the teat to the bottom with the end of the teat being rounded. The teats should be placed in the middle of each quarter and point perpendicular to the ground. Teats are kept closed between nursings by a sphincter muscle near the tip. This muscle is important not only in keeping the milk in, but also in preventing bacteria from entering. The character of the sphincter is important to the cow's productivity. If the canal is small, or if the sphincter is unusually strong, then the cow is hard and slow to milk. At the opposite extreme (large canal, or weak sphincter), milk will leak from

the teat between milkings and the udder is then open to invasion by mastitis-causing organism.



TEAT CISTERN

This cavity of the teat, located just above the streak canal, stores the milk which drains from the gland. It normally holds 15 to 40 ml of milk, depending on the size of the teat.

GLAND CISTERN

The gland cistern is located just above the teat cistern and is partially separated from it by folds of tissue. Although the udder cistern varies in shape and size between quarters and cows, it stores about 500 ml of milk.

DUCTS

A number of large ducts branch off from the gland cistern. These ducts branch into smaller and smaller ducts (similar to roots of a tree) and finally into the small ductules that drain each alveolus.

The function of the duct system is to collect the milk from the secretory tissue, to store part of the milk between nursings and to transport of the milk to the gland cistern.

Where the milk ducts branch-off from a larger duct, a narrowing of the tube occurs. As the lobules (milk secreting glands) fill up with milk, their weight causes them to sag downwards. This causes the narrow branch of each duct to be pinched and close. Consequently, milk does not drain from the udder until the cow is stimulated to let-down her milk.

SECRETORY TISSUE

The main milk-producing unit is the alveolus. This is a microscopic structure; almost spherical in shape, the outer surface of which is lined with a single layer of

epithelial (milk-secretory) cells and has a tiny duct to allow the milk to drain out The alveolus thus resembles a grape with its stalk. The outer layer also contains a complex of tiny, muscle-like cells called myoepithelial cells.

What is the style of udder we should be looking for?

Look for an udder with plenty of capacity to feed a good calf adequately. A quality udder well attached fore and aft is not at all pendulous, molded to the body, and has ideal sized teats. The ideal teat is 1" across, 2" long, and is dark in color. Neither the udder, teats, nor bag should protrude below the navel. The teats should also be evenly spaced on the quarters and point down.

The attachments should form a more or less continuous curve from the belly to half way up the back of the tail. This means no straining on the tissues from pendulous action and movement. The udder should be high enough for the calf to find easily when it first stands up and puts its head up to suck.

The teats must be small and not have too much capacity so that the calf can recognize them for what they are. The calf should have to work reasonably hard to get a feed, so that plenty of digestive juices are mixed with the milk to avoid scours and digestive upsets. The teats should not easily be damaged. I have seen teats 4" across and 6" long, that looked like balloons.

Dark colored udders and teats are important because sunburned udders occur, and darker further south. White surfaces are sun-sensitive, and in intense cases when exposed to the sun, or its reflection off of snow and ice, the whole skin on the udder can peel off. The cow is thus frantic with pain when the calf goes to suckle, and consequently the mother cow dries up.

A Description of Scoring Udder Suspension and Teat Size

An evaluation system for udder soundness has been developed and used by some breeds. Teat shape and udder suspension are the two primary characteristics evaluated.

The ideal time to udder score beef cows is within the first 24 to 48 hours after calving as she begins to freshen. Udder conformation will decline as the female ages, but do not take age into account when assigning an udder score. The following udder scoring system was developed by the Beef Improvement Federation. This scoring system categorizes udder suspension and teat size. A teat score of 9 (very tight, highly desirable) to 1 (pendulous, not desirable) for udder suspension and a score of 9 (very small) to 1 (very large) for teat size.

The scoring system doesn't account for teat and udder pigmentation. Pigmentation is desirable as it is a guard against sunburn of the teat and udder that can be caused by direct sunshine or reflection of the sun off snow.

The general rule for evaluating udder suspension is that the tighter to the body cavity that the udder is placed, the more desirable. This allows for the calf to more easily locate the teats and it is less likely for the teats to drag in the mud.

