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ROLE OF ENERGY IN REPRODUCTION

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Introduction

Genetic improvement of dairy cows has markedly increased milk yield over the last three decades. Increased production has been associated with reduced conception rates .The metabolic demands for higher production are related to the decline in reproductive performance in cows. During early lactation, increasing dietary intake fails to keep pace with rising milk production. The resultant negative energy balance and rate of mobilization of body reserves appear directly related to the postpartum interval to first ovulation and lower conception rate. Delay in the onset of normal ovarian activity may account for the decrease in fertility. Negative energy balance probably acts similarly to under nutrition and may manifest in delayed ovarian activity by impinging on pulsatile secretion of LH

Energy And Reproduction

It is estimated that about eighty percent of the infertility problems are environmental, of which more than fifty percent is explained by nutrition. Even predisposition to infectious diseases can be caused or increased by nutritional failures. There fore balanced feeding is fundamental to milk production as well as health and fertility.

Energy is an important nutrient for dairy cows both before and after calving and there is no substitute for energy in the diet of ruminants. A balance of energy and protein is required, even before calving and in early lactation.

An energy deficiency before calving may leads to metabolic stress with sub clinical ketosis and liver damage followed by higher incidence of retained placenta, endometritis and low conception rates in the following lactation.

The negative effect of an insufficient energy provision before calving will be enhanced by an energy deficiency following parturition .It is a common knowledge that early lactating cows do not eat as much feed as they do during later lactation, even though the level of milk production may be the same. Feed intake lags behind the milk production until about 2 to 3 weeks after peek production. This result in a negative energy balance and subsequently body tissues are mobilized to overcome the energy deficit which results in weight loss of animals. Although it is normal for high producing cows to loose weight in early lactation, the energy and especially protein available from the body stores can supply only a limited amount of her needs. As body fat is mobilized proportionally more energy is available than protein. Therefore, usually the percentage of protein in the ration during early lactation may be increased to maximize the energy utilization and to meet added protein needs. Diets high in crude protein support high milk yield, but are also associated with lower reproductive performance. High protein can result in elevated blood urea concentration that affect the uterine environment and also suppresses ovarian activity. Following parturition energy from any source is important for proper uterine involution and for onset of ovarian activity.

Energy deficiency leads to anoestrum, silent heat, delayed ovulation and follicular cysts. This delays the time of first ovulation through inhibition of LH pulse frequency and low levels of blood glucose, insulin and insulin-like growth factor-I (IGF-I) that collectively restrain estrogen production by dominant follicles. . Negative energy balance reduces serum progesterone concentrations and fertility. Significant correlation exists between fertility and weight loss or reduction in bodily conditions, as indicators of negative energy balance in the early weeks of lactation. It is reported for every 1% change in body weight there is a corresponding change in the conception rate. It has been proved that if the weight loss between calving and 60 days post partum is 5% there should be concern , and if it exceeds 10% then there is likely to be poor fertility .Action needs to be taken before the problem occurs, which means regular weighing using length-girth measurements. There are reports of embryonic mortality in cows with energy deficiency and even the result of treatments

for conditions such as endometrits depends on the nutritional status of the animal.

At present we are following the thumb rules of feeding for computation of ration for cattle. Under such circumstances we relay on compounded concentrate mixture, which will provide at least 20% CP [14-16%DCP] and 68-72%TDN. But the requirement of a cow producing more than 15 liters of milk per day or a buffalo producing 10 liters of milk or more per day cannot be met by thumb rules of feeding especially with straw as the major roughage source.

As the level of milk production increases, either the cow must eat more quantity of feed or the feed must contain more nutrients per kilo gram of feed. The later seems to have become more popular in recent years. The amount and density of nutrients in the ration are increased by the addition of grains such as maize, raggy, rice etc. This seems to work for a while since as more grain is fed, more nutrients are consumed per Kg of ration and a grater amount of dry matter is consumed.

Unless good strategies and practices are used as the level of energy is increased, feed intake may decline due to the occurrence of acidosis type of conditions caused by the lack of roughage in the ration. Such diets are usually associated with reduced milk fat percentage and diarrhea of dietary origin. To over come this critical situation at least 10kg of green fodders like CO3 maize, guinea grass, should be supplied to meet the energy requirement.

Conclusion

To conclude, increased capability for milk production has been associated with a decline in fertil ity of lactating cows. Nutritional requirements in crease rapidly with milk production after calving an result in negative energy balance. Nutritional inter actions resulting in poor fertility of high producin dairy cows include the antecedent effects of nega tive energy balance and effects of high dietary pro tein.

Refernces

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