



Welcome to the first issue of Beef Cattle Penning! This quarterly beef production newsletter is published by Texas AgriLife Extension Beef and Livestock Specialists and will serve as a source of timely beef cattle information for Texas producers. Specialists will contribute articles discussing production practices that beef producers can directly utilize in their operations. This issue will discuss Hay Quality and Cow Nutrition, Determining Pregnancy in Beef Cattle, Expected Progeny Differences and the 54<sup>th</sup> Texas A&M Beef Cattle Short Course.

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## Hay Quality & Cow Nutrition For the Winter of 2007-08



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Winter supplementation and hay production are significant production costs for beef producers across the Southern US. Beef producers with an eye on profitability must pay close attention to cow body condition score and winter supplementation expenses. Research shows that mature cows must be in a condition score of at least 5 *at calving* in order to maximize their opportunity to deliver a strong calf and rebreed within 90 days post-calving.

Forage quality (whether rooted in the pasture or offered in a bale) has a major influence on the type and amount of supplement required to meet a cow's daily nutrient requirements. Dry soil conditions this fall robbed many areas of the traditional early fall growth response by warm-season perennial forages. Consequently, forage quantity and quality is lower than 'normal' for early winter in many areas.

Though hay is readily available across the state, quality varies appreciably. Hay quality (nutrient content and digestibility) is most often guessed at or speculated upon. Though physical appearance and production history (soil moisture conditions, fertilization, stage of maturity at harvest, etc.) provide some indication of quality, there is

no substitute for laboratory analysis of hay samples.

Consider the results from the 2007 Wilson County hay show shown in Table 1. A total of 31 Bermuda grass and 14 warm season annual grass (Sudan grass) samples were entered in the show. Notice the range in protein content observed in these hay samples.

### Puchasing Hay

Too often, the only question asked when inquiring about hay is, "How much per bale?". When the purchasing decision is based solely on cost per bale and its physical appearance (color, stem size, presence of seed heads, smell, etc.), there is little incentive for the hay producer to know bale weights or pursue a nutrient analysis of the hay.

Cattle are traded by the pound or head, feed by the sack, hundredweight or ton, and fuel by the gallon. *Why then, is it still common practice to trade hay by a bale of unknown weight?*

The relationship between bale weight, cost per bale and cost per ton of hay is shown in Table 2.

**Table 1. Wilson County Hay Show Results, 2007**

	Crude Protein, %	Acid Detergent Fiber, %
Bermudagrass (n=31)		
Average	9.2	41.2
Range	4.7-19.3	32.2-47.7
<i>Best Quality*</i>	19.3	32.2
<i>Least Quality*</i>	4.8	47.7
Warm Season Annual Grass (n=14)		
Average	8.8	45.7
Range	4.3-17.3	35.3-55.6
<i>Best Quality*</i>	17.3	51.3
<i>Least Quality*</i>	4.3	44.5

\*as determined for dry cows with FORAGVAL (<http://forage.tamu.edu/forage/default.asp>)

**Table 2. Relationship between bale weight and cost per ton.**

Bale Weight, lb.	Cost per Bale							
	\$30	\$40	\$50	\$60	\$70	\$80	\$90	\$100
	Cost per ton of hay, \$							
900	67	89	111	113	156	178	200	222
1000	60	80	100	120	140	160	180	200
1100	55	73	91	109	127	145	164	182
1200	50	67	83	100	117	133	150	167
1300	46	62	77	92	108	123	138	154

### Protein Supplementation

As previously mentioned, a significant portion of the hay harvested across Texas in 2007 was mature when cut, may have laid in the field for an extended time after cutting and/or may have been rained on prior to baling. The net result – hay with a relatively low protein content.

A beef cow needs a minimum of 7% crude protein in her total diet. At levels below 7% CP, growth of the rumen bacteria population suffers and forage digestibility is hampered. As digestibility declines, forage intake must follow. And as intake declines, so goes performance (weight maintenance or gain, milk production, ...).

Protein supplementation of low quality forages yields an economically efficient production response. When dietary

CP is less than 7%, the primary need of the rumen bacteria is degradable intake protein (DIP). Feeds such as cottonseed meal, soybean meal, and corn gluten feed are just a few options for supplying a natural source of DIP. Supplemental protein facilitates greater intake of low quality forage. With increased forage intake comes increased energy intake and improved animal performance.

