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Body Condition at Calving Key for High Rebreeding Rates in First-Calf Heifers

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Over the past 20 or so years, we have accumulated volumes of data on the effects of body condition at calving on rebreeding rates in the beef cow. Clemson University has been involved with research in this area since I came to South Carolina 15 years ago. In short, we and others at a variety of institutions came up with a Body Condition Scoring (BCS) system in which a score of 1 = an extremely thin cow and a score of 9 = a very fat cow. (See Table 1.)

As with all biological systems, scores on either end do not optimize production. All data on mature beef cows indicate mature cows calving with a BCS of 5 will have maximum reproductive performance in the following breeding season. Calving-time BCS of 6 or greater will not result in higher pregnancy rates in mature cows and certainly indicate wasted feed resources (or grass resources) to get cows to those higher BCS.

The first-calf cow appears to be an exception to this recommendation. We recently completed a multi-state research effort in which the effects of BCS at calving on reproductive responses were studied in 240 first-calf beef cows calving as 2-year-olds. These data were accumulated from the states of Oklahoma, Louisiana, and South Carolina, where first-calf cows calving in a 60-day period were monitored for three years. Cows were randomly allotted 90 days before calving and fed to achieve BCS of 4, 5, or 6 at calving. All cows were then group fed through the next 60-day breeding season. There were obvious location effects on production and reproduction (Table 2). However, the important point is that while there were differences in values observed for each state, responses observed based on BCS were very consistent among states. Greater BCS at calving resulted in more cows in estrus and more cows pregnant by the end of the breeding season. Cows calving with BCS of 4, 5, or 6 did have progressively heavier birth weights, but calving problems were not influenced by higher BCS.

Bottom line - when first-calf beef cows calved in BCS of 4, 5, or 6, cows with greater BCS had progressively heavier calves at birth *without* increased calving problems. More cows calving with greater BCS also exhibited heat and became pregnant in the next breeding season than did cows calving with lower BCS. If you study Table 2, you will observe first-calf cows calving in BCS = 6 had calves weighing 4 to 7 pounds more at birth than cows calving in BCS of 5 or 4, respectively, but had no more calving problems. These cows calving in BCS = 6 also had 98% in heat and 96% pregnant in the next breeding season.

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Table 1. System of Body Condition Scoring (BCS) for Beef Cattle

Group	BCS	Description
Thin Condition	1	EMACIATED - Cow is extremely emaciated with no palpable fat detectable over spinous processes, transverse processes, hip bone or ribs. Tail-head and ribs project quite prominently.
	2	POOR - Cow still appears somewhat emaciated but tail-head and ribs less prominent. Individual spinous processes are still rather sharp to the touch but some tissue cover exists along the spine.
Borderline Condition	3	THIN - Ribs are still individually identifiable but not quite as sharp to the touch. There is obvious palpable fat along spine and over tail-head with some tissue cover over dorsal portion of ribs.
	4	BORDERLINE - Individual ribs are no longer visually obvious. The spinous processes can be identified individually on palpation but feel rounded rather than sharp. Some fat cover over ribs, transverse processes and hip bones.
Optimum Moderate Condition	5	MODERATE - Cow has generally good overall appearance. Upon palpation, fat cover over ribs feels spongy and areas on either side of tail-head now have palpable fat cover.
	6	HIGH MODERATE - Firm pressure now needs to be applied to feel spinous processes. A high degree of fat is palpable over ribs and around tail-head.
	7	GOOD - Cow appears fleshy and obviously carries considerable fat. Very spongy fat cover over ribs and around tail-head. In fact, "rounds" or "pones" beginning to be obvious. Some fat around vulva and in crotch.
Fat Condition	8	FAT - Cow very fleshy and over-conditioned. Spinous processes almost impossible to palpate. Cow has large fat deposits over ribs, around tail-head and below vulva. "Rounds" or "pones" are obvious.
	9	EXTREMELY FAT - Cow obviously extremely wasty and patchy and looks blocky. Tail-head and hips buried in fatty tissue and "rounds" or "pones" of fat are protruding. Bone structure no longer visible and barely palpable. Animal's mobility may even be impaired by large fatty deposits.

Richards, M.W., J.C. Spitzer and M.B. Warner. 1986. J. Anim. Sci. 62:300.

Table 2. Birth Weight, Calving Difficulty and Reproductive Performance of First-Calf Beef Cows as Affected by Location and Body Condition Score at Calving

Item		No. Cows	Calf Birth Weight	Calving Difficulty Score	% in Heat / % Pregnant by Days of the Breeding Season		
					20 days	40 days	60 days
Location	LA	74	66 lbs	1.00	44 / 29	69 / 55	82 / 68
	OK	65	66 lbs	1.30	32 / 24	71 / 69	86 / 79
	SC	101	69 lbs	1.30	83 / 57	93 / 75	95 / 85
BCS	4	73	64 lbs	1.20	42 / 27	56 / 43	74 / 56
	5	107	67 lbs	1.20	54 / 35	80 / 65	90 / 80
	6	60	71 lbs	1.20	63 / 47	98 / 90	98 / 96

Calving Difficulty Scores: 1= no assistance, 2 = minor assistance, 3 = calf pullers, 4 = cesarean section.

Spitzer, J.C., D.G. Morrison, R.P. Wettman and L.C. Faulkner. 1995. J. Anim. Sci. 73:1251.