

Effect of Oral Supplementation of Vitamin 'A' On Minerals Profile of Sheep Hair

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Abstract

To find out the influence of oral supplementation of vitamin A on minerals of sheep hair, six Barbari sheep selected randomly from the herd on the basis of various phenotypic traits and offered identical feed to meet out their daily nutritional requirements. The animals were given oral administration of vitamin A at the rate of 5000 IU per kg live weight in the morning daily. Hair were sampled from the neck shoulder, mid flank, ventral abdomen, croup and lateral thigh region on the days 00, 30, 60 and 90 of the experimental trial. The collected samples were subjected to estimation of major (calcium, phosphorous, magnesium) and traces (sodium, cobalt, copper, iron, nickel and zinc) elements using standard techniques. Major findings included that iron, phosphorous and magnesium contents were increased whereas calcium, sodium, cobalt, copper and nickel in sheep hair remained unchanged when vitamin A was supplemented to the sheep orally at the rate of 5000 IU per kg live weight.

KEYWORDS: Calcium Oxolate, Minerals, Selenium, Sheep hair, Vitamin A

Introduction

Domestic sheep (*ovis aries*) are quadrupedal ruminant mammals typically kept as livestock. Sheep are most likely descended from the wild mouflon of Europe and Asia. One of the earliest animals to be domesticated for agricultural purposes, sheep are raised for fleeces, meat and milk. A sheep's wool is the most widely used animal fiber and is usually harvested by shearing. So great consideration is now been given to the health and nutritional needs of livestock. It has frequently been experienced that one finds sheep with various health problems. It so very often transpires that some of these problems can be ameliorated by adequate nutrition while need medication. It is in the light of such findings that the current study was initiated. It was designed in such a way that the outcome would be useful to both the owners of the animals and the health care providers, the veterinarians and nutritionists, basic and applied scientists and even the government policy makers. Vitamin A, an oxidant terminate chain reactions produce in the body that damage cells. Early signs of Vitamin A deficiency are night blindness, loss of appetite, rough hair coat, slowed gains and reduced feed efficiency (Sewell, 1993). One of the first easily detected signs of Vitamin A deficiency in cattle is night blindness. An easy way to check for this condition is to place an obstacle in the pathway of cattle and notice if they stumble over it at twilight. Other early signs are loss of appetite, rough hair coat, dull eyes etc. Diarrhea and Pneumonia may be the first indicators, especially in young animals. Later development include excessive watering of the eyes, staggering gait, lameness or stiffness in knee and hock joints, and swelling of legs and brisket (and sometimes in the abdominal region). Selenium is involved in antioxidant activity and therefore, can be considered synergistic to vitamin A.

Both vitamin A and selenium have similar effects upon inhibiting carcinogenesis (Clement, 1987). Other minerals synergistic to vitamin A include magnesium, manganese, potassium and phosphorous. Like vitamin A, these minerals are closely related to thyroid function.

Present investigation was an effort to make attempts to find out the influence of administration of vitamin A on the mineral profile of sheep hair.

Materials and Methods

The study was carried out on six Marwari sheep selected randomly from the herd on the basis of various phenotypic traits (Age 230.83 ± 5.0 d; weight 23.08 ± 0.48 kg ; height 72.50 ± 2.50 mm; length 69.50 ± 2.50 mm). Ratio of 1:1 was maintained between males and females during selection of subjects.

The subjected animals were reared at the door of the farmer in village Chaumuhan of Mathura district of UP and were offered identical feed as per the specification of ICAR (1998) to meet out their daily nutritional requirements. The steps were taken for

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deworming under prescription and supervision of veterinarian to make sure that the animal will remain free from internal and external parasitic infection during the investigation. The animals were given oral administration of vitamin A at the rate of 5000 IU per kg live weight in the the morning daily. Samples of hair were collected from the neck, shoulder, mid flank, ventral abdomen, croup and lateral thigh region on the 00, 30, 60 and 90 of the experimental trial. The collected samples were subjected to estimation. The trace minerals in hair samples were analyzed by atomic absorption spectrometer. Calcium was determined with the help of Calcium Oxalate method (AOAC, 1992). Mg was determined calorimetrically after removing calcium as calcium sulphate precipitate using the reagent eriochrome T, Phosphorous by calorimetric method and magnesium by magnesium ammonium phosphate precipitation method, trace elements (sodium, cobalt, copper, iron, zinc and nickel) using standard techniques. Collected data were analyzed statistically using standard techniques (Snedecor and Cochran 1994) to draw valid conclusion.

