The University of Georgia

College of Agricultural and Environmental Sciences
Cooperative Extension

Animal & Dairy Science Department
Rhodes Center for Animal & Dairy Science

Telephone (706) 542-2581
Fax (706) 542-9316

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Ronnie Silcox,
Extension Animal Scientist

Bit Selection for Horses

Kylee Jo Duberstein
Extension Horse Specialist

In order to select an appropriate bit, it is important to understand the principles of how a bit functions and what pressure points on the horse may be affected. The points on the horse's head that can be affected by a bit or some type of headgear include the tongue, bars, cheeks, lips, palate, nose, curb area, and poll. The two basic types of bits that can be used are snaffle bits and leverage (curb) bits. These differ in the areas on the horse where each applies pressure. Snaffle bits are considered direct pull bits because when the rider pulls on the reins, that pressure is transmitted directly to the horse's mouth. A snaffle may have a solid mouthpiece, a two-piece mouthpiece, a three-piece mouthpiece or multiple links such as a chain. The mouthpiece may or may not have a port. The key to identifying a snaffle is that it operates off of direct pull; the reins on a snaffle bit attach directly to the mouthpiece, not to a shank. A curb bit, on the other hand, involves leverage, which means the reins are attached to a shank of some design. A curb strap of some type is used under the chin of the horse. When the rider pulls back on the reins, pressure is applied not only to the horse's mouth and chin but also to the horse's poll; this is the leverage effect. It requires that the reins not attach directly to the mouthpiece, but instead to some type of shank on the bit. As the rider pulls back on the reins, the top part of the shank moves forward as far as the curb strap will allow. This creates the leverage. Poll pressure can be a very effective tool in eliciting certain responses from the horse. Horses are naturally inclined to move away from poll pressure and therefore will often lower their heads and flex at the poll to escape this pressure. This is a desired response used to achieve greater performance in many disciplines. However, to perform correctly in a curb bit, the horse must have already learned how to be guided willingly by and submit to bit pressure.

The first consideration in selecting either a snaffle or curb bit is to be sure that it is the proper width to fit the horse. Bit width is the distance between the two cheek pieces of the bit. Standard bits are 5" wide and are the most common. Pony bits are generally 4.5" wide, and bits that are designed for Arabians and other light boned, refined horses are 4.75" wide. For horses with wider mouths, bits are available in widths of 5.5", 6", and even wider for some draft horses.

Bits are often composed of some type of metal, although bits made of other materials can also be found. A popular metal used in the manufacturing of bits today is stainless steel. It does not rust and therefore is often more appealing to consumers for show purposes and everyday use. However, a rust covered bit does not necessarily indicate decreased quality. Sweet iron is a metal often used by bit makers when designing quality bits. Sweet iron rusts very easily and therefore does not maintain a shiny appearance for long but is very palatable to horses and thus is often a popular choice among experienced horsemen. Sometimes bits are composed of a sweet iron mouth piece with stainless steel cheek pieces. This allows the bit to maintain its new looking appearance outside the horse's mouth while the part that is in the mouth is made of the more palatable metal. Copper is another metal that is often included in bit making because it causes the horse to salivate. Most bits are not made entirely of copper but

will have some type of copper roller or inlay. Another metal that is sometimes seen in bit making is aluminum. Aluminum is not a particularly desirable metal for bit construction due to its light weight and unpalatable taste. The lightness of these bits causes them to "bounce" in the horse's mouth as well as causing the horse to have a diminished response to rein cues. Other materials that might be seen in bit construction are plastic ("happy mouth" bits) and rubber. Both of these materials are designed to be "soft" bits and lessen the harshness of rein cues. These can be effective on some horses but should be used with care. Often these bits are too mild and teach horses to pull against pressure rather than yield to it. In addition, the large diameter of rubber bits is often very troublesome for horses since these are typically used on young horses whose mouths are not big enough to carry them comfortably. Additionally, the use of rubber often promotes the habit of chewing on the bit.

How well a horse responds to a certain type of mouth piece is dependent on each horse's mouth conformation and preference. The more broken (jointed) the bit is, the more it will conform to the horse's mouth. A bit that is broken in several places will form around the tongue more than a bit that is solid or only broken in one place. A bit that is solid will place more pressure on the center of the tongue while one that is broken in one place will break in the middle when the reins are pulled and take pressure off of the center of the tongue, thereby placing it more on the bars of the mouth. A bit that is broken in multiple places will form around the tongue and place pressure more equally over the tongue and bars. Some horses with shallow palates are more comfortable with bits that form around their tongue; bits broken in only one place might come into contact with their palate as the rider pulls back on the reins and the bit closes at the break. Each horse responds differently to different types of bit pressure and the rider must experiment to determine which bit a particular horse performs better in.