For more information on beef cattle supplementation, see Texas Cooperative Extension Publication B-6067, *Supplementation Strategies for Beef Cattle* which can be found at <http://beef.tamu.edu/>.

## Determining Pregnancy in Beef Cattle



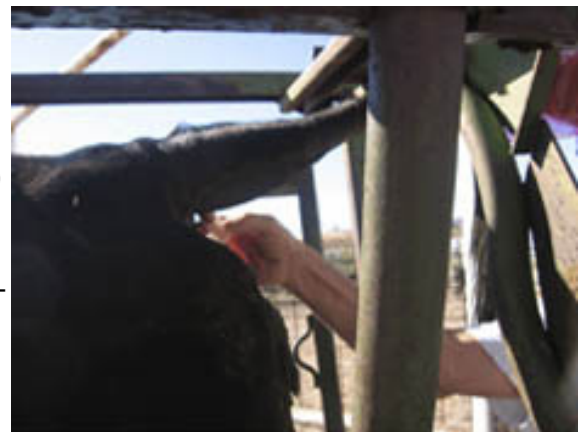
*Bruce B. Carpenter*  
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The economic value of annual pregnancy testing and culling of open and sub fertile cows and heifers has been well documented: with positive affects on herd fertility, weaning weight per cow, and income per cow. In addition, the identification and removal of open females allows supplemental feed and pasture costs to be better controlled. Knowing expected calving dates can be an advantage when marketing bred replacement heifers. Potential buyers often want to purchase females whose calving dates coincide with those of their present herd.

**Rectal palpation** of the fetus, and/or uterine-placental structures has been a long-practiced method of determining pregnancy in cattle; and it will likely continue as a popular method. Palpation's advantages are that it is still a very quick method of determining pregnancy and it requires very little in the way of equipment. It does however require extensive training and practice, especially if performed during the very early stages of pregnancy (35-60 days). As opposed to dairymen, most beef ranchers utilize rectal palpation pregnancy checks during the fall, at weaning, when it is generally easier to detect a large fetus at 3 to 6 months-of-age. Still, with rectal palpation, errors can and do occur.

**The BioPRYN<sup>®</sup> test** is a new method to determine pregnancy. It utilizes a laboratory procedure to test tail- or jugular-bled animals for pregnancy. It is essentially a "yes/no" test and is 99 percent accurate on pregnant cows and about 95 percent accurate on open cows. Blood collections are shipped by commercial carrier to a laboratory. Results are available by fax or e-mail within 27 hours after arrival at the lab. Cost of the test is \$2.25 per sample plus purchase of blood collection equipment and shipping.

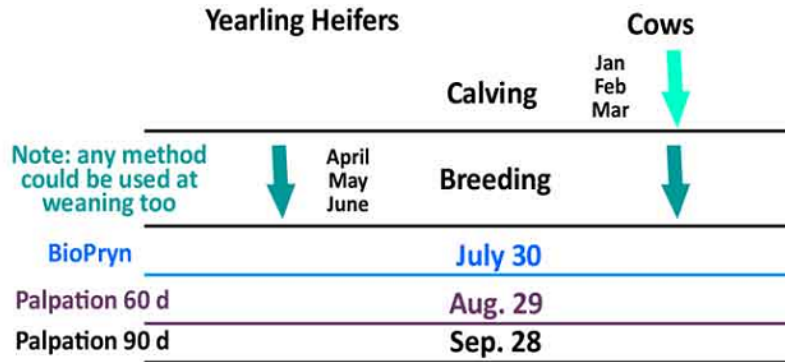
BioPRYN<sup>®</sup> stands for pregnant ruminant yes / no, as it has application in many species of domestic and wild ruminants. The test detects the presence of a protein known as 'pregnancy specific protein B' (PSPB) in the blood of the mother. PSPB can be accurately detected as early as 30 days post-conception (i.e. cows and heifers can be tested as early as 30 days after breeding). However - cows that have calved will have residual PSPB in their blood. To allow for clearance time, it is recommended not to test lactating cows until 90 days after calving - so practically speaking - a herd of multiparous beef cows managed under a controlled calving season, probably wouldn't be tested until at least 30 days after the end of the breeding season (see diagram below). With calving dates on individual cows, it could be possible to track and test individual animals at earlier times (during the breeding season). But for range cows, this scenario would be unlikely due to high labor and animal handling requirements.



