

NUTRIENTS AFFECTING REPRODUCTION OF ANIMALS

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The relationship between various nutrients and reproduction of animal is a topic of concern among dairy farmer, veterinarians, feed manufacturers and extension workers. The researchers have made progressive work for finding the factors that are responsible for the proper reproduction in dairy animals. The deficiency of various nutrients causes the loss of body weight and so body condition, delayed onset of puberty increases the postpartum time interval to conception, hampers the normal ovarian cyclicity by decreasing gonadotropin hormone secretion and so, increases infertility in animals. It has been seen anestrus condition with anovulation or ovulation without estrus sign due to inadequate nutritional of animals because inadequate nutrition leads to negative energy balance in animals. Due to poor -nutrition is more number of services for conception required which ultimately decreases the production performance of the animal. Infertility of animals cases the huge economic loss of the dairy farmers. So to make dairy farming profitable optimum nutrition is necessary for reproduction and health of animals as proper nutrition increases the production and immunity of the body.

Different Nutrients and Their Role in Reproduction

Energy

Energy balance is maybe the most important nutritional issue associated with the poor performance of animals. Restricting energy intake during late pregnancy increases the length of postpartum anestrous and decreases subsequent pregnancy rate. But, more intake of energy during late lactation stage and the non-lactation stage can cause “fatty cow” condition, which ultimately reduces reproductive performance in the next lactation stage. The heifers fed insufficient amounts of energy, their sexual maturity delayed. If animals are over-conditioned, during calving, they have a higher risk of various health disorders like retention

of placenta, different uterine infections and cystic ovaries. Fatty acids and cholesterol are substrates for many hormone syntheses so, increasing fat level in the diet may increase levels of various reproductive hormones (progesterone, prostaglandins). Ruminant's ration should be less than 3-4 per cent fat. Lactating animals are to be supplemented adequate amount of as they have more energy requirements.

Protein

Inadequate intake of protein can reduce the reproductive performance of animals. However, excessive intake of protein or urea has been associated with low pregnancy rates in female dairy animals. Overfeeding during the breeding time interval and early gestation may be linked with decreased fertility rate in animals. Animals fed excess protein (more than 10-15% on top of requirements) required more services per conception and have longer birth intervals. Feeding urea and protein during early lactation with a diet containing 16 % protein and late wet animals with a diet containing 12 % protein should maintain the reproductive efficiency of the animals.

Minerals

Minerals are necessary for different physiological processes in animals. Reduced fertility, intake of feed, milk yield, reduced ovarian activity, discontinuous oestrous cycles, increased risk of cystic ovaries and delay of sexual maturity may be due to low phosphorus intake. The diet with 0.45 - 0.50 % phosphorus on a DM basis should be provided to high milking animals. Lactating animals must always be being provided proper amounts of calcium (Ca) for optimum production and reduces health problems. Reduction in a muscle contraction may lead to a decrease in dry matter intake as so it leads to severe negative energy balance (NEB). The major issue in the mineral nutrition of non-lactating animals is to provide an optimum concentration of calcium and phosphorus to decrease the risk of milk fever. The diet with 0.75 - 0.80 per cent calcium on a DM basis should be given to high producing dairy animals. Selenium is important for normal spermatogenesis and a component of various enzymes like selenoproteins phospholipid hydroperoxide glutathione peroxidase and Selenoprotein. Diets should contain at least 0.1 ppm selenium on a dry matter basis. Zinc is necessary for proper maintaining sexual maturity, reproductive performance, and the onset of estrus. Zinc has a role for the repair and maintenance of the lining of the uterus following parturition. Recommended dietary concentration of zinc for dairy cows is between 18 to 73ppm. Copper is an essential component of several enzymes including superoxide

dismutase, lysyl oxidase and thiol oxidase. Early embryonic death, Retained placenta and necrosis of the placenta are the symptoms of copper deficiency. Manganese has an important role in cholesterol synthesis, which is required for the synthesis of the steroids, estrogen, progesterone and testosterone hormone. Insufficient steroid production results in reduced concentrations of these hormones causing abnormal sperm in males and discontinuous estrus cycles in females.

Vitamins

Proper vitamin level must be provided in dry cow rations when feed intake is restricted, or low-quality forage is fed to animals. To ensure proper intake of vitamins should be fed in small amounts of low energy concentrates or mixed in a complete dry cow ration. Vitamin A is required for maintaining healthy tissue in the reproductive tract. In deficient animals may have a delay in sexual maturity, birth of the dead or weak newborn calves, and retention of placenta, metritis and abortion. So, supplementation before and after calving can increase conception rate. Daily supplementation of vitamin A for farm cattle is 30,000-50,000 units. Vitamin E acts as antioxidant reducing the different free radicals and converts them into non-reactive forms. The harmful effect of vitamin E and selenium deficiencies have been noticed on various components of the reproductive capacity, including ovulation rate, sperm movement and transport, conception rate, expulsion fetal membrane, milk yield and post-natal growth.

Conclusion

Nutrients are directly related to reproduction in the dairy animals. Nutrient either in deficient amount or excessive amount is capable of altering the reproduction of animals. The improvement of the reproductive performance will result in higher profitability, so both nutrition and reproductive management system is a better method for the better economic efficiency of animal husbandry.

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