When using a snaffle bit, the main factors that affect the severity of the bit are diameter and texture. A larger diameter of the bit means that the pressure applied to the tongue and bars is diffused over a larger surface area thereby making them less severe than a bit with a thin diameter which concentrates the pressure into a smaller area. In addition, bits can be either smooth or textured in some fashion. A common texturing technique is to make a bit with twists in the mouth piece. The thinner and sharper the twist, the more severe the mouth piece is since pressure again will be concentrated in those areas. When using a curb bit the length of shank is also a determinant of bit severity. The average shank length is 6-7", but may vary from approximately 4" to 8+". A longer shank produces more leverage than a shorter shank. The longer the shank is below the mouthpiece in comparison to the length of shank above the mouthpiece, the more leverage the bit will have. However, it is important to recognize that regardless of the bit selected, the rider's hands are the most important factor influencing the effectiveness and severity of a bit. Correct use of hands is critical in determining both the severity and performance of a bit.

Management Keys to Breeding Success

Carole Hicks Brannen
Extension Animal Scientist – Beef Cattle

Many cattle producers have already begun their calving seasons and it's hard to believe that it's time again to start thinking about breeding those cows back. However, 60 to 90 days prior to the breeding season is a critical time to focus on herd health and cow nutrition strategies that can boost cowherd reproduction. It is important to pay particularly close attention to replacement heifers.

It is extremely important to the cowherd's reproductive efficiency to evaluate their nutritional status. One good tool to utilize is body condition scoring (BCS). BCS is an excellent indication of whether cows are receiving proper nutrition to begin cycling and are ready to be bred. Proper body condition helps females maintain their health during pregnancy and better manage stresses associated with calving and lactation.

First calf heifers should be bred 30 to 45 days ahead of breeding mature cows. At this time heifers should be at a BCS of 6 and cows should be at a 5. It is important that heifers have reached at least 65% of their mature weight before breeding. One way to get this figure is to utilize the formula below:

Estimated mature weight = (Frame Score x 75) + 800

Weight at Breeding = Estimated mature weight x .65

Frame score is computed by referencing the animal's hip height to their age using the table below.

Hip Height (inches) and Frame Scores for 5 – 21 Month-Old Heifers

Age	Frame Score								
(months)	1	2	3	4	5	6	7	8	9
5	33.1	35.1	37.2	39.3	41.3	43.4	45.5	47.5	49.6
6	34.1	36.2	38.2	40.3	42.3	44.4	46.5	48.5	50.6
7	35.1	37.1	39.2	41.2	43.3	45.3	47.4	49.4	51.5
8	36.0	38.0	40.1	42.1	44.1	46.2	48.2	50.2	52.3
9	36.8	38.9	40.9	42.9	44.9	47.0	49.0	51.0	53.0
10	37.6	39.6	41.6	43.7	45.7	47.7	49.7	51.7	53.8
11	38.3	40.3	42.3	44.3	46.4	48.4	50.4	52.4	54.4
12	39.0	41.0	43.0	45.0	47.0	49.0	51.0	53.0	55.0
13	39.6	41.6	43.6	45.5	47.5	49.5	51.5	53.5	55.5
14	40.1	42.1	44.1	46.1	48.0	50.0	52.0	54.0	56.0
15	40.6	42.6	44.5	46.5	48.5	50.5	52.4	54.4	56.4
16	41.0	43.0	44.9	46.9	48.9	50.8	52.8	54.8	56.7
17	41.4	43.3	45.3	47.2	49.2	51.1	53.1	55.1	57.0
18	41.7	43.6	45.6	47.5	49.5	51.4	53.4	55.3	57.3
19	41.9	43.9	45.8	47.7	49.7	51.6	53.6	55.5	57.4
20	42.1	44.1	46.0	47.9	49.8	51.8	53.7	55.6	57.6
21	42.3	44.2	46.1	48.0	50.0	51.9	53.8	55.7	57.7

Frame Score = -11.7086 + (0.4723 x Ht) – (0.0239 x Age) + (0.0000146 x Age^2) + (0.0000759 x Ht x Age), where Age = days of age and Ht = hip height.

Another important factor to a successful breeding season is a good overall herd health program. This program should include controlling internal and external parasites and preventing diseases that could affect cow body condition and cause reproductive losses that could be detrimental to the breeding program. Females should be vaccinated 30 to 60 days prior to breeding for a variety of diseases, including bovine viral diarrhea virus (BVD). infectious bovine rhinotraecheitis (IBR), vibryosis, and leptospirosis. Producers should consult with a veterinarian to develop a herd health plan that fits their specific environment and individual operation.

If good management practices are followed, the breeding season will go much smoother and be more successful. Cows and heifers in good body condition and overall health will be more likely to breed successfully allowing for a greater percentage calf crop and therefore more profit for the producer.

