Master Cattleman Quarterly

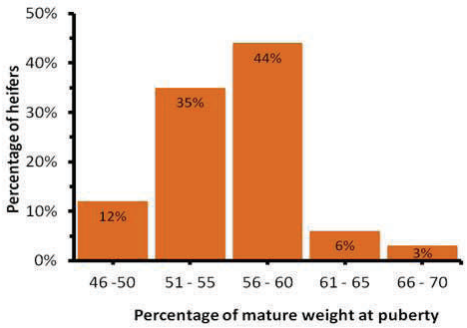
Oklahoma State University

Percentage of Mature Weight at Puberty in Heifers

Glenn Selk, OSU Extension Cattle Reproduction Specialist

For years, the accepted target weight for yearling replacement beef heifers at breeding was 65% of their mature weight. Recently that target has been questioned. OSU reproductive physiologists have studied the weight that beef heifers reach puberty in relationship to their eventual mature weight. A total of 34 crossbred heifers (in 3 different years) were studied at puberty and again when they had reached maturity at 5 to 7 years of age. The heifers were at least ¾ Angus and ¼ or less Hereford. Shrunk weights were obtained when concentrations of progesterone in the plasma indicated that cycling activity had begun. *Please remember that "average" is the point at which approximately half of the heifers reached puberty*. The "average" weights at puberty were statistically similar (695 lb, 695 lb, and 737 lb) for the three years. Mature weights were obtained in mid-gestation, adjusted to a body condition score of 5. Mature "average" body weights were also similar (1269 lb, 1256 lb, and 1280 lb) for cows born in all three years. The mean (or "average") weight at which heifers reached puberty was 56% of the mature weight.

Figure 1 shows the percentage of heifers reaching puberty at the incremental



increases in percentage of mature weight. Only 12% of the heifers reached puberty at 50% of mature weight or less. Only 47% percent of the heifers reached puberty at 55% of mature weight or less. Ninety-three (93%) percent of the heifers reached puberty at 60% of mature weight and 97% had reached puberty by the time they weighed 65% of the mature weight. Producers wanting to be certain that a high percentage (90% or more) of their replacement heifers have reached puberty before the start of the breeding season, need to have heifers weigh at least 60% of the mature weight.

Source: Davis and Wettemann. 2009 OSU Animal Science Research Report.

Rental Rate Data Sources

Damona Doye, OSU Extension Economist

OSU in cooperation with the Oklahoma Ag Statistics Service conducts a biennial crop and pasture rental rate survey for both cash and share rent and different types of crops and pasture. Those 2008-2009 results are available in OSU CR-216, Oklahoma Pasture Rental Rates and CR-230, Oklahoma Cropland Rental Rate. Both publications can be downloaded free from the OSU pods.dasnr.okstate.edu publication database. We'll be sending out a survey to gather new data this fall so if you would like to contribute and aren't on our OSU Cooperator mailing list, please contact your local Extension Educator – Ag or me (damona.doye@okstate.edu) to volunteer.

Because of Farm Bill requirements, the USDA National Ag Statistics Service

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now offers county level averages for cash rents for cropland and pasture for calendar years 2008 and 2009. You can access this survey data at:

www.nass.usda.gov

Click on Economics at the left side of the page, then select Cash rents (in the middle section) and click on Search. Select County Cash Rents Data Query. Under Select Location - Locale:, choose County. Once the online database is accessed, you can select the state. If you aren't interested in data for the entire state, you can choose an Agricultural District to focus on multiple counties in an area. Or, you can choose a county without specifying an Agricultural District. Once you have made your geographic choice, select a specific year (if you don't choose one, you can view both years). Finally, click on Get Data at the bottom of the window.

Moderate versus Big Cows: Insights from Analysis with Budgets and CowCulator

Damona Doye and David Lalman

Are the bigger cows which are increasingly common in sale barns earning their keep on the ranch? While we don't yet have much research based on University or producer herds, we've done some pencil-pushing (actually, software calculations) to begin to think about this issue. As part of Master Cattleman classes, you were exposed to two software tools, the OSU enterprise budgets (agecon.okstate.edu/budgets) and CowCulator (**http://www.beefextension.com/new%20site%202/cccalc.html**). OSU Enterprise Budgets are Excel spreadsheets for estimating production costs and returns. CowCulator assists producers in making informed decisions associated with beef cow nutrition using animal criteria (such as cow weight, body condition, stage of production and breed) with animal requirements and performance predictions based on years of research data. We used these two tools to look at what is required to maintain two different sized cows and to analyze the returns they generate.

