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Hair Plucking and Alopecia in a Flock of Sheep in Zaria, Nigeria

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ABSTRACT

This is a case report of hair plucking and alopecia in a flock of sheep in Zaria. Appearance of alopecia and hair pulling was noticed in an institutional sheep farm consisting of Balami, Uda and Yankasa breeds aged between 3-48 months. This was noticed over a period of 1 month in a total of 15 animals consisting of 9 ewes and 6 rams. Physical observations revealed alopecia. Blood samples and skin scrapings of the animals were negative for haemo- and ectoparasites, and faecal sample examinations were also negative. The feed analysis confirmed the correct nutrient requirement were compounded, but the feed consistency was observed to be too fine. Hay and/or pasture was not provided as required by the animals, hence, nutritional deficit was suspected. The finely ground feed was replaced with a coarse form and hay supplied *ad libitum*. The problem abated and the bare skin patches returned to normal in 4 weeks after the diet was adjusted. Feeding of these species of animals concentrates diets of fine particle and inadequate forage or hay could have negative effects on animal health and performance.

Keywords: Alopecia; Concentrate; Feed; Hair plucking; Nutrition; Sheep.

INTRODUCTION

Hair pulling is not a normal behaviour, yet it is not uncommon in a variety of animals kept in research facilities (Chiezey, 2010). It shows striking similarities with trichotillomania in humans: the hair is not only pulled but also ingested. Hair-pulling behaviour is associated with distress, can be both self-directed and partner-directed, contains elements of aggression (inflicting pain) in the social context, manifests more often in females than in males and resists treatment (Reinhardt, 2005). Hair pulling behavior in sheep has been linked to lice or mange infestation (Anderson and Rings, 2009), confining sheep in an artificial environment (Reinhardt, 2005) and deficiencies in trace elements like copper, zinc cobalt, calcium, phosphorus, sodium chloride, manganese, as well as vitamin or a protein deficiency (Meyer and Lohse, 2002). This behaviour is a vice due to boredom and is often difficult to specifically diagnose (Chiezey, 2010). There are usually no health problems which are associated with this problem in adult sheep, but the habit may have serious health consequences for lambs (Chiezey, 2010). But reports by Ravi *et al.* (2014) stated that trichobezoar, which is a concretion form of hairs found in the gastrointestinal tract of animals, could result from frequent ingestion of hair as a result of wool plucking. This behaviour in animals could be prevented by correction of husbandry deficiencies that may cause stress and also nutritional imbalance (Chiezey, 2010). This paper reports a

case of hair plucking and alopecia in a flock of sheep maintained under semi-intensive system of management.

CASE HISTORY AND CLINICAL FINDINGS

Observation of progressive loss of hair was made in a flock of 350 sheep comprising of Uda, Balami and Yankasa breeds, aged between 3 months to 4 years old, kept in Small Ruminant Research farm of National Animal Production Research Institute, Shika, Zaria. This was noticed over a period of 1 month in a total of 15 animals consisting of 9 ewes and 6 rams. History revealed they were fed 12% crude protein concentrate as shown in Table 1. History further revealed that the animals were not fed optimally as forage wasn't provided enough, being in dry season. On observation of the concentrate, it was found to be too fine in consistency.

Clinical Signs

The case of alopecia due to the fur eating was observed in 15 animals of both sexes, young and adult animals. The exposed skin was in good condition with no evidence of injuries, itching or flaking. Animals were noticed biting off the hair from other sheep and occasionally their own bodies. Most of the biting occurred over the hip, shoulder and abdominal regions, as shown in Figure 1 below.

Sample Collection and Analysis

Liquid paraffin was applied to the affected skin surface of individual animal, to help prevent the sample that is collected from dropping off the blade. A sharp razor blade was then used to scrape the skin until there is a slight capillary ooze. This was collected in to a sample bottle, properly labelled and taken to the laboratory for ectoparasite detection. 2 mLs of blood were collected via jugular venepuncture from the 15 animals into heparinised test-tubes and taken to the laboratory for packed cell volume and blood parasite evaluation. Faecal samples were collected from the rectum of individual animals for helminth screening. The samples were collected in a nylon bag, labelled and taken to the laboratory for examination. The faecal samples were examined for the presence of helminth eggs and coccidian oocysts. Finally, proximate analysis of the concentrate feed sample was also carried out.