Using Distillers Grains in Beef Cattle Operations

Lawton Stewart
Extension Animal Scientist

Anyone feeding cattle knows this past year has been a tough one. Drought and a volatile feed market have forced cattle producers to be creative to keep their herd fed at a reasonable cost. Byproducts have always been an option and should be considered now. As the name implies, byproducts are not the primary product of the process they come from and therefore are usually considered waste. This allows the livestock industry to use them at a competitive price. One of the major challenges with utilizing byproducts is availability due to the location of their production. Here in Georgia, a new ethanol plant in Camilla (First United Ethanol, LLC) will make one of these byproducts more available. The major byproduct from the production of ethanol from corn is distillers grains. Over the past month I have had many calls asking about rations with distillers grains, so I thought this would be an excellent opportunity to discuss distillers grains and utilizing it in beef cattle operations.

What are distillers grains? Distillers grains are the residue after the starch fraction of corn is fermented to produce ethanol and carbon dioxide. After fermentation and distillation, the remaining residue is centrifuged to produce wet distillers grains (WDG) and thin stillage. Typically, the thin stillage is condensed to produce distillers solubles and combined with the WDG to produces wet distillers grain with solubles. The WDG is dried to produce dried distillers grains with soluble (DDGS). Production of ethanol removes the starch fraction of corn leaving protein, digestible fiber, and fat. Therefore, distillers grains can serve as an excellent source of protein, with approximately 70% being undegradable in the rumen, and energy, due to the highly digestible fiber.

How are distillers' grains fed? Distillers grains are usually available with the solubles and in three forms of varying moisture content: wet (30% DM), modified wet (50% DM), and dried (90% DM). Wet and modified distillers grains are cheaper per ton compared to dried because the ethanol plant does not have to dry the grains, however there are two major considerations when determining what form to use. The wetter grains may appear to be a more attractive purchase, but the moisture may actually inflate the price/ton of dry matter material and the cost of shipping. As you can see in Table 1, WDG may not be the economical choice. Wet distillers grains are usually only economical to feed within a short radius of the plant. Handling wet distillers grains may also be an issue due to spoilage.

How much distillers grains can I feed? Distillers grains is a very attractive feed because it's an excellent source of protein and 'rumen friendly' energy, but there are limitations to its use. Several studies have shown increases in performance when fed at 15-20% of the diet's dry matter, however research from Kansas and Iowa indicate distillers grains fed at or above 40% of the diet dry matter reduces performance and/or carcass quality. Feeding guidelines are presented in Table 2. Minerals are also a limitation when feeding distillers grains. Distillers grains are low in calcium, but high in phosphorus and sulfur. In most diets, phosphorus will need to be removed from mineral mixes and calcium added to maintain a Ca to P ratio of 1.2:1 or greater. Urinary calculi (water belly) may become an issue if the diet contains excessive phosphorus, especially in steers. Excessive sulfur can lead to polioencephalomalacia (brainers), and must also

be monitored. Generally 33% of the diet is the maximum to avoid mineral influenced health problems. Before altering any mineral mix, review the mineral content of all feeds to be offered.

What is the value of distillers grains? As with any potential feed source, the value of distillers grain must be considered. Since distillers grains can serve as both an energy feed and protein feed, it is important to compare them to feeds commonly used for these purposes. Corn and soybean meal are the standard comparison for energy and protein, and corn gluten feed is similar byproduct feed providing both energy and protein. As you can see in Table 3, generally distillers grains can be a valuable source of both energy and protein compared to common feedstuffs. However, it would not be uncommon for other feedstuffs to be competitively priced compared to distillers grain.

Distillers grains have the potential of an excellent, economical supplement in beef cattle diets. The new ethanol plant is estimated to produce 328,000 tons of distillers grains per year. This availability will make distillers grains an excellent source of nutrients for Georgia producers if it is utilized properly. For more information, or assistance formulating a ration with distillers grains, contact your local county extension office.

Table 1. Cost comparison of wet and dry distillers grains based on $6/ton shipping cost.

	$/ton	Dry Matter	Feed Price $/ton DM	Shipping $/ton DM	Total Cost $/ton
Wet DDG	$50	30%	167	20	$220
Dry DDG	$130	90%	145	7	$152

Table 2. Maximum inclusion rates of distillers grains for different classes of cattle.

Cattle Type	Wt range, lb	WDGS[a]	MDGS[a]	DDGS[a]
Growing cattle	500-700	10-12	5.5-7	3-3.5
	700-900	13-15	8-9	4.5-5
Mature cows	1200-1500	16-20	9.5-12	5-7

[a]Wet distillers grains with solubles (WDGS), Modified distillers grains with solubles (MDGS), dried distillers grains with solubles (DDGS).

Table 3. Relative values of distillers grain to corn, corn gluten feed (CFG), and soybean meal (SBM).

