HERD MANAGEMENT PRACTICES TO CONTROL THE THIN BEEF COW PROBLEM

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For the past 40 years, beginning with Wiltbank's work,[1] studies have documented reduced performance of beef cattle associated with poor body condition due to inadequate intakes of energy and/or protein.[2-4] Thin cows are less productive than cows in good body condition due to: 1) lower pregnancy rates, 2) lower weaning weights of their calves, and 3) lower survivability of their calves. The biggest impairment of productivity in thin cows is their low pregnancy rates.

The impaired productivity of cows in poor body condition leads to great economic losses in beef herds. Two studies utilizing the Texas beef cow body condition score (BCS) system of 1 to 9 categories [5] have shown that the lower production of thin cows results in reductions in gross income per year of approximately $100.00 for BCS 4 cows and $200.00 for BCS 3 cows compared to cows in good body condition (BCS 5.5).[4,6]

Control of the thin cow problem is a big opportunity for beef herds to increase their profits. The best way to manage the thin cow problem is *to prevent it* by maintaining cows in good body condition through proper nutrition, a successful parasite control program and early weaning of calves in specific situations. When prevention fails, other management practices such as adding ionophore antibiotics to the feed, creep feeding calves, short-term removal of calves or bio-stimulation by teaser animals may improve the fertility of thin cows.

Proper Nutrition

The most common cause of thin cows is inadequate intake of energy. Body condition scores are estimates of the energy status of cows and can be successfully used to monitor the nutrition program of beef herds. *The entire year's nutrition program should be designed with a goal of having cows and replacement heifers in excellent body condition at the beginning of the calving season.* Target BCS's beginning of calving season BCS's are 5.5 or better for adult cows and 6.0 or better for replacement heifers. There are 4 key times to evaluate the BCS's of cows in a beef herd: 1) at pregnancy examination, 2) at the onset of the calving season, 3) at the onset of the breeding season, and 4) in the middle of the summer. For many spring-calving herds, the onset of calving falls in the middle of the winter feeding period. If it doesn't, a fifth visit will be needed 2 months into the winter feeding period to evaluate BCS's of the cows and their diet. Corrective actions can be taken when BCS of the herd is found to be too low at any of the herd BCS visits.

The very most important time to body condition score the herd is at pregnancy examination,

because if a thin cow problem is found, there will be enough time prior to calving to correct it by feeding enough for the thin cows to calve in good body condition. Remember, the goal of the entire year's nutrition program is to calve the cow herd in good body condition. When problems are encountered at pregnancy examination, the usual practice is to feed thin (BCS 3 and 4) pregnant cows separately from the good BCS cows. The thin cows should be fed an appropriate energy/protein supplement along with their basic forage diet that will increase their BCS to an average of 5.5 by the time of calving. This is called *"split feeding".* Gains in muscle and fat of 210 pounds by BCS 3 cows and 126 pounds by BCS 4 cows plus 100 pounds of fetus, placenta and fluids must be made for them to reach BCS 5.5 by calving time. Thus, *its important to pregnancy examine the herd 100 days or more before the onset of calving so that adequate time is available for the thin cows to gain the required weight.*

A recent advance in beef cattle nutrition is to feed supplemental fat to first-calf heifers during their last 60 days of gestation or for their last month of gestation and first month of lactation. Generally, 2 to 3 lbs. per head per day of an oilseed (whole cottonseed, sunflower seed or whole soybean) are fed to supply 0.4 to 0.6 lbs. of added fat a day. An increase in pregnancy rates of approximately 10% is commonly seen in the treated heifers.[7] In addition, their calves are more tolerant to cold weather because they are able to maintain their body temperature better and have higher blood glucose concentrations than control calves. Also, the weaning weights of calves of first-calf heifers that are fed supplemental fat are higher than control calves. Supplemental fat has also been shown to stimulate estrus in thin adult cows fed 3 to 4 lbs. of whole cottonseed or sunflower seed daily for 3 weeks before and 3 weeks into the breeding season.[8]

Two main mechanisms are responsible for these benefits. First, the females that are fed fat calve in better body condition than those not fed fat. Second, feeding lipids that are precursors of hormones benefits the endocrine system.[9, 10] Compared to control cows, Brahman cows fed rice bran (18% fat) had higher blood concentrations of insulin, cholesterol and higher peak concentrations of prostaglandin $F_{2\alpha}$. The treated cows tended to have greater follicular populations during their first and second heat cycles.

