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LIVESTOCK

Late-gestation heifer nutrition does not affect dystocia

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According to the U.S. Department of Agriculture Animal and Plant Health Inspection Service, 28 percent of all calf deaths before weaning are due to birth-related problems. Therefore, managing females to calve with minimal difficulty is extremely important. A topic that is often discussed in cattle production is whether or not the level of nutrition given to a pregnant female late in gestation affects birth weight and calving difficulty (dystocia). Many producers worry that providing good nutrition to a pregnant female – especially heifers – increases birth weight of the calf and, subsequently, dystocia. However, providing inadequate nutrition can have long-term effects on pregnancy rates and profitability. This is a topic that has been very well researched over the past several decades.

Protein and Energy Supplements

Houghton and Corah (1989) assembled an extensive review of studies examining the effect of pre-partum energy supplementation, protein supplementation and cow condition at calving on birth weight and dystocia.

Ten studies were summarized in which differing levels of energy were offered (high energy, more than 100 percent of National Research Council requirements; moderate energy, approximately 100 percent of NRC

requirements; low energy, less than 100 percent of NRC requirements). In nine of the 10 studies, moderate or high energy increased birth weights; however, only two of those 10 studies reported an increase in dystocia when feeding higher energy levels. One study actually reported an increase in dystocia when feeding lower energy levels.

Five studies were summarized in which differing levels of protein were offered (high protein, more than 100 percent of NRC requirements; moderate protein, approximately 100 percent of NRC requirements; low protein, less than 100 percent of NRC requirements). Two of the five studies showed increased birth weights when feeding high protein versus low protein diets. One of the five studies showed increased dystocia with increased protein, and one study showed decreased dystocia when feeding increased protein. In general, calf vigor was also decreased when feeding lower levels of protein.

Body Condition Score and Pregnancy Rate

Body condition at calving was also examined in five studies. These studies demonstrated two important messages. First, dystocia is increased in obese (BCS > 7) compared to moderately conditioned females. Second, dystocia is not decreased in thin females compared to those of adequate body condition; however, calf vigor is decreased.

In addition, most research agrees that body condition score at calving is the most important factor affecting subsequent estrus and ovulation, and, therefore, pregnancy rates. Table 1 shows the relationship of BCS to pregnancy rate and calving interval.

Table 1. The relationship of body condition score to pregnancy rate and calving interval.

Body Condition Score, 1-9 scale	Pregnancy Rate, Percent	Calving Interval, days
3	43	414
4	61	381
5	86	364
6	93	364

Adapted from Kunkle et al., 1994

Several studies agree that pregnancy rates increase from about 60 percent at a BCS of 4, to 79 to 86 percent at a BCS of 5 and to 90 to 92 percent at a BCS of 6. However, these differences can be much greater in first- and second-calf heifers. In a Florida study, pregnancy rate was only 50 to 53 percent for first- and second-calf heifers with a BCS of 4 compared to 84 to 90 percent of those with a BCS of 5 or greater. Therefore, it is imperative that heifers are in adequate body condition at calving and provided an adequate plane of nutrition through the breeding season to maintain future production.

Fetal Programming

Research has shown that inadequate nutrition in the last two-thirds of gestation can decrease muscling and marbling potential. Other complications reported from inadequate nutrition during gestation include increased abortion, decreased birth weight, reduced ability of the calf to produce body heat after birth, increased sickness and death, poor growth performance, and reduced meat quality.

While there is an argument that calves whose dams were nutrient restricted during gestation may be more efficient later in life, one study showed no difference in intake, average daily gain or feed efficiency. This topic is not completely understood and needs more research.

Maternal nutrition may also affect the fertility of the calves born. In a Nebraska study, Martin et al. (2007) showed that heifers born to supplemented cows had a pregnancy rate of 93 percent compared to 80 percent for heifers from unsupplemented cows. In addition, 77 percent of these heifers calved in the first 21 days, whereas only 49 percent of the heifers from unsupplemented cows calved in the first 21 days. This could have long-term implications because, typically, heifers that calve early tend to calve early the rest of their lives, and calves that are born early should weigh more at weaning.

Given specific goals, resources and abilities, some producers may be able to capitalize on reduced feed costs and potential increases in efficiency when developing heifers to lighter weights. However, there can be risks to this approach, and due diligence should be given to the risk and reward of such situations, especially in times of record-high prices.

There is a wealth of data on the subject of bred heifer nutrition. The data supports that, for most producers, the ideal BCS of a bred heifer at calving is 6. If a producer's goal is to decrease calving difficulty, selecting bulls for calving ease and providing proper nutrition to heifers will yield much better results.

References available upon request. ■