Cows are reported as open or pregnant based on the optical density of blood samples as measured by calibrated

laboratory equipment. Although BioPRYN® is a yes / no test; some estimation of length of gestation can be made based on the relative magnitude of optical densities between samples. That is, animals in late gestation will have a relatively higher optical density score compared to animals that are in early gestation. Sometimes a cow will be reported as 'open-repeat' or 'pregnant-repeat'. This indicates that 1) the age of the embryo may be just less than 30 days, or 2) that it has died leaving some residual PSPB. It is recommended to bleed and re-test these animals 5 or more days to allow for either embryo growth or clearance of residual early embryonic PSPB.

### Example of BioPryn vs. Palpation (90 day breeding/calving season)

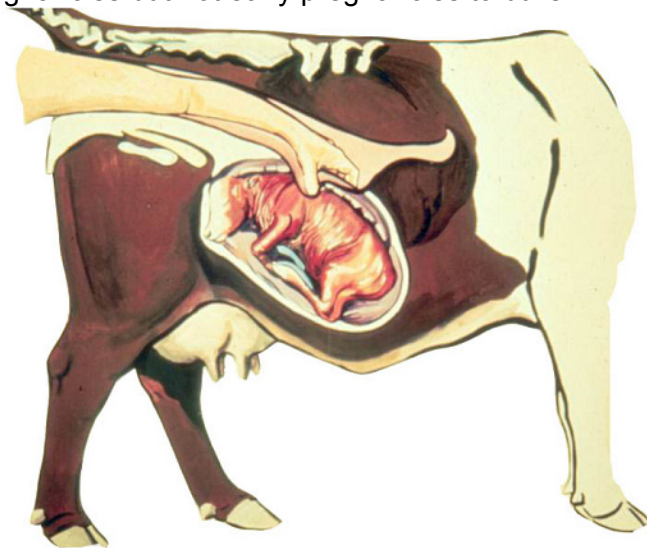


When comparing BioPRYN® to rectal palpation or ultrasound, note that the results of the BioPRYN® test are not immediately available, so any keep or cull decisions would be postponed until receipt of the lab report. In addition, cattle must be individually identified to allow for culling or other management once the results of the BioPRYN® test are known. With the other two methods, neither individual ID, nor the need to re-work cattle is required. Also, a skilled person can determine the stage of pregnancy with either rectal palpation or ultrasound. This type of information may be useful for culling and marketing decisions, or in determining if pregnancy occurred (unintentionally)

after the herd bulls were removed.

One specialized use of the BioPRYN® test is in artificial insemination programs to determine conception to estrous synchronized AI vs. clean-up bulls. To do this, clean-up bulls are not placed with the herd until 16 days after the last AI breeding. Blood testing at 30 to 35 days after AI will detect AI pregnancies but not early pregnancies to bulls. All cows or heifers classified as "open" with the first test are re-tested 30 or more days after the end of the bull breeding season. For more information contact BioTracking LLC ([www.biotracking.com](http://www.biotracking.com)).

**Ultrasound** has many uses for reproductive diagnostics in cattle, including pregnancy determination. However, using it as a method for routine pregnancy determination on animals in later stages of gestation is often not cost-effective. This is due to the high cost of ultrasound equipment and/or ultrasound service. Still, there are situations where ultrasound might be the best way to examine the uterus and/or pregnancy. These might include early pregnancy determination, fetal sexing, or determining the number and/or viability of embryo(s) / fetuse(s). Pregnancy may be detected as early as 26-28 days, but examinations will be more accurate if they are preformed after 30 days.





# EPD for Traditional Cow/Calf Producers



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Expected Progeny Difference is recognized as the best tool for making genetic change, if the trait you're interested in has EPD. EPD can be used to compare all individuals in a breed, from all years, and across all locations and management systems. All of the major breeds have EPD, but they don't have it for all of the same traits. Some breeds now report over 20 EPDs. They can be divided into growth/production, maternal, carcass/ultrasound, and indexes.

EPDs are comparative values, not absolute; they do not predict actual performance. EPDs predict how progeny of one parent would compare to those of another parent. Because of selection over time, current-breed average EPD is not zero. For example, the current average Yearling Weight EPD in Hereford is +68. To see where an individual's EPD ranks, check the breed association website for current averages, which are updated once or twice a year.

