GRI CONCEPTS

THE CUTTING EDGE OF NUTRITION

The Bulletin *for Alumni of the Beef Cattle Nutrition School*

March 1996

In a profitable Cow/Calf operation it is a necessity that the cows become pregnant, at a reasonable cost. The role of nutrition in this regard is emphasized throughout the School. With limited nutrient availability, an animal will do only what is necessary and forgo other physiological functions. Life is necessary--conception, gestation and lactation are not.

Nutrient partitioning is the allocation of nutrients to various body functions. The cow partitions nutrients in approximately the following order[1]: 1) basal metabolism, 2) activity, 3) growth, 4) basic energy reserves, 5) pregnancy, 6) lactation, 7) additional energy reserves, 8) estrus cycles and initiation of pregnancy and 9) excess reserves. It is apparent that when there are excess reserves (#9), sufficient nutrients are available for the preceding functions to take place.

Excess reserves are partially in the form of subcutaneous fat and are quantitated by body condition score (BCS). Therefore, when the cow's BCS at calving is satisfactory for a given season and location, the probability of all physiological functions occurring normally is high. Included is #8--normal estrus cycles and initiation of pregnancy.

Try To Trick 'em

Normal estrus cycles and initiation of pregnancy are a "bug-a-boo" for many. The interval from calving to estrus (postpartum interval or PPI) often prevents the cow from becoming pregnant during the breeding season. Most commonly, low conception rates result from low BCS at calving. When the rancher is in a BCS bind, he may resort to tricks that could help shorten the PPI.

One such trick for which data is presented in the School is bull stimulation. It is a fairly new approach; thus, not much information is available. It appears, however, that the PPI of cows in lower BCS is shortened. PPI of cows in higher BCS was not impacted and probably does not need to be.

	Present	Restricted	Weaned
Days to 1st ovulation (ave)	35.4	22.5	14.3
Range	(28 to 39)	(11 to 37)	(9 to 18)
Estrus before 1st ovulation %	37.5	25.0	28.6
Duration of cycle	9.4	8.1	11.1
Short cycles (< 12 d) %	87.5	100	71.4

Blame the Calf

A more familiar trick is short duration weaning or some combination of on-off-on lactation. As far as management is concerned, bull stimulation is a passive procedure while weaning is a very intrusive procedure.

It is interesting that interruption of lactation *per se*, does not appear to be a factor in lessening the PPI. Lactating dairy cows in the absence of their calves cycled earlier than those that suckled their young. Further, mastectomized cows that remained with their calves have PPI similar to udder-intact cows that suckled their calves.

In a recent study at Kansas State Univ.[2] multiparous cows remained with their calves until 4 to 9 days postpartum, when they were assigned to three treatment groups as follows:

1. Calf Present - calf had unlimited contact with its dam.
2. Calf Restricted - calf restricted to small pen within the dam's pen so tactile contact was limited to head and neck.
3. Calf Weaned - calf weaned permanently.

Calves in the Calf Restricted group were bottle fed whole milk replacer. Calves in the Calf Present and Calf Restricted remained with their dams for 5 wk, then were removed permanently. Diets of the cows in all groups were adjusted to maintain body weight and BCS.

Results of the study are shown in the accompanying table. Days to first ovulation were considerably fewer for cows in the Calf Weaned group. Cows in the Calf Restricted group also had displayed estrus sooner than the Calf Present cows, suggesting that the mere presence of the calf will delay the onset of estrus.

Percentage of cows experiencing estrus before first ovulation was not different for the three treatment groups. Similarly, there was no difference among treatments for duration of cycle and percentage short cycles. *Short-first cycles within the first 30 to 40 days postpartum are not unusual. They apparently are the result of miscommunication between the reproductive tract, endocrine system and brain.*

Many ranchers employ a 48-hr weaning period prior to the breeding season. The concern is for the well-being of the calf. With a long breeding/calving season, some calves are very young when they are separated from their dams.

High BCS and short breeding/calving seasons are more certain to shorten PPI, with subsequent higher conception rates.

Schools in '96

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[1] Short, R.E., R.A. Bellows, R.B. Staigmiller, J.G. Berardinelli and E.E. Custer. 1990. Physiological mechanisms controlling anestrus and infertility in postpartum beef cattle. J. Anim. Sci. 68:799.

[2] Hoffman, D.P., J.S. Stevenson and J.E. Minton. 1996. Restricting calf presence without suckling compared with weaning prolongs postpartum anovulation in beef cattle. J. Anim. Sci. 74:190.