Corn price	CGF price	Value as a energy supplement, $/Ton		SBM price	CGF price	Value as a protein supplement, $/Ton	
$/Ton	**$/Ton**	**DDGS[a]**	**WDGS[a]**	**$/Ton**	**$/Ton**	**DDGS[a]**	**WDGS[a]**
120	**109**	116	45	**260**	**134**	156	61
140	**127**	135	53	**280**	**144**	168	65
160	**145**	155	60	**300**	**154**	180	70
180	**164**	174	68	**320**	**165**	192	75
200	**182**	193	75	**340**	**175**	204	79
220	**200**	213	83	**360**	**185**	216	84
240	**218**	232	90	**380**	**195**	228	89
260	**236**	251	98	**400**	**206**	240	93

[a]Calculated using Corn – 90% DM, 88% TDN; CGF – 90% DM, 80% TDN, 24 % CP; DDGS – 90% DM, 85% TDN, 28% CP; WDGS – 35% DM, 85% TDN, 28% CP; SBM – 90% DM, 50% CP.

Performance Tested Bull Sale

Ted G. Dyer
Extension Animal Scientist – Beef Cattle

The 39th Annual Calhoun Bull Evaluation Center Bull Sale will be held – Friday, December 5, 2008. The sale will be held at the Northwest Georgia Research and Education Center Livestock Pavilion in Calhoun, Georgia. The sale starts at 12:30 pm. Approximately 85 performance tested bulls will sale. Eight breeds will be represented. These include: Angus, Red Angus, Charolais, Gelbvieh, Gelbvieh Balancer, Hereford, Simangus, and Simmental.

The bulls in this sale have been tested for 112 days to evaluate their potential for growth. Only the bulls which rank in approximately the top two-thirds of each breed are allowed to sell (based on ADG-average daily gain and WDA-weight per day of age). These bulls have also passed a breeding soundness exam and are guaranteed as breeders. All known disposition and soundness problems have also been eliminated from the sale.

In addition to performance records, additional information includes Expected Progeny Differences (EPDs) and ultrasound measurements for backfat, ribeye area and percent fat in ribeye area (intramuscular fat).

Each of the bulls offered in the sale will have sound data to back up his performance. You are able to select bulls that best fit your beef herd – by comparing (EPDs). The EPDs tell us how the average calf crop, sired by a certain bull will perform. For example – A bull with a weaning EPD of 40 pounds should sire calves that average 40 pounds more at weaning than a bull with a weaning EPD of 0. The same is true for birth and yearling weights. The milk EPD refers to the added weaning weight of a bull's daughter's calves due to her increased milk production. Of course, there are also negative values for each trait as well.

The EPDs have been more accurate in predicting how a bull's progeny will perform than the bull's own performance. The most current information will be provided in order for you to make a sound decision when selecting your next herd sire.

The bulls are available for viewing at the Bull Evaluation Center located just off GA. Hwy. 140 on Bells Ferry Road in Floyd County prior to the sale and will be on display at the Livestock Pavilion in Calhoun from Wednesday, December 3rd pm until sale time on Friday, December 5, 2008. If you need additional information on the sale visit www.tifton.uga.edu/pc-web or contact me at (706) 624-1403. Sale catalogs should be available just before the Thanksgiving holidays – contact your local extension agent for a copy or view the catalog on-line. Hope you can put this sale date on your calendar.

Curly Calf Syndrome

Ronnie Silcox,
Extension Animal Scientist

"Curly Calf Syndrome" is a genetic defect that has raised some concern in the Angus breed recently. "Curly Calf" is the common name for Arthrogryposis Multiplex (AM). Affected calves are born dead with a bent or twisted spine and legs are often straight and rigid. The name "Curly Calf Syndrome" comes from this twisted appearance of the calf.

All indications are that "curly calf" is caused a by a recessive gene. For a calf to be affected, both parents must be carriers of the recessive gene. A carrier will be normal in appearance.

If A = Normal allele and a = recessive curly calve allele (alleles are alternate forms of the same gene);

A cow or bull with the following genotypes will be:

AA =Normal
Aa = Carrier (normal in appearance)
aa = Curly Calf

To get a calf with "Curly Calf Syndrome" you must breed a carrier bull (Aa) to a carrier cow (Aa).

Half of the sperm cells produced by a carrier Bull (Aa) will have the normal allele (A) and half will have the curly calf allele (a). Half of the eggs produced by carrier cows would have the normal allele (A) and half would have the curly calf allele (a). When you mate carriers the probabilities are:

25% - AA = Normal
50% - Aa = Carrier with normal appearance
25% - aa = Curly calf syndrome

If a calf is born with "Curly Calf Syndrome", both the sire and the dam must be carriers of the defective gene (a).

More information about this condition can be found at the American Angus Association webpage: http://www.angus.org/ccs_info.html