Let's assume you're a traditional producer using EPD to compare potential sires. Now, what do we mean by traditional producers, who still comprise the majority? Those who sell at weaning, or shortly after, to a buyer who prices on visual appraisal. Which EPDs should be important to such a producer? Those that directly affect that producer. That means feedlot and carcass/ultrasound traits are irrelevant to a traditional producer and can be ignored. There are two types of traditional producers.

If replacement heifers are not saved, maternal traits don't matter in selecting sires. (They do matter in obtaining replacements.) What EPDs does that leave? Birth Weight and Weaning Weight. A few associations have EPD for Direct Calving Ease, which takes into account all factors and not just birth weight. Some have Scrotal Circumference EPD. Scrotal circumference is a good indicator of sperm-producing potential. But EPD predicts genetic transmission to progeny. In buying a bull, you should be interested in the bull's own ability and the best predictor of that is his actual scrotal circumference, not his EPD.

Of course there are other important factors to consider such as structural soundness, visible characteristics affecting calf price, etc. But if heifers are not saved then that's it on EPD. This producer should be interested in the best predictors of calving ease and weaning sale weight. What EPD levels? Acceptable levels of Birth Weight or Calving Ease that fit the operation (and that depends on the cowherd) and high Weaning Weight.

If replacement heifers are saved, additional EPDs should be considered. Milk EPD predicts the maternal effect that female progeny will have on the weaning weight of their calves, separate from the genetics for growth that the female transmits. (Total Maternal EPD combines Milk and Weaning EPDs into one value.) In a few breeds, there are EPDs for additional things affecting the maternal side such as heifer pregnancy, maternal calving ease, cow weight, cow height, and "stayability" (longevity).

What levels of these EPDs should this producer be looking for? Optimum, and that varies with the production conditions. In a herd where heifers are saved, there should be a balance of calf growth potential and maternal ability. And that's rarely done by selecting for maximum Weaning Weight and Milk.

The latest thing in EPDs is value indexes. These use EPDs of multiple traits affecting some overall measure, assign economic values to those traits, and calculate a comparative dollar-value EPD. The choices of economic values can significantly impact an index. There is an index for dollar value at weaning, which includes costs and returns associated with birth weight (calving ease), weaning weight, cow weight, and milking level. Cow weight and milking level are used in an index for cow feeding cost. Those two indexes could be useful to producers who save

replacement heifers, but not to those who don't. There also are indexes for feedlot performance, carcass merit, feedlot and carcass merit combined, and total value from birth through carcass. However, as with individual traits, indexes for things beyond weaning should not matter to a traditional producer.

Which EPDs should be important to the increasing number of non-traditional producers? In short, those that directly affect their operation. But that's a subject for another time.

For more detailed information on EPD go to [http://beef.tamu.edu/academics/beef/pub/genetics/E164\\_epds.pdf](http://beef.tamu.edu/academics/beef/pub/genetics/E164_epds.pdf)

## Beef Cattle Short Course



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Each year in August more than 1,300 beef cattle producers from across the U.S. and other countries converge on the campus of Texas A&M University to attend the Beef Cattle Short Course. The Short Course, in its 53 year history, has become the largest beef producer educational event of its kind in the U.S.



The 2 ½ day educational event is known for being one of the most comprehensive beef cattle adult educational programs available. Almost 50 different university faculty and industry leaders from across Texas and the U.S. help form a very diverse and cutting edge educational program.

The most popular part of the Short Course each year is the Cattlemen's College. The Cattlemen's College is a group of workshops that are devoted to specific topics. This format allows participants to choose the specific workshops that they are interested in.

The Beef Cattle Short Course trade show is also a popular part of the conference with more than 100 different exhibitors on hand to discuss their products and services.



The following are just a few comments taken from surveys completed by the beef producers attending the 2007 Beef Cattle Short Course:

"Great programs and excellent instructors. The material presented was very up to date and easy to understand."

"Course content was excellent and applicable to implementing in the herd/farm immediately."

"After this first 'college,' I would consider it a must for next year."

Planning is well underway for this year's Beef Cattle Short Course to be held August 4-6, 2008. For more information, visit <http://animalscience.tamu.edu/ansc/BCSC/index.html>

**FOR MORE INFORMATION CONTACT:**

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