Udder Suspension Score 9: The udder is placed tight to the body cavity, well above the hocks and close to the body cavity. The quarters are mostly level from the side and rear view. The udder has high rear attachment and the median suspensory ligament is pronounced.

Udder Suspension Score 7: Similar to an udder suspension score of 9, but the udder is suspended slightly farther from the body cavity. The median suspensory ligament is pronounced keeping the udder level and suspending the teats perpendicular to the ground and above the hock. Because the medium suspensory ligament is pronounced, the teats suspend perpendicular to the ground when filled with milk.

Udder Suspension Score 5: The medium suspensory ligament is less pronounced and the udder is suspended farther from the body cavity. The teats begin to splay slightly outward when engorged with milk because of the weaker ligament. Also the quarters may not be level. An udder suspension score of 5 is likely the commercial cow average score.

Udder Suspension Score 3: The median suspensory ligament is vague resulting in loose attachment of the udder. The udder is suspended down to the hocks of the cow meaning that the teats reside below the hock. The quarters are not level and teats splay in an outward direction that is very pronounced when engorged with milk. Intervention may be required at calving. Replacement heifer retention from these dams is discouraged.

Udder Suspension Score 1: The median suspensory ligament is absent resulting in a loose and pendulous attachment of the udder. The udder suspends below the hocks and teats reside below the hock. The quarters are not level and teats are not perpendicular to the ground when filled with milk. Intervention is required at calving. Intervention definitely required to avoid a spoiled quarter or mastitis. Replacements should not be kept from these dams and producers should cull these cows.

Teat size can vary considerably. As teat size becomes smaller, more symmetrical, and more central in placement on the quarter, it is more desirable. Teat size can be generally categorized as very small, small, intermediate, large, and very large. It is seldom that cattle have the very small teat size. More common are the small, intermediate, and large teat size. As teat size becomes larger they tend to be thicker, less symmetrical, and suspend below the hock.

Teat Score 9: Teats are very small in length, rounded at the ends, and symmetrical. Teats are located in the center of the quarters and face perpendicular to the ground.

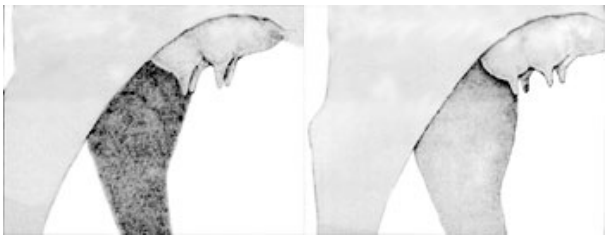
Teat Score 7: Similar to teat score of 9, but the teats are longer. Teats are located in the center of the quarters and face perpendicular to the ground.

Teat Score 5: Teats are longer, larger in diameter, appear to be thicker, and are less symmetrical compared to teat size 9, 8, 7, and 6. They may not be perpendicular to the ground or centered on the quarters.

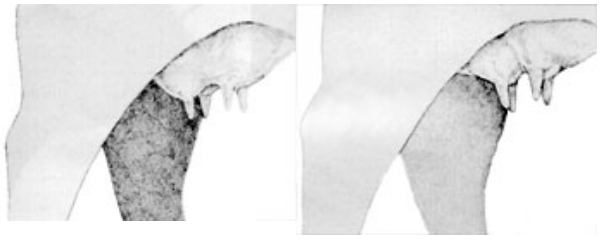
Teat Score 3: The teats are long and large in diameter; appear thicker, and not symmetrical. They may appear to be funnel shaped. The teats may appear to begin to balloon at the point of attachment to the quarter. Because the teats are long, they are usually suspended below the hock. When engorged with milk, teats will not be perpendicular to the ground. Intervention is usually required at calving. Replacement heifer retention from these dams is discouraged.

Teat Score 1: The teats are long, appear thick, and usually large and funnel/pear shaped. Teats suspend well below the hock which makes it difficult for a new-born calf to find, attach, and suckle. Intervention is required at calving. Intervention definitely required avoiding a spoiled quarter or mastitis. Replacements should not be kept from these dams and producers should cull these females from the herd.