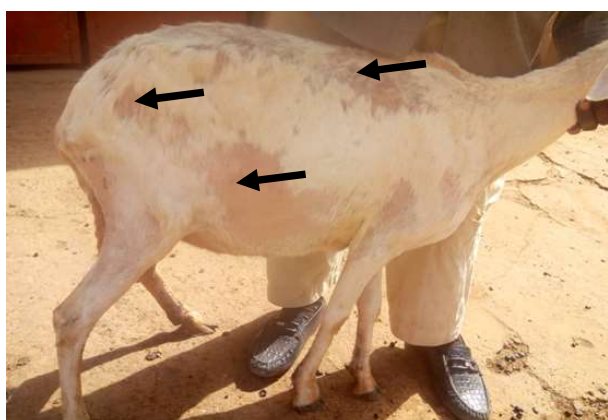


Figure 1: Photograph of an ewe showing alopecia on the dorsal, abdominal, rump and scapular regions (Black arrows).

RESULTS AND MANAGEMENT

Physical examination did not reveal any ectoparasites and likewise the skin scrapings. No helminth ova were found in the faecal analysis, but few coccidian oocysts (+) were detected in fewer animals. Blood samples showed that PCV ranged from 24- 35% with no haemoparasites detected (Table 2). The feed analysis result revealed the feed meets the requirement for this species of animals (Table 1). Physical examination of the feed showed that the feed texture was very fine. Having no pathologic diagnosis of this condition, the condition was tentatively diagnosed as a nutritional problem and also due to the absence of roughage in the diet. Female animals were more involved in this habit than the males.

Table 1: Percentage Composition of the Concentrate fed to the Sheep

Ingredients	Percentage%
Maize	31.2
Maize offal	15.6
Wheat offal	15.6
Cotton seed cake	34.6
Bone meal	2.0
Common Salt	1.0
Total	100

A new concentrate was ordered to be compounded and this time coarsely grounded so that it has larger particle size and hay was also provided *ad libitum*. The fur of the affected animals regrew after 1 month of intervention, and the act of hair pulling and eating ceased.

Table 2: PCV and Coccidian Oocysts in a flock of Sheep

Animals	PCV %	Oocyst
1	27	+
2	29	Nil
3	24	+
4	28	Nil
5	30	Nil
6	35	Nil
7	32	Nil
8	32	Nil
9	27	Nil
10	29	Nil
11	25	+
12	31	Nil
13	32	Nil
14	29	Nil
15	30	Nil

DISCUSSION

A report by Reinhardt, (2005) stated that females show wool pulling significantly more often than males in a group of Muskox. This is similar to what was experienced in this case although no statistical test was done. This situation abated after the change in feed consistency and provision of hay *ad libitum*. This is similar to what was reported by Chiezey *et al.*, 2010 in rams confined for experimental purposes. Similar incidences of hair loss were reported in Merino sheep fed a drought ration of wheat with small particle size (Stafford, 1988) and in sheep which had a deficiency of roughage in the diet (Fraser and Broom, 1990). Stafford (1988) had reported that diets of small particle size did not stimulate rumination and so the sheep may pseudo-ruminate. They may regurgitate a bolus of forestomach contents, but the bolus material may be too fluid to evoke a bout of cud chewing. Stafford (1988) proposed that sheep acquired the vice because the time that sheep would normally spend ruminating, which is about 6-12 hours per day, will be spent idling. This theory explains what was observed in the animals investigated in this report. Hair plucking and ingestion *per se* may not be of great consequence in adult animals, but the lamb's system may not be able to handle the hair mats (William *et al.*, 2000). Chiezey *et al.* (2010) further reaffirms that hairballs (trichobezoars) may form in the stomach, causing obstructions of the reticulo-omasal orifice. Particle size of ground grains for ruminants should be an optimal geometric mean diameter (GMD) of 1150 to 1250 microns as compared to a GMD between 400 and 600 microns for poultry and pigs (Hutjens, 2002).

It is difficult to say whether hair pulling is also a mental disorder in animals, but it is reasonable to assume that affected subjects experience similar psychogenic disturbances as humans do, namely boredom and/or anxiety and/or depression. The Institute for Laboratory Animal

Research categorizes hair pulling in animals as a maladaptive behaviour that relieves the intensity of distress resulting from the chronic exposure to environmental stress (Federation of European Laboratory Animal Science Associations, 2005).

This condition of hair pulling and eating could be fatal in this group of animals, hence necessary to forestall its occurrence. This can be prevented by feeding sheep coarse concentrate to allow for optimal rumination. Hay forage should also be provided *ad libitum* for this group of animals to augment their fibre requirements. Also, mineral salt lick is highly recommended in order to abolish any deficiency of trace elements in their rations.

Conflict of Interest

The authors declare that they do not have any conflict of interest.

Author's Contribution

TKB, MH, BBO, RH and BEO were responsible for the sample collections, monitoring and evaluation, write-up and proof reading. SYI was responsible for sample collections and analyses of blood samples

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