Here, we estimate the costs and returns associated with two cow sizes that we refer to as moderate (1,100 lb. cow) and big (1,400 lb. cow) on two different pasture systems, native and improved pasture. The native pasture system is 1,000 acres of native pasture at an annual cost of $12 per acre while the improved pasture is 160 acres of fescue at an annual cost of $22 per acre plus 160 acres of bermudagrass at an annual cost of $17 per acre (you can think of the pasture cost as either the rental rate or the opportunity cost of not renting out owned land). Improved pasture requires an additional $40 per acre for fertilizer. Stocking rate was adjusted based on estimated pasture productivity and cow size to achieve approximately equal grazing pressure in each scenario or system. The amount of hay fed (Table 1) is an indication of the assumed differences in daily dry matter intake based on mature weight. In the native pasture system, hay is valued at $65/ton whereas higher quality improved pasture system hay is valued at $75/ton. In the base comparisons, we assume that herds are composed of 80% cows and 20% replacement heifers. Initially, we assume that the calving percent is 87% and calf death loss is 3% regardless of cow size or pasture system. Culled breeding stock is sold in October with cull bull prices at $61.48 per cwt and cull cow prices at $47.27/cwt, the historical average, seasonal prices for 2005-2009.

We established our base case with the number of breeding females that could be stocked on 1,000 acres of native pasture: 100 cows plus 4 bulls. The improved pasture scenario was designed to meet the 100 cow, moderate-size base case. When cows are bigger, fewer can be run on the same acreage; hence, the big cow herd is 76 breeding females and 3 bulls in both pasture systems. Budget assumptions for production parameters with differences between moderate and big cows are summarized in Table 1. Bigger cows are assumed to wean bigger calves and therefore, the calf price per pound is lower for the big cow scenarios. In fact, average weaning weight as a percent of cow weight is assumed to be 45% for both cow sizes. Therefore, it is important to note that in this base scenario, the 300 lb of additional cow weight is assumed to be equally as productive as the first 1,100 lb of cow weight. Later, we consider a scenario where the additional mature cow weight is

assumed to be less productive. Labor hours per head are based on Kansas Farm Management Association data and differ by herd size.

In the native pasture system, the stocking rate was set low enough to minimize the need for hay feeding. Even so, thirty days of prairie hay feeding was assumed for each class of cattle to account for extreme weather conditions or low forage availability in late winter. Dormant tall grass prairie (native) forage and prairie hay contain only 2 to 5% crude protein compared to a requirement in cows and heifers ranging from 8 to 11% of diet dry matter. Therefore, in this system a greater amount of supplemental protein was provided using 20% or 38% commercial range cube products. Larger cows and heifers require slightly more supplemental protein and energy compared to more moderate sized cows. Therefore, the amount of supplement for cattle of larger mature size were assigned slightly higher supplement feeding rates (Table 1).

Fescue and properly managed stockpiled, fertilized bermudagrass pasture should contain higher protein concentration during fall and late-winter/ early-spring. Accordingly, less supplemental protein should be required during these times. Thus, the supplementation period for the improved pasture system was shortened to match the hay feeding period. Even though the improved forage system should require less supplementation, the nutrient concentration of these forages decline more rapidly and to a greater extent during winter, effectively requiring a longer hay feeding period (75 d). Also notice that 38% range cubes were not used in the improved forage system due to higher protein concentration of standing forage and hay.

Table 2 summarizes the results of the budget calculations. When the calving percentages and death losses are the same, the big cows wean more pounds. So, despite the lower price per pound, the big cows generate significantly more calf income. And, though the price per pound is the same for culls from both moderate and big cow herds, because culls are larger, the big cows also generate a bit more cull female income. Clearly, if we focus only on revenue generated, the big cows have an advantage of $94.22 per cow, which seems substantial. But, there's the rest of the story….