A benefit:cost prediction must always be calculated before a plan to recondition thin, pregnant cows is implemented. The estimated benefit of moving a cow up one step from a BCS of 3 to 4 or from 4 to 5 is an increase in gross income of $80.00 to $100.00. Moving up from a BCS of 5 to a BCS of 6, however, will improve gross income only $25.00 to $30.00.[4,6] The average BCS of the thin cow group gives an estimate of how much financial benefit can result from improving BCS in the herd. The cost of labor and extra feed will be more precise. Computer software programs can be used to estimate amounts of extra feed that must be fed to reach the BCS goal at calving. A working knowledge of beef cattle nutrition is important in double checking the computer's recommendations. *A rule of thumb is that 1 pound of TDN fed above the maintenance requirements of a cow will result in 0.21 pounds of gain per day.*[6] The ration must be selected very carefully. Purchasing sacked feed can be very expensive. It would cost $64.00 to increase a cow's weight by one BCS (about 75 pounds) in 100 days by feeding 53% TDN, 8% protein Range Breeder Cubes at $5.75 per 50 pound bag. That is the most costly way to increase one BCS that is possible. Hopefully, a cow can be moved up one BCS for less expense by

utilizing bulk rather than sacked feeds.

Some operations utilize liquid molasses supplements to reduce labor requirements of supplementation. Extreme caution must be used in recommending that type of supplement. Even though they are very expensive, the non-protein nitrogen (NPN) such as urea commonly included in liquid supplements may not supply the amount of protein needed to balance forages with low concentrations of protein. In the rumen, energy is required to change the NPN into bacterial protein that is digested and absorbed further down the gastrointestinal tract. Low-protein forages are generally also low in energy. *An important rule of thumb is that NPN cannot raise the protein concentration of the diet above 14% of the total digestible nutrients (TDN) concentration in the forage.* If the protein concentration in the basic forage is 14% or greater than the TDN concentration, adding NPN to the diet will not increase its percentage of protein. For example, if cows are fed hay that has 50% TDN and 7% protein none of the NPN in a supplement fed with it would be converted to protein, even though this hay contains less than a cow's protein requirement! Another important fact about NPN is that when feed labels of molasses supplements say 22.9% protein followed by "includes not more than 10% equivalent protein from non-protein nitrogen" *it does not mean* the supplement is 22.9% protein, made up of 10% protein from NPN and 90% natural protein. This does mean that the supplement contains 12.9% natural protein and if all the NPN were converted to bacterial protein, it would add 10% protein to the product to make it a 22.9% protein supplement. Remember, none of the NPN in the supplement would be converted to protein if the protein concentration of the basic forage is 14% or greater than its TDN concentration. Then, only the natural protein in the product would be available to the animal making it a supplement of 12.9% protein, not a protein supplement at all!

The benefit:cost ratio of reconditioning thin pregnant beef cows between pregnancy examination and calving can be very positive. Each ranch is unique, however, making it very important to evaluate the specific circumstances responsible for a thin cow problem and to carefully plan its solution. The timing of return of investment from reconditioning thin pregnant cows is another consideration. The increased income of feeding thin, pregnant, spring-calving cows better over the winter is spread over the first fall (higher weaning weights) and the second fall (higher weaning weights; more calves to sell). The first fall the reconditioned group will have higher pregnancy rates, but that will not result in increased weaned calves until the second fall. *It's of critical importance to monitor the recommended feeding program to insure that it is being carried out as planned and the cows are responding as expected!*

