Zink deficiency (Parakeratosis)

Etiology

1- A primary Zink deficiency due to dietary Zink in ruminate is rare but dose occur.
2- Many factors influence the viability of Zink from soil including
a)**compaction of the soil**
b)**nitrogen and**
c**) phosphorus increase.**
3- Consumption of immature which gross which affected digestibility, the **feeding of late – cute hay which may be poorly digestible** and the **presence of excessive dietary sulfur.**
All these cause secondary Zink deficiency.

Pathogenesis

1- **Hnzyme carbonic anhydrase**: Zink is component of the enzyme carbonic anhydrase which is located is **red blood corpuscles** (RBC) and **parietal cells** of the stomach and is related to the:
a) transport of respiratory carbon dioxide
b) the secretion of hydrochloride acid by the gastric mucosa.

2- **Hormones:** Zink also associated with:

a) RNA function

b) related to insulin,

c) glucagons and other hormones**.**

3- **Keratinization:** Zink also have a role in:

a) keratinization,

b) calcification,

c) wound healing

d) somatic and sexual development.

4- A Zink deficiency results in a **decreased feed intake** in all species and probably the reason for the **depression growing rate** in growing animals.

5- **Protein synthesis**: Failure of **keratinization result in:**

a) parakeratosis,

b) failure of growth of wool and hair

c) lesions of the coronary bands

All these probably reflect the importance of Zink in protein synthesis.

Clinical Findings

1- In naturally occurring disease in cattle, in severe cases, parakeratosis and alopecia may affect about 40% of skin area. The lesions are most marked on the muzzle, vulva, anus , tail- head, ears, backs of hind legs, kneefold, flank and neck.

2- Most animal are below average body condition and are stunted in growth.

3- After treatment with Zink improvement is apparent in 1 week and complete in 3 weeks.

4- **Experimentally** produced cases exhibit the following sings

   a- Poor growth
   b- A stiff gait
   c- Swelling of the coronates, hocks and knees.
   d- Soft swelling containing fluid of the anterior aspect of the hind fetlock.
   e- Alopecia
   f- Wrinkling of the skin of the legs, scrotum and on the neck and head especially around the nostrils.
   g- Haemorrhage around the teeth.
   h- Ulcers of the dental pad.

The natural disease in sheep is characterized by :-

1- Loss of wool and the development of thick, wrinkled skin.
2- Wool eating also occur in sheep.
3- Induced cases in lambs is exhibited reduced growth rate, salivation, swollen hocks, wrinkled skin and open skin lesion around the hoof and eyes.
4- Experimental disease in goats is similar to that in sheep.
5- Impaired testicular growth and complete cessation of spermatogenesis in ram lambs.

Clinical pathology

- Skin biopsy (parakeratosis)
- Estimation of Zink un blood (normal level 8- 120 mg/dl) in sheep and cattle.

Differential diagnosis

1- Mange
2- Exudative epidermitis

Treatment

1- Zink sulfate 300 mg / in water daily for two weeks.
2- The injection of Zink at rate of 2-4 mg/kg bw daily for 10 days also effective.
3- Zink oxide suspended with olive and given 1/m at dose of 200mg of Zink for lamb.