The effect of cow body condition score on longevity and replacement rate

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Bouncing around in a new 4-door, extended cab, diesel pickup while looking at cows out in the pasture, I said as tactfully as I knew how, "You've got a nice set of cows. They are a little thinner in condition than desired". I went on to explain how body condition score is related to reproductive performance and calf survival.

"Yeah, but that cow always looks like that and she breeds back every year," the producer responds. I know that he is being a little defensive, justifying in his own mind why the cows are thin, and also showing that while he may believe me intellectually, he doesn't believe me in his heart.

Again, being as tactful as I know how, yet trying to communicate the facts, I said in so many words something like "Yes, I understand. In fact, for every cow that I point out like her, you will be correct more often than not because research suggests that she will breed back 75 to 80% of the time. But, we need to think in terms of ***the total herd*** and not just individuals. While you will prove me wrong on an individual cow more often than not, ***can you be profitable with 75 to 80% calf crop,*** excluding all other reasons for losing calves? Further, she may breed back this year, but what about next year, and the next, and the next? With an 80% breed back, she has a 64% chance of being in the herd after 2 yr. (.8 x .8) and a 51% (.64 x .8) probability of still being in the herd the 3rd year. ***It's like playing Russian Roulette, eventually her luck will run out***. But, there will be an individual cow that will make it to 5 to 6 yr. of age before she culls herself." The real question is if the herd at a given BCS can maintain a level of reproductive performance to be profitable.

It was after such a call, that I got to thinking about the effect of cow condition on the overall average age of a cow herd. Everyone always talks about relating BCS to reproductive performance. But, I had never seen the data on BCS related to cow longevity. What is the probability that a thin cow will stay in the herd more than 5 years? When do the odds of chance catch up with her? Average cow age and replacement rate can indicate how well one is recuperating depreciation expenses.

As a basis for calculation, I used data published a few years ago from a large-scale, commercial ranching operation that pregnancy checked cows at weaning and recorded body condition and cow age. This data set includes 78,407 cows over a 7 year time frame. The uniqueness of this data set is the large number of cows managed under practical range conditions and that there is pregnancy data for each age of cow at each body condition score. I started with 100 cows in each age group ranging from 2 through 11 yr. of age, and maintained 1000 cows in my hypothetical herd. I assumed a cow would be culled for being open in the fall and ignored all other reasons for culling (bad eyes, bad udders, injury, poor calf performance, loss of calf, etc.), except cows were culled after 11 yr. of age. I ran this projection for 15 yr. (i.e. long enough to stabilize cow age and replacement rate).

The following table shows the final results. If all cows in the herd are in BCS 3 at weaning, the average age of the herd will be only 4.52 yr., 28% of the cows will be replaced each year, and a cow has only a 4% chance of being in the herd for her 10th calf. If I manage cows such that they are in BCS 6 at weaning, I will on average get 1.5 more calves from a cow in her lifetime, replacement rate will be only 12.5 %, and a cow has a 65% chance of being in the herd as an 11 yr. old. Now there is a group of cows that are ***completely depreciated and will recuperate overhead expenses!***

It is also important to realize that there are only minimal differences in the cost of the nutritional program between the cows in various condition scores. Wintering costs may be ***lower*** for the better conditioned cows because they have more body reserves and insulation to withstand cold weather. After a good snow, cows in good condition will have snow on their backs, while on the thin cows, the snow will be melted and steam

will be rising off their backs. Another key can be ***late summer and early fall protein supplementation*** to prevent loss of condition. Remember that during late gestation, increased weaning weight will more than offset the cost of protein supplementation. Thus, ***the maintenance of body condition is obtained "free".*** Another key for preventing condition loss is ***weaning on a timely basis.*** Don't let cows get run down and then try to play catch-up later.

Further, this analysis says nothing about stronger calves with a higher survival rate at calving, less scours and lower veterinary bills, cows having enough flesh to be able to milk better and wean heavier calves, etc.

Table 1. The effect of body condition score at weaning on herd age, replacement rate, and probability of a cow being in the herd at 11 years of age.

BCS at Weaning	Average Cow Age	Replacement Rate	Probability of a cow being in the herd at 11 years of age
3	4.52	28.0%	4%
4	5.05	19.3%	15%
5	5.82	13.5%	49%
6	6.02	12.5%	65%

Reference for pregnancy rates by age of cow:

Cherni. 1993. Montana Farmer-Stockman. Vol. 80, No. 7, pg. 10