Results & Discussion

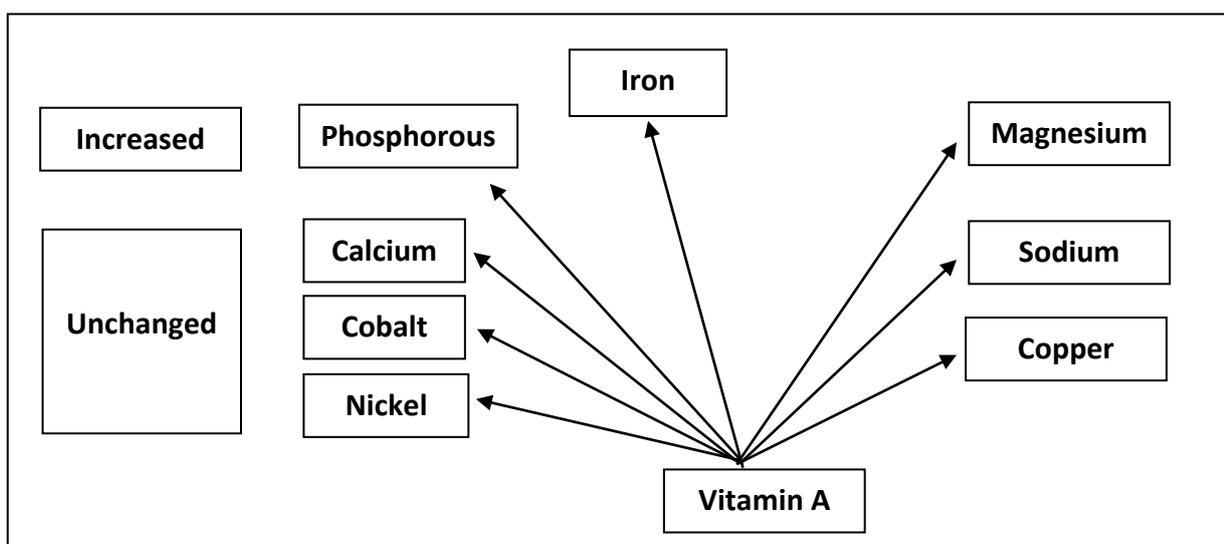
On the basis of findings of the present investigation (Table 1 and fig 1 & 2) it concludes that phosphorous and magnesium contents of hair were increased due to oral supplementation of vitamin A in sheep. The increment of these elements in sheep hair due to oral supplementation of vitamin A was not so high and remained only upto 3.6 and 2.3% respectively. The increment in iron content of sheep hair due to oral supplementation of vitamin A was found outstanding and recorded upto 15%. Vitamin A in synergistic with iron because of its antioxidant property (Watts, 1991) and caused enhancement of iron content of hair in sheep.

The content of calcium, sodium, cobalt, copper and nickel I sheep hair remain unchanged after oral supplementation of vitamin A.

Table 1: Mineral profile of sheep hair (mg/kg)

Component	Unit	00 days	30 days	60 days	90 days
Calcium	mg/kg	776.00 ± 17.50	776.50 ± 19.70	775.40 ± 18.00	775.70 ± 18.50
Phosphorous	mg/kg	385.08 ± 01.01	391.40 ± 1.80	397.00 ± 1.00	399.50 ± 0.40
Magnesium	mg/kg	397.70 ± 2.50	397.90 ± 3.00	401.50 ± 2.50	407.80 ± 2.80
Sodium	mg/kg	82.00 ± 2.50	81.80 ± 2.00	79.80 ± 3.50	78.90 ± 1.00
Cobalt	mg/kg	10.80 ± 0.06	10.85 ± 0.08	10.80 ± 0.8	10.82 ± 0.08
Copper	mg/kg	182.00 ± 1.50	185.80 ± 6.20	184.00 ± 2.00	184.20 ± 1.70
Iron	mg/kg	69.00 ± 1.80	70.50 ± 1.50	76.50 ± 1.50	82.70 ± 0.80
Nickel	mg/kg	27.50 ± 1.40	26.50 ± 2.00	29.30 ± 0.90	27.70 ± 2.20

Fig 1: Effect of vitamin A supplementation on mineral profile of sheep hair



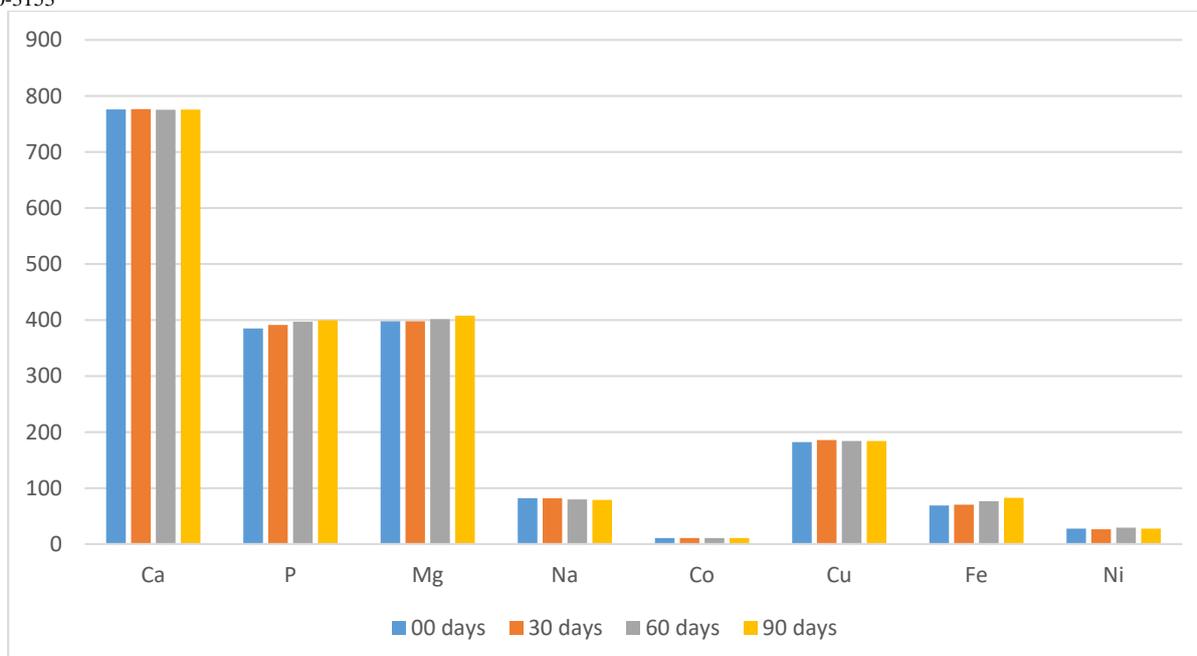


Figure 2

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