A thin cow problem identified at the herd visit to body condition score cows at the onset of calving rather than at pregnancy examinations will be more difficult to correct because it is much easier for cows to gain weight in the last trimester of gestation than when they are lactating. Sorting and feeding the thin cows grain (flushing) for 3 weeks before the start of the breeding season and 3 weeks into the breeding season combined with 48-hour calf removal will increase the pregnancy rates of thin cows up to 15%. A careful financial evaluation must be done before this action is recommended, because it usually will have a negative or only a barely positive benefit-cost ratio making it a risky proposition.[11] Early weaning of calves is the best solution for

cows that are thin at calving or the start of the breeding season.

Control of Parasitism

Uncontrolled internal parasitism plus or minus external parasitism can have a marked negative impact on fertility especially in younger animals. The need for treatment of adult cows for stomach worms varies with different regions of the United States and is controversial. Of course, different climate patterns account for the differences.[12] Special efforts, however, to control parasites in replacement and first-calf heifers will enhance their fertility because they generally have less immunity to parasites than adults.

The specific parasites of concern vary throughout the United States. In most regions of Texas, our parasitologist recommends treatment of females for stomach worms in the late spring and late fall. South and east Texas are heavenly environments for *Ostertagia ostertagi* because of the shaded mat formed by bermudagrass, our most common pasture grass. Cows properly treated for stomach worms were found to weigh more and have higher pregnancy rates than cows who were not treated in a study conducted in south Texas.[13] In some areas, drugs effective against liver flukes are needed at the fall treatment.

Control of external parasites is also important for optimal health. Pour-on macrocyclic lactones are used when possible for their activity in lice control. Many ranches utilize various combinations of pour-ons, insecticide-impregnated ear tags and back rubbers to control horn and face flies.

Early Weaning

Early weaning of calves is a successful management practice that is gaining in popularity in the United States beef cattle industry. It is a cost-effective practice that results in increased pregnancy rates in thin cows, late-calving cows and in first-calf heifers. Early weaning can increase conception rates as much as 30% in short breeding seasons.[14,15] Cessation of nursing stimulates estrus. The decreased postpartum interval results in females becoming pregnant earlier in the breeding season, which leads to heavier weaning weights in their calves. In addition, early-weaned first-calf heifers require approximately 50% less TDN to achieve and maintain moderate body condition than lactating first-calf heifers.[14]

Calves, at least 60 days old, are removed from their dams 1 week before the beginning of the breeding season. The calves are then placed on a diet of hay plus grain or pasture plus grain. The calves will gain weight very efficiently and on proper diets will weigh more at the regular time of weaning than calves left with their dams. Weight gains of calves are more efficient when they are fed directly rather than through the cow. An added benefit is that early weaning has been shown to improve the percentage of calves grading USDA Choice or higher by over 30% compared to normal weaned calves. [14]

Other Management Practices

Other management practices have been helpful in improving the reproductive performance of thin cows such as adding ionophore antibiotics to their feed, removing calves for 48 hours, creep feeding calves or exposure of cows to teaser bulls in the postpartum period. Various combinations of the above procedures have also been used. These practices have all been shown to shorten the postpartum period to first estrus and increase the pregnancy rates of thin cows. They are viewed as procedures that could help improve fertility when added to the basic husbandry practices discussed above that maintain good body condition in beef cows.

Conclusions

Management of body condition through proper nutrition, parasite control and early weaning of calves in specific situations is the solution to increasing the fertility of thin beef cows. To be successful, veterinarians who serve beef herds must have an understanding of sound animal husbandry practices in addition to disease control. They must be adept at body condition scoring of beef cows and have a working knowledge of beef herd nutrition. *Control of the thin beef cow problem is a golden opportunity for veterinary practitioners to become involved in beef herd consultation in a way that has a very positive economic benefit to their clients.*

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