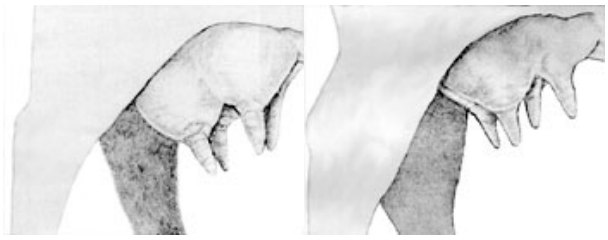
Udder suspension Teat size



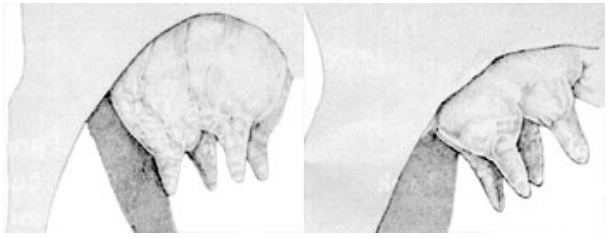
Scores : 9 9



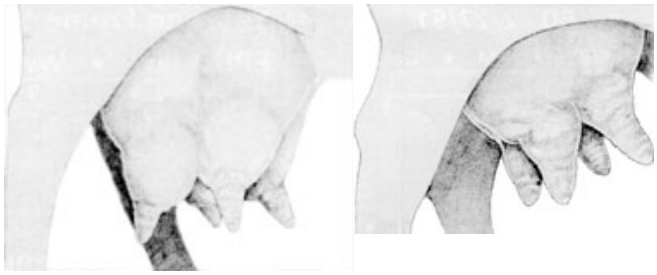
Scores: 7 7



Scores: 5 5



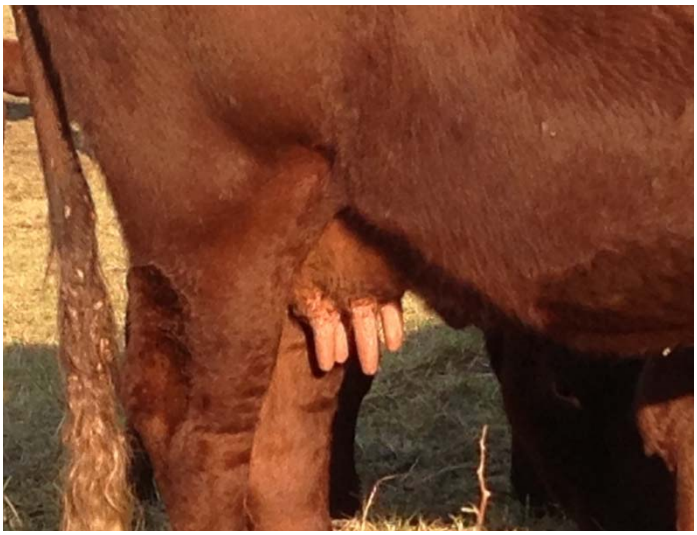
Scores 3 3



Scores 1 1

When scoring an udder, two numbers are assigned: the first digit will be the udder suspension (attachment) score, and the second digit will be teat size. For example, if a cow has an attachment score of 7 and a teat size of 5, the breeder will record 75 in the “dam udder score” column.

The cow on page 1 of this article would be given a score of 87. The udder pictured to the right would have a score of 75.



Hopefully, this gives a better understanding of the anatomy of a cows’ udder as well as a better understanding of what a good udder looks like. Before I wrap this up, let’s talk about common sense and how it relates to udder evaluation.

- Cows that are fat but raise under sized calves have poor producing udders.
- Bulls born to cows with bad udders will most likely produce daughters with bad udders.
- Research shows udder and teat characteristics are heritable; thus, change can be made through selection.
- Hairy, misshapen, or lopsided udders are problematic.
- Heavy milking cows require more nutrition and will fall apart in environments that cannot support them.

- Docile cows that let multiple calves nurse them will have problems with raising their own calves.
- Cows with empty quarters, or misshapen teats will produce less milk and wean lighter calves but will they pass that on to calves.
- Cows with extra teats are genetically defective and should not be kepts.
- Cows that are obese will deposit fat in their udders and will not produce milk to their genetic potential, even after they lose weight.
- The best way to tell if a cow is a good milker is to look at her calf.
- Looking at a cows' udder when she is dry vs. in milk is the best way to assess capacity.