When it comes to expenses, the tables are turned, largely because of the nutritional expenses associated with maintaining the large cow size. The nutrition subtotal shows that the big cow's nutrition costs are almost $60 per head higher on native pasture and nearly $90 per head higher in the improved pasture system. In addition, some fixed costs for machinery and equipment, fencing and labor are spread over fewer big cows so costs per head are slightly higher. There's still a portion of a pickup and trailer charged to the cow herd regardless of number of head in the herd. You may still have the same number of hours to drive to check the herd or feed whether there are 76 or 100 cows. So, when you divide the total machinery/equipment cost by number of head, you have a higher per cow cost. More expenses lead to higher operating interest charges.

To focus on the returns to the land base rather than income and expenses per head, Table 3 shows total income and expenses for the ranch. While the penalty for having bigger cows may not seem large, remember that the base case assumes that reproductive rates are the same and that calf weaning weights are the same proportion of cow body weight. In fact, preliminary data suggests that these assumptions are too kind to the big cows. Table 4 shows per cow costs and returns with what may be more accurate calving percentages and weaning weights. Clearly, if weaning weight is only 12.5 pounds more per 100 lb increase in cow body weight and the calving rate is 80 percent rather than 87 percent, the potential losses per head are large for big cows. More work is needed to determine if there should be a reproductive and/or calf weaning weight discount for the larger mature cow size.

Higher costs of production lead to higher levels of financial risk. Having bigger cows can make an operation more vulnerable in times of drought as more feed must be bought or more pasture found to maintain the cow. Do your own calculations to assess your personal situation. Do you have cow size matched to your forage base? Are you maintaining cow weights appropriately at different stages of the cow's productive cycle? Do your production and financial record-keeping systems support this kind of analysis? If you need assistance in analyzing your business, contact your local Extension educator, an area specialist or one of us.

Moderate versus Big Cows: Insights (continued)

Table 1. Key differences in production parameters for moderate versus big cows

	Moderate Cows	Big Cows
Production differences		
Cow weight	1,100	1,400
Bull weight	1,750	2,400
Replacement heifer weight	825	1,050
Replacement heifer price per cwt	94.07	88.97
Weaned heifer weight	480	615
Weaned heifer price per cwt	110.37	102.08
Weaned steer weight	510	645
Weaned steer price per cwt	115.7	109.44
Herd size: breeding females	100	76
Supplementation: Native Pasture		
Protein fed: 38% cubes		
Cows	1.5 #, 150 d	2 #, 150 d
Weaned heifers	2 #, 120 d	2.5 #, 120 d
Protein fed: 20% cubes		
Repl heifers	4 #, 60 d.	5 #, 60 d
Weaned heifers	4 #, 60 d	4 #, 60 d
Bulls	4 #, 120 d	5 #, 120 d
Hay: Prairie		
Cows	24 #, 30 d	31 #, 30 d
Repl heifers	21 #, 30 d	27 #, 30 d
Weaned heifers	13 #, 30 d	17 #, 30 d
Bulls	38 #, 30 d	50 #, 30 d
Supplementation: Improved pasture		
Protein fed: 20% cubes (# per head per day)		
Cows	1.5 #, 75 d.	2 #, 75 d
Repl heifers	1.5 #, 90 d + 4 #, 30 d.	2 #, 90 d + 5 #, 30 d.
Weaned heifers	2 #, 120 d	2 #, 120 d
Bulls	4 #, 45 d	4 #, 45 d
Hay: bermudagrass (# per head per day)		
Cows	24 #, 75 d	31 #, 75 d
Repl heifers	21 #, 75 d	27 #, 75 d
Weaned heifers	13 #, 75 d	17 #, 75 d
Bulls	38 #, 75 d	50 #, 75 d
Minerals	.12 lb/head/day	.16 lb/head /day
Labor	8 hours/head	11 hours/head

Table 2. Budget results ($ per breeding female)

