

Iodine deficiency

Etiology

Iodine deficiency may be due to the deficient iodine intake or secondary by high of calcium.

Occurrence

The importance of sub clinical deficiency as a cause of neonatal mortality could be much greater than clinical disease .

Young animals are most likely to bear goitrous offspring than older ones and this may account for the apparent breed susceptibility of Dorset horn sheep which mate at an earlier age than other breeds.

Pathogenesis

- iodine deficiency result in decrease production of thyroxin and stimulation of the secretion of thyrotropic hormone by the pituitary gland → hyperplasia of thyroid tissue and enlargement of thyroid gland.
- The primary deficiency of thyroxin is responsible for the severe weakness and hair abnormalities of the affected animals.
- A hyperplastic goiter is highly vascular and the gland can be felt to pulsate with the arterial plus loud murmur may be audible over the gland .

- Iodine is an essential element for normal fetal brain and physical development in sheep. A severe iodine deficiency in pregnant ewes causes reduction in fetal brain and body weight from 70 days of gestation to parturition.

Clinical findings

- 1- Although loss of condition, decrease milk production and weakness might be anticipated these signs are not usually seen in adults.
- 2- Loss of libido in the bull, failure to express estrus in cow and high incidence of aborted, stillborn or weak calves have been suggested as manifestations of hypothyroidism in cattle whereas prolonged gestation is reported in mares, ewes and sows.
- 3- A high incidence of still births and weak newborn animals is the most common manifestation of iodine deficiency.
- 4- Partial or complete alopecia and palpable enlargement of thyroid gland are the signs that occur most frequently in different species.
- 5- Excessive flexion of the lower fore legs and extension of lower parts of the hind legs has also been observed in affected foals.

- 6- Defective ossification has also been reported , the manifestation in collapse of the central and third tarsal bones leading to lameness and deformity of the hock.
- 7- Adult sheep in iodine deficiency areas may show a high incidence of thyroid enlargement but are clinical normal in other respects.
- 8- New born lambs manifest weakness, extensive alopecia and palpable (if not visible) enlargement of thyroid glands.
- 9- Goat present a similar clinical picture (more severe than sheep).
- 10- Animal survive the initial danger after birth may recover except partial persistence of goiter.

Clinical pathology

- 1- Estimation of blood iodine levels.
Normal range (2.4-14 mg/100ml).
- 2- Estimation the iodine conc. In milk.
The conc. Below 8mg/L indicate iodine deficiency.
- 3- Levels the thyroxin in the blood have not been much used to measure the thyroid gland sufficiency in animals.
- 4- Blood cholesterol levels have been used as an indicator of thyroid function in human but are not used in the investigation of goiter in animals.

Differential diagnosis

- 1- Iodine deficiency should be differentiated from other causes of abortion and stillbirth such as brucellosis.
- 2- Vit A def. (weakness).
- 3- Cobalt def. and copper def. (coat lesion).

Treatment

- 1- Treatment of neonates with obvious clinical evidence of iodine deficiency is usually undertaken because of the high case fatality rate.
- 2- Addition of iodine to the diet of pregnant dams.
- 3- Potassium iodine 6-10gr with water orally.
- 4- Vit A or fish oil (440 IU/kg bw) Vit A daily for 7 days
- 5- Thyroxin tablet for calves and lambs. On tablet (3mg) daily for 7 days.

Daily requirement of iodine is 0.8-1.0 mg/kg Dm of feed for lactating and pregnant cows and 0.1- 0.3 mg/kg Dm of feed for non pregnant cows and calves.