

# Management of Zinc Responsive Dermatitis (Parakeratosis) in Buffaloes: A Report of 10 Cases

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## Abstract

*Dermatitis due to zinc deficiency in buffaloes brought to the clinic was described in the current report. Scaly, eczematous lesions and areas of alopecia were observed at various parts of the body (face, ears, legs, udder, perineum, vulva, etc). Cracking at coronet and below the hock regions were also observed. Oral supplementation of zinc sulphate and topical application of zinc oxide resulted in complete resolution of the skin lesions.*

**Keywords:** Zinc responsive dermatitis, parakeratosis, and buffaloes

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## INTRODUCTION

Zinc responsive dermatitis can be seen in buffaloes, pigs, sheep and goat [1]. It may be acquired by grazing in pastures of/feeding roughages (paddy straw, groundnut hay) grown in zinc deficient soils or due to inherited poor intestinal uptake of zinc [2]. Causes of zinc deficiency include feed deficient in Zinc, feed with excessive calcium, iron, phytates and other chelating agents, drinking water with excessive iron and other chelating agents [3]. Due to zinc deficiency in buffaloes, feed intake decreases leading to stunted growth, failure of keratinization and reduced protein synthesis [4]. As zinc is rich in skin, hair and wool, deficiency signs will first appear in these areas.

Major signs include alopecia, scaly and eczematous dermatitis at ears, face, vulva, tail head, udder, teats and legs. Animals with true zinc deficiency may show systemic signs like decreased appetite, growth rate, weight loss, decreased milk production, depression, stiff joints and diarrhoea [3]. Swelling of coronet region is another important symptom seen in severe zinc deficiency leading to lameness and stiff gait. Zinc is integral component of rapidly dividing cells, including those of the epidermis

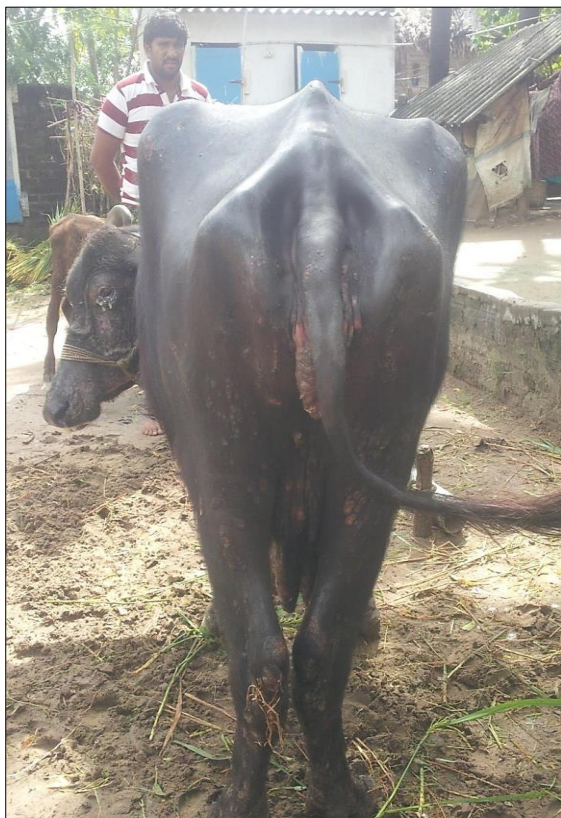
[5], thus deficiency results in failure of keratinization, which leads to parakeratosis, loss and failure of growth of hair, lesions of coronary bands [6]. The present study reports dermatitis in 10 buffaloes which could successfully recover with oral supplementation and topical application of zinc.

## Case History and Observations

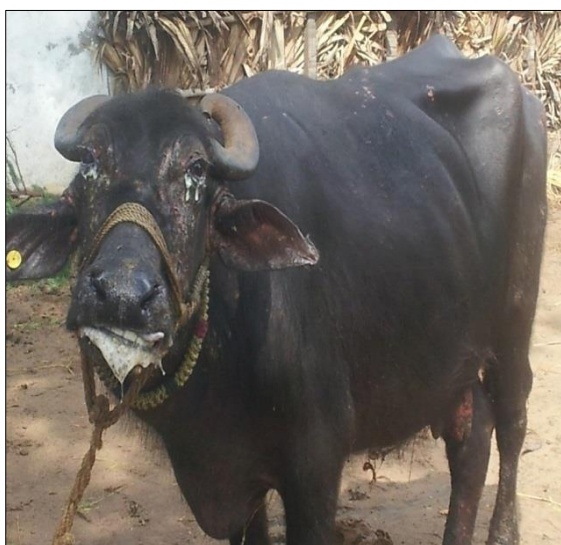
Ten pluriparous buffaloes (ND and GMB) of different ages and stages of lactation were presented to Veterinary Dispensaries, Bhattiprolu and Nizampatnam (Guntur district, Andhra Pradesh, India) in months of August, September and October with complaints of alopecia, dermatitis, dysgalactia and lameness. Farmers reported that they were fed solely on paddy straw and groundnut hay without mineral mixture apart from little greens.

