

Synergistic Effect of Vitamin E and Selenium in Anoestrus cows for improvement of Conception rate

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Soils according to geographical distribution in some areas of India are deficient in selenium. Therefore, crops grown on these soils also are low in selenium and produce deficiency diseases. As commercial dairy owners depend mostly on home grown grains, forages and less on purchased feed. Bio-availability of selenium after absorption through intestine to the animals depends mainly on physiological function. The relationship between nutrition and reproduction is of importance to dairy producers, veterinarians, feed producers and Extension workers, hence selenium and Vitamin E supplementation in mineral mixture will help in improving reproductive performance.

Synergistic Effect of vitamin - E and selenium

Selenium is a trace element found in soil and plants. Selenium enhances the activity and improves the transport and retention of Vit.E across the cell. The alkaline soils, use of excess sulphate fertilizers deplete the plants from selenium. Heavy rain may also wash this element from the soil. Selenium deficiency occurs in animal feed when the level is less than 0.05 ppm. Selenium deficiency produces muscular dystrophy (white muscle disease), atrophy of the endocrine glandular tissue of the pancreas resulting in loss of zoning of the cells. Acini shrink, become uneven in size with replacement of fibrous tissue, decreased production of enzymes, lack of lipase and reduced absorption of fats and fat soluble vitamins. Requirement of vitamin-E is higher in selenium deficient animals. Selenium improves growth and hatchability of eggs in fowls. Plants of the genus *Astragalus* and *Oxytropis* contain high percentage of selenium i.e. 500 - 15,000 ppm. Selenium interferes with action of enzymes sulphur containing amino acids because selenium is antagonistic to sulphur, hence biological processes are affected resulting in necrosis. Acute poisoning with selenium is observed in animals

that consume a large quantity of seleniferous substances. Gastro-enteritis, respiratory and myocardial failure, polydipsi, polyurea, discomfort due to abdominal colic. Animal press their head on hard objects, vision is affected, the animal dashes to obstacle, paralysis and weakness of legs. Respiratory failure, dyspnoea, synusis and lastly death are combinely known as "blind staggers". Moderate anemia associated with fall in hemoglobin level to 7 gms % is observed. Selenium deficiency in cows and eves has been reported to cause retained placenta, abortions, embryonic-fetal losses, poor fertility, degenerative changes in uterus, cystic ovaries, increased time of uterine involution, dystokia. Non-specific neonatal mortality, unthriptiness in cows, lambs and goats, diatic hepatosis in swine are caused due to selenium deficiency. These diseases are known as "Selenium responding diseases". Incidence of diseases of non-infectious nature such as milk fever, metritis and mastitis occur more due to selenium deficiency. Selenium deficiency makes the animals prone to inter-current infections due to poor body resistance/defense mechanism caused due to leucopenia leading to anemia. Immediately after post partum period cows immune system is challenged severely and innate and humeral defenses are reduced hence selenium administration prepartum and postpartum is beneficial for enhancing reproductive efficiency. Diets should contain at least 0.1 ppm selenium on a dry matter basis while Vit - E, 10 - 15 IU/kg body weight daily should be given by oral route. Lipid soluble Vit.E causes degeneration of germinal epithelium of testicular tissues and inhibitions of spermatogenesis and Se (as alfa-tocopherol acetate) have diverse cellular antioxidant functions. Super ovulated beef cows on an adequate plane of nutrition, supplemented with Se and Vit.- E had high fertilization rate near about 100% due to enhanced sperm transport and increased uterine contractions, while

41% ova fertilized in unsupplemented cows. Selenium preferentially accumulates in the placentome, ovary, pituitary, adrenal glands and testis suggesting specific requirements of selenium in those tissues.

References

1. Alderman, G. (1963), Mineral nutrition and reproduction in cattle. *Vet. Rec.* 75: 1015.
2. Ammerman, C. B., and S. M. Miller. (1975), Selenium in ruminant nutrition: A review *Journal of Dairy Sci.* 58: 1561.
3. Arthur, J. R. and R. Boyne. (1985) Superoxide dismutase and glutathione peroxidase activities in neutrophils from selenium deficient and copper deficient cattle. *Life Sci.* 36: 1569.
4. Conrad, H. R., W. E. Julien, and A. L. Moxon. (1976), Plasma selenium levels in supplemented and selenium deficient dairy cows. *Distillers Feed Res. Coun. Proc.* 31:49.
5. Buchanan-Smith, J. G., E. C. Nelson, B. I. Osburn, M. E. Wells and A. D. Tillman. (1969) Effects of vitamin E and selenium deficiencies in sheep fed a purified diet during growth and reproduction., *J. Anim. Sci.* 29:808.

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