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Let's take a test.

Earlier in this publication we provided you with an educational piece on udders. Without looking back score the udders on the below cattle, then refer back to the article and score the udders a second time. The answers are on the last page of this article (as I see them anyway). Remember, score the udder, not the cow, her age, or her calf…

Animal 1: Score 1: Score 2:

Animal 2: Score 1: Score 2:

Animal 3: Score 1 : Score 2:

Animal 4: Score 1: Score 2:

Animal 5: Score 1: Score 2:

Animal 6: Score 1: Score 2:

Animal 7: Score 1: Score 2:

Animal 8: Score 1: Score 2:

Earlier, you learned about udder scoring. Then, we gave you a test. Here is how I scored the udder and a few other observations I would make during cattle judging and/or evaluation. Remember that udder scoring is just that, scoring of suspension and teat size. It doesn't have adjustments for lack of balance, age, extra teats, past mastitis, etc…. Judge the udder, but remember to look at the whole picture when evaluating cattle.

Animal 1. I would score this animal a 57. She has poor suspension especially in the rear, but her teat size is fine. She is a five year old cow and her udder should not be this broken down yet. There are many things about this cow that I like but the huge fat deposits around her tail and her semi-broken down udder are not among them.

Animal 2.I will score this udder a 87. I will take udders like this all day. What I am saying is that I don't really want 99's. I would call an 88 a perfect udder for me. She has small teats, good suspension, and moderate volume of milk. This animal doesn't have the fat deposits of animal one which are indicative of a cow that has had problems before. A great cow with a great udder and what looks like a solid calf behind her.

Animal 3. I will score this animal a 98. She has no udder suspension and at 4 years of age she should maybe have a little more. She has nice teat size and scores better than any other cow on this test. I would, however take animal two or one before her, despite their lower udder scores.

Animal 4. I will score this udder a 87. Yes the same animal number two. Her teats are a little narrower but also a little longer than two. She is a different type of animal than two but one I like equally as much. They share udder scores and animal two has more capacity and muscle, but animal four is more feminine and finer boned. I will take as many of both these cows as I can get.

Animal 5. I will score this udder a 65. She has large front teats and her suspension has broken down. She is a 14 year old cow so I forgive her for the udder suspension and teat issues but what really concerns me is the excessive hair on her udder. I would expect her to raise a mediocre calf but knowing her history I would be wrong.

Animal 6. I would score this udder a 77. This is a good score and this animal has good suspension and nice teat size. What concerns me is that the udder is unbalanced. It is higher in the front than the back. I question the volume of milk in the front quarters. What a great looking cow with volume, muscle, femininity and more. She is 12 when pictured and in fairness towards the end of her lactation cycle(we should evaluate just after freshening)

Animal 7. I would score this udder a 86. She has great suspension but her teats are a little large. I have no problem with that as she is 10 at the time of the photograph. She is a great looking cow with a good udder. I would like to see her calves before purchasing her but have faith that they are probably quite nice.

Animal 8. I would score this udder a 45. The photograph is poor so accurate scoring is difficult. She has poor suspension and thick teats. She is also unbalance in between her front and rear quarters. This cow clearly has some age to her but also has clearly been poor in her udder for more than one season. I wouldn't want sons or daughters out of this girl.

How did you do? What's important is consistency. When evaluating cattle there are some measurements that are interpretive like udder score, masculinity, femininity, and quality of production and others that are not like weights, hip heights, scrotal circumferences, amount of production, etc… When doing interpretive evaluation always remember to compare animals to their peers and contemporaries. Two calves separated by 100 lbs. at weaning means little if they are on different farms under different management, but it means a lot if they are in the same contemporary group. Udder scores are valuable when assessing the quality of an animal but even more valuable when evaluating the production of a sire or a family line. Remember that when looking at a cow with a bad quarter we must ask ourselves whether her condition is genetic or a result of her experiences (mastitis, frost bite, injury). I hope this was helpful and doesn't simply go in one ear and out the udder.