

# CALVING Condition

Do cows have to be BCS 5 at calving?

by Troy Smith

Whether they grew up in the cow business or were drawn to it later in life, most cow-calf producers have relied on sage advice. Maybe it came from Granddad or other wizened mentors — veterans of droughts, bad winters and market swings — who survived and managed cows long enough to use up plenty of herd tally books. Surely, as you learned the ropes, someone warned, “You can’t starve a profit out of a cow.”

That gem has been passed on through generations of cow folk. It’s a good one to remember, too, as costs of feed and the fuel used to deliver it climb skyward, and producers look for ways to trim their budgets. You can’t neglect nutrition. It is a critical factor affecting the cow’s reproductive performance, and the performance of her calf.

For years, a body condition scoring system has been recommended for visually evaluating the relative fatness or body composition of cows. The herd manager can then try to manipulate herd nutrition to achieve “optimum” body condition.

And, for years, evidence from multiple

research studies has appeared to validate another bit of conventional wisdom. When it comes to body condition score (BCS), the middle of the road is best. Based on the generally accepted nine-point scoring system, BCS 5 is widely recommended as optimum for mature cows at calving time. That way,

barring reproductive disease challenges, cows will be “in shape” to recover and rebreed on time. Right?

## New logic

Well, maybe, but do cows have to be BCS 5 to exhibit efficient reproductive performance? New Mexico State University (NMSU) research provides cause to question this blanket recommendation.

According to NMSU nutritionist Mark Petersen, studies at Corona Range and Livestock Research Center suggest the answer

is “no.” And this evidence does not stem from a season or two. It comes from seven years (2000-2007) of data involving 2- and 3-year-old cows grazing native range. That’s an age group considered more vulnerable to nutritional stress.

Don’t misunderstand. This research does not downplay the importance of nutrition

to the pregnant cow. Petersen and his fellow researchers found, however, that it may not be necessary to achieve the “recommended” BCS target to maintain acceptable reproduction, if nutrition is managed strategically.

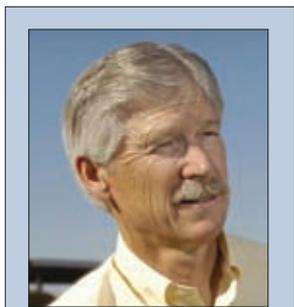
“On average, over seven years, half of our 2- and 3-year-old cows were less than BCS 5 at the time they calved. And 80% of them were less than BCS 5 at breeding,” Petersen says. “Almost 25% of the cows were BCS 3.5 or less, at breeding time. We don’t really want them below 3.5, but we did get some fairly thin cows rebred by supplementing nutrients at the time they most need it — prior to breeding. Having them gaining weight at breeding time is important. It appears to be more important than BCS at calving.”

In fact, 74% of the cows were BCS 4 or less at the start of the 60-day breeding period. Summarizing data from all cows, over all seven years, Table 1 shows pregnancy rates by groups representing three different ranges of BCS. Of the cows evaluated as BCS 4.5 or lower, 91% became pregnant. The postpartum interval, or time between calving and rebreeding, does not appear to be significantly affected by BCS, as 69% of all cows delivered within the first 30 days of the subsequent calving seasons. Ninety-one percent of calves had been delivered within the first 45 days, and 98% within 60 days. Subsequent distribution of calving is summarized in Table 2. Body condition scores for all cows at the time of breeding are summarized in Table 3.

Interestingly, just about all cows lost weight during the 2006 breeding season. It was an extremely dry year. Still, Petersen says, most had cycled prior to turnout of bulls and 94% of the cows were bred in 60 days.

“We feel this may demonstrate the potency of our supplements and the impact of strategic supplementation,” Petersen states. “The cows cycled and got pregnant, even though they were losing weight and in a risky body condition during a drought.”

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► Cows wintered on native range can maintain reproductive performance, even when they fall short of the commonly recommended target of BCS 5 at calving, NMSU nutritionist Mark Petersen says.

**Table 1: Pregnancy rate (2001-2007) for 2- and 3-year-old cows by BCS at breeding in a 60-day breeding season**

	Body condition score		
	4.5 or less <sup>1</sup>	4.5 to 5.25	5.25 and over
Pregnant	288	33	3
Open	29	1	0
% Pregnant <sup>2</sup>	91	97	100

<sup>1</sup>Body condition score for 236 of 317 cows was 4.0 or less. BCS 4.0 identified by visible back ribs.

<sup>2</sup>Overall pregnancy rate for all 2- and 3-year-olds was 91.8% (348/379).

Cows grazing native range at Corona Range & Livestock Research Center, NMSU.

**Table 2: Subsequent distribution of calving (2001-2007) for 2- and 3-year-old cows with a 60-day breeding season**

	Calving date			
	Within 30 days <sup>1</sup>	30-45 days	45-60 days	60-75 days
Cows calving	260	84	29	6
% calving	69	22	7	2

<sup>1</sup>Body condition score for 236 of 317 cows was 4.0 or less. BCS 4.0 identified by visible back ribs.

Cows grazing native range at Corona Range & Livestock Research Center, NMSU.