On clinical examination, all the animals were showing symptoms of mild to severe in nature, viz. dullness; low plane of nutrition; bilateral purulent conjunctivitis (Figure 2); ulcerative, eczematous and wrinkled skin with alopecia over face, muzzle, ears, around eyes, flanks, thighs, perineal, udder, teat, vulva, tail head (Figure 1), and inguinal regions. The region below hocks was moist, matty and covered

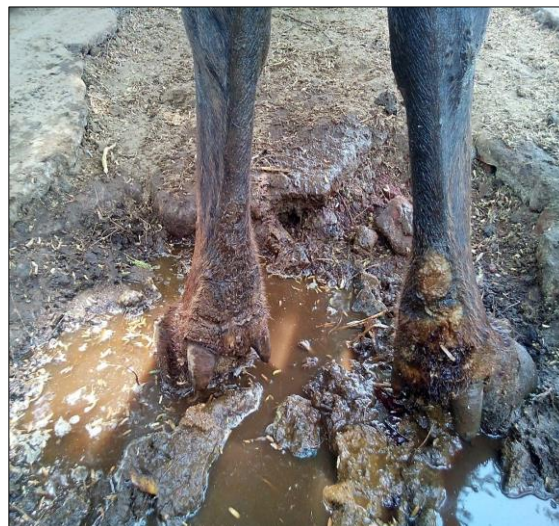
with scabby scales (Figure 3). The coronet region was swollen with cracks (Figure 4). Frothy salivation was observed without any signs of stomatitis. The vital parameters temperature like pulse and respiration were within the normal range in all the animals.



**Fig 1:** Before Treatment - Observe Lesions at Head, Vulva, Perineum, Tail Head, Udder, Teats and Legs.



**Fig 2:** Before Treatment - Observe Lesions on Head, Around Eyes, Ears, Flank, Legs, Udder and Teats.



**Fig 3:** Before Treatment – Thick Crusts Areas of Alopecia on the Face, Legs.



**Fig 4:** Swelling and Cracks at Coronet Region.



**Fig 5:** After Treatment – Observe Clear Healing on Face, Legs and Vulva.





**Fig 6:** After Treatment – Observe Clear Healing on Face, Legs, Udder and Teats.

Examination of skin scrapings and blood sample were negative for external and blood parasites respectively. Dung samples examined were found positive for *Balantidium coli* trophozoites. Based on the history and clinical observations, the condition was tentatively diagnosed as dermatitis due to zinc deficiency (parakeratosis). (Figure 5, 6)

### Treatment and Discussion

All the animals were:

- (i) Dewormed with broad spectrum anthelmintic, Rafoxanide and Levamisole, @ 7.5mg/ kg BW (Rafanide – L, Doctor’s Pharma).
- (ii) Orally administered with 3.5g of Zinc sulphate and 5g of Copper sulphate daily for 10 days.
- (iii) Intra muscular injections of Vitamin A, D<sub>3</sub>, E 10 ml (Vetade, Sarabhai Zydus), B complex 10 ml (Tribivet, Intas pharma) and Ampicillin + Cloxacillin @ 10mg/kg BW (AC Vet forte, Intas pharma).
- (iv) Topical application of Zinc oxide + tincture iodine / Neem oil paste.
- (v) Advised the owner to provide Raagi gruel to animals.
- (vi) Maintained in dry floor conditions. Oral and topical medication for 10–15 days and injections for five days were followed. Complete resolution of the skin lesions was observed in all cases within a span of 7–10 days.

In the present cases the lesions might be due to continuous feeding of zinc deficient groundnut hay, paddy straw from zinc deficient soils and improper or non supply of mineral mixture [4].

Zinc sulphate was administered orally for rapid recovery from deficiency as a total dose of 2–4 g can be given in large animals [4]. Zinc oxide topically applied as it was proved to be enhancing epithelialization and granulation tissue formation in cutaneous wounds [7].

Tincture iodine was used as an antiseptic and as a base for zinc oxide. Neem oil was used in some cases as it also enhances wound healing, acts as fly repellent and a base [8]. Vitamins A, D and E were injected for faster epithelialization. Raagi (Red millet/ finger millet) gruel was advised as a supportive therapy which helped in speedy recovery as it is rich in calcium, iron, zinc and potassium [9]. These skin infections may be in conjunction with other mineral deficiencies of copper, etc hence advised the owner to supplement daily with 50g mineral mixture which contains copper, zinc and other macro and micro nutrients (Agrimin forte, Virbac Animal Health).

### CONCLUSION

Zinc responsive dermatitis in buffaloes could be due to zinc deficiency caused by different factors and can be successfully treated by zinc sulphate, mineral mixture and other supportive therapy.

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