	Native Pasture		Improved Pasture	
	Moderate Cows	Big Cows	Moderate Cows	Big Cows
Income items				
Calf income	313.59	372.76	313.59	372.76
Cull cow income	103.99	130.61	103.99	130.61
Cull replacement heifer income	77.61	86.04	77.61	86.04
Gross income	**495.19**	**589.41**	**495.19**	**589.41**
Expense items				
Pasture	120.00	157.89	190.40	250.53
Hay	27.73	34.65	79.99	99.95
Protein	59.60	68.80	26.21	28.8
Minerals	17.08	22.59	17.08	22.59
Nutrition subtotal	**224.41**	**283.93**	**313.68**	**401.87**
Vet	9.24	10.55	9.24	10.55
Marketing	7.68	7.61	7.68	7.61
Fuel, lube repairs	24.09	31.69	24.09	31.69
Labor	56.5	75.90	56.5	75.90
Operating interest	15.38	19.63	20.07	25.82
Total operating costs	337.30	429.31	431.26	553.44
Returns above op. costs	**157.89**	**160.10**	**63.93**	**35.97**
Fixed costs	143.99	148.09	143.99	148.09
Total costs	481.29	577.40	575.25	701.53
Returns above all costs	**13.90**	**12.01**	**-80.06**	**-112.12**

Table 3. Ranch returns to different cow size and pasture systems ($)

	Native Pasture		Improved Pasture	
	Moderate Cows	Big Cows	Moderate Cows	Big Cows
Gross income	49,519	44,796	49,519	44,796
Total operating cost	33,730	32,628	43,126	42,062
Returns above operating cost	15,789	12,168	6,393	2,734
Fixed costs	14,399	11,255	14,399	11,255
Total costs	48,129	43,833	57,525	53,316
Returns above all costs	**1,390**	**913**	**(8,006)**	**(8,521)**

Moderate versus Big Cows: Insights (continued)

Table 4. Returns to big cows on native pasture with different assumptions on calving rate and weaning weight ($ per breeding female)

Budget summary: big cows, native pasture ($/cow)	Base case	80% calving rate	Weaning weight at 12.5# more per 100 lb. increase in cow weight	Weaning weight at 12.5# more per 100 lb. increase in cow weight & 80% calving
Gross income	589.41	544.13	547.51	513.13
Total operating cost	429.31			
Returns above operating cost	160.10	114.82	118.2	89.77
Fixed costs	148.09			
Total costs	577.40			
Returns above all costs	**12.01**	**-33.27**	**-29.89**	**-58.32**

Oklahoma Cattle Processing Field Days

Jeff Jaronek, Oklahoma Beef Council

The Oklahoma Beef Council is taking the Oklahoma Beef Quality Assurance education to producers through four cattle processing field days across the state this fall. During the field days, producers will be able to attend the educational program to become a BQA certified producer, learn proper cattle handling and processing procedures through live demonstrations and cover management that pertains to your operation. Attendees will be provided lunch and have the opportunity to win a Priefert chute and carriage that will be used during the demonstrations. This has been made possible through the cooperation of Priefert Ranch Equipment and Shawnee Feeds.

One field day will take place in each of the four districts at a centralized location. Focus will be on BQA certification and cattle production within each district. Stocker and cow-calf operators will be the targeted audiences, but emphasis on each will be altered according to each district. Locations and dates for the field days are:

- **Northeast District:** Tulsa Co. Fairgrounds – Aug. 24th
- **Southwest District:** Caddo Co. Fairgrounds – Sept. 8th
- **Northwest District:** Woodward Co. Fairgrounds – Sept. 13th
- **Northeast District:** Pittsburg Co. Expo Center – Sept. 15th

The schedule for all four field days is:

- 8:30 am-9:00 am – Registration
- 9:00 am-12:00 pm – BQA & Demo
- 12:00 pm-12:45 pm – Lunch Provided
- 12:45 pm-1:30 pm – BQA Recap
- 1:30 pm-2:00 pm – Certification Test

You must take the BQA certification test to be entered to win the chute.

If you are already BQA certified, feel free to attend and you can still be entered to win.

For questions or to RSVP contact Jeff Jaronek at (405) 840-3777 or jeff.jaronek@oklabeef.org.

If you are unable to attend the field day in your district, a traditional BQA meeting will be offered that evening at a different location within your district. For times and locations, contact the Oklahoma Beef Council at (405) 840-3777 or visit their website at www.oklabeef.org.