**Table 3: Body condition scores (2001-2007) for 2- and 3-year-old cows prior to 60-day breeding season.**

	Body condition score						
	3.0	3.5	4.0*	4.5	5.0	5.5	6.0
No. of cows	15	70	151	81	33	2	2
Percentage	4	20	43	23	9	0.5	0.5

<sup>1</sup>Body condition score of 4.0 is identified by visible back ribs.  
Cows grazing native range at Corona Range & Livestock Research Center, NMSU.

## Strategic protein

New Mexico State University (NMSU) research showed that cows wintered on native range can maintain reproductive performance, even when they fall short of the commonly recommended target of body condition score (BCS) 5 at calving. Strategic protein supplementation is credited for enabling thinner cows to post acceptable pregnancy rates after a 60-day breeding season.



► Reproductive physiologist Rick Funston says the research also suggests cow nutrition during gestation affects reproduction in heifer calves kept as herd replacements.

While not focused specifically on the influence of BCS, University of Nebraska studies have explored the effects supplemental protein, or the lack thereof, may have on the reproductive performance of cows maintained at the Gudmundsen Sandhills Laboratory. Nebraska researchers also looked at the feeding performance and carcass traits of calves born to cows involved in the study, as well as the reproductive performance of heifer calves retained for breeding.

Over three years of research, mature cows grazing winter range and receiving no supplemental protein posted pregnancy rates that were not significantly different from cows managed on range and receiving 1 pound (lb.) per head per day of a distillers' grain-based cube containing 28% crude protein (CP). However, even though the absence of supplemental protein didn't hurt subsequent cow reproduction, it appears to have taken a toll on their calves.

Calves born to protein-restricted cows exhibited lower weaning weights and a higher incidence of postweaning sickness. Ultimately, the calves posted lighter finished weights, too, with fewer achieving "premium" carcass quality grades.

Data collected from fed steer calves, representing three subsequent calf crops, showed the effect when calves were finished and harvested. Compared to steer calves born to cows grazing winter range and receiving no protein supplement, steers born to supplemented cows posted finished weights that were, on average, 68 lb. heavier. Carcass weights were 42 lb. heavier. Steers whose mothers received supplemental protein produced at least 16% more carcasses that qualified for premium Choice, or the upper two-thirds of the grade.

The study also looked at the effect of protein supplementation among cows grazing cornstalks. Comparing progeny of supplemented cows to progeny of cows fed no supplement, there were less dramatic differences in finished weight and carcass weight. However, supplemented cornstalk cows also produced calves that graded better than counterparts receiving no extra protein.

Reproductive physiologist Rick Funston says the research also suggests cow nutrition during gestation affects reproduction in heifer calves kept as herd replacements. Daughters of protein-supplemented cows exhibited higher pregnancy rates. In addition, more of those heifers delivered their first calves early in the calving season.

"I believe our data demonstrates the influence of fetal programming (during gestation) and its potential impact on the beef industry," Funston says. "The conclusion drawn from the study, based on the minimal impact on cow performance, is very different than when you consider the impact on the unborn calf."

Seeking alternatives to "traditional" protein supplementation programs may be advisable in an era of high feed costs. But the Nebraska study illustrates how protein nutrition management focusing only on the cow can have unintended consequences.

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— Rick Funston

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So, how were the cows managed to maintain acceptable reproductive performance when, by industry standards, they might be considered too thin? Petersen says the cows at the Corona Center graze “high desert” native range throughout the year and always have access to a loose salt-mineral mix. Naturally, forage quality varies by season and precipitation received.

Precalving supplementation typically

started in December, but was delayed when forage quality allowed. The 2- and 3-year-olds received 0.5 pounds (lb.) per day of a 36% crude protein (CP) supplement. It was delivered once per week in a single feeding of 3.5 lb. per head.

The supplement was 65% rumen-degradable protein (degraded intake protein, DIP) and 35% bypass protein (undegraded intake protein, UIP). In challenging years, when environmental or

nutritional stress was greater, precalving supplementation was increased to the rate of 1 lb. per day. Twice-per-week feedings (3.5 lb. per cow) started 45 to 30 days prior to calving.

As the March-April calving season began, and until about 70 days after calving, supplementation shifted into a higher gear. While it still contained 36% CP, the postcalving supplement consisted of 50% rumen-degradable protein and 50% bypass

protein, fed at the rate of 2 lb. per day. The precalving supplement was cheaper, but increasing the proportion of bypass protein is considered important to enhancing the cow's ability to resume estrous cycling activity.

"Cows experience a drop in glucose (blood sugar) levels after calving. Our supplement is designed to influence production of the metabolic hormone insulin needed to utilize glucose from the

diet and increase availability of energy. Bypass protein helps with that," Petersen explains.

NMSU has also researched supplements containing calcium propionate. Propionate, says Petersen, is a precursor to glucose, which also can increase the availability of energy in cow diets.

"We're not saying BCS is not a good tool. We are always monitoring BCS, but sometimes the year gives us conditions we

did not anticipate, creating management hardships and nutritional stress on the cow herd," Petersen says.

"We can partially overcome these challenges with timely supplementation, in a balanced nutrient package that targets her metabolic limitations," he says. "We have been amazed at how well our young cows rebreed at less-than-optimal body condition."