Scheduled 2010 OQBN Vac-45 Sales

Doug McKinney, OSU Animal Science Department

Location	Contact	Phone Number	Sale Date	Wean Date
Durant Livestock	Ronald Jordan	580-924-1850	Sept. 9, 2010	July 26, 2010
OKC West	Bill Barnhart	800-778-9378	Nov. 3, 2010	Sept. 19, 2010
McAlester Stockyards	Lindsey Grant	918-423-2834	Nov. 9, 2010	Sept. 25, 2010
Durant Livestock	Ronald Jordan	580-924-1850	Nov. 11, 2010	Sept. 27, 2010
OKC West	Bill Barnhart	800-778-9378	Dec. 1, 2010	Oct. 17, 2010
Stillwell Livestock	Danny Isaacs	918-696-2605	Dec. 3, 2010	Oct. 19, 2010
Durant Livestock	Ronald Jordan	580-924-1850	Jan. 6, 2011	Nov. 22, 2010
Blackwell Livestock	Gary or Grady Potter	580-363-9941		
Tulsa Stockyards	Joe Don Eaves	918-760-1300		

For additional information about Oklahoma Quality Beef Network, contact your local OSU Extension Office.

Retain Ownership Outlook June 16, 2010

Eric A. DeVuyst and Derrell Peel, OSU Extension Economists

As producers are weaning their fall-born calves, it's a good time to look at retained ownership options. Utilizing OSU's Retained Ownership Decision Tool, we looked at retaining fall-born, long-weaned steers through preconditioning, grass stocker and feedlot. Calves are assumed to be weaned on July 15 and weigh 641 lb. Current futures prices suggest an Oklahoma July price of $110.35 for calves weighing 622 lb after shrink. Subtracting expenses for sales, weaned steers are expected to return $680/head to the cow-herd. If instead those steers are preconditioned for 45 days, the producer can expect to sell a 698 lb calf, after shrink, at $110 (August) plus a $3 premium for preconditioning. So, the calf earns a $781 check after a 1% death loss. The producer will have another $86/head in expenses, so preconditioning nets about $15/head.

Instead of selling after preconditioning, the producer could put the steers on grass pasture for 60 days. On October 28, 783 lb calves, net of shrink, are sold for a projected $104.18/cwt. The calves are projected to average $810/head after a 0.6% death loss. An additional $127 of expenses are incurred including $18/head for pasture rent. Since the calves earn an additional $30/head versus the added expense of $41/head, grass stocking phase does not appear to be advisable this year—unless the producer has excess pasture with no alternative use.

Retained ownership in the feedlot looks to be loss generating for last fall's calves. Futures prices are around $95, down about $5 from their highs this spring. A 1,255 steer (again net of shrink) earns about $1,196/head (March) after a 0.15% death loss. In the feedlot, steers cost the owner another $448/head. Given that added revenue is only $386/head, retained ownership through the feedlot appears to be ill-advised this fall.

Values presented here are based on many production, cost and value assumptions that may be different for individual producers and may change over time. Producers can analyze their own retained ownership strategies using the Retained Ownership tool. It can be downloaded (for free!) at http://www.agecon.okstate.edu/faculty/publications.asp (author=DeVuyst; type=Spreadsheet).

Statewide Conference for Women in Ag and Small Business, Oct. 14-15

Save the date! Call, e-mail, text your friends and plan to load up the car. This year's Statewide Women in Agriculture & Small Business Conference has an exciting lineup of workshop and keynote speakers. The Keynoter for Thursday is Michele Payne-Knoper (http://www.michelepaynknoper.com/) with Celebrating Agriculture!

The conference will be held October 14-15 at the Moore Norman Technology Center located at SW 134th Street and Pennsylvania Avenue in Oklahoma City. Concurrent sessions will focus on timely topics in agriculture, small business and alternative enterprises. The conference will address personal, family, business and agriculture issues that present unique challenges to women. Every breakout will focus on providing helpful information that will help women be successful in business and personal endeavors.

For registration details, see **www.OKWomenInAgandSmallBusiness.com**

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