استخدام الصوف لتشخيص بعض الحالات المرضية

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استهدفت هذه الدراسة تعيين مستوى بعض العناصر النادرة فى مصل الدم وصوف الأغنام السليمة اكلينيكيا والمصابة ببعض أمراض نقص العناصر النادرة وقد أعطت هذه الدراسة بعض النتائج المشجعة فى استخدام الصوف كوسيلة لتشخيص أمراض بعض العناصر النادرة فى الأغنام .

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WOOL AS AS EFFECTIVE TOOL FOR DIAGNOSIS OF SOME DEFICIENCY DISEASES

(With 3 Tables)

By

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SUMMARY

A study was carried out to detect the alterations in some trace elements which may be accompanied with some diseased conditions in sheep by analysis of their woool and sera. Such diseased conditions were alopecia, anorexia, licking soil and Infertility. The results were compared with those obtained from clinically healthy sheep.

The results recorded, in this work, revealed a significant decrease in the levels of all trace elements, under test, in wool samples of the different diseased conditions but a non-significant increase in zinc was only detected in infertile cases.

Analysis of serum samples revealed a significant decrease in copper and iron levels in all cases examined as well as in zinc and manganese levels in both alopecia and infertile cases. A non-significant decrease was detected in molybdenum level in case of alopecia, licking soil and infertility as well as manganese in anorexia,also zinc in licking soil cases.On the other hand, a non-significant increase was observed in molybdenum and manganese levels in sheep with anorexia and licking soil, respectively.

The good reflection of the altrations in the level of trace-elments in wool samples was considered as an effective tool, when used, to detect nutritional deficiency and or poisoning cases. Besides,wool anaylsis is more easier, unexpensive, safe and reliable.

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INTRODUCTION

Analysis of wool and hair can be used now for the detection of some nutritional defciencies or poisoning. Coat and skin affections in domestic ruminants seemed to be influenced by dietary intake of some important trace elements. In this respect, MILLER et al. (1965-1966) demonstrated that zinc content of hair in goats and cattle could be considered as a diagnostic guide of zinc intake. MILLER et al. (1964) reported a rough hair coat with even loss of hair in zinc deficient goats. In lambs, OTT et al. (1964) reproted additional signs where anorexia, depraved appetite and reduced growth were prominant. More recent, work was determined in Egypt by ABDEL-AZIZ (1979) where the author reproted the levels of zinc in wool of normal and deficient lambs.

Loss of crimp and failure of pigmentation of wool were observed in copper deficiency in sheep by LEE (1950), and KIKKAWA et al. (1955). Serum cupper levels in native sheep either healthy or capper deficient were determined by FAWZIA (1971).

The relation between serum molybodenum, iron, manganese and the diet was discussed by HAWKINS et al. (1955). Moreover, molybdenosis induced a rough coat (SMITH and JONES, 1966).

As sheep may fall under the influence of some environmental and dietary abnromal conditions in many areas of the republic, it encourages us to carry on this preliminary investigation in a trial to demonstrate the importance of the comparative distribution of these elements in wool and serum. This may be a trial for a further diagnostic aid for some nutritional disorders.

MATERIALS AND METHODS

Blood and wool samples were collected from ten clinically healthy sheep and from 25 sheep suffered from different diseased conditions including Alopecia (12), Anorexia (5), Licking soil (4) and history of

infertility (4). These animals were admitted to the clinic of Fac. Vet. Med., Zagazig University and proved to be parasitic free. The gained serum and wool were subjected, after preparation, to the determination of their concentration of zinc, copper, iron, molybdenum and manganese levels.

Zinc and manganese were estimated using PYE Unicum atomic absorption spectrophotometer (MODEL SP 1900), while copper, iron and molybdenum were determined according to methods of GUBLER et al. (1952) , SERIFER-KIT , BIOMERIEX and SANDEL (1944), respectively.

RESULTS AND DISCUSSION

TABLE (1)

Mean levels of trace elements in sera of clinically healthy and diseases sheep.

Elements	Normal	Diseased conditiions			
		Alopecia	Anorexia $	Licking soil	Infer-tility
		ug / 100 ml. serum			
Zinc	62.20 ± 0.08	33.00 ± 1.22**	52.20 ± 3.58**	54.00 ± 5.72	48.75 ±4.15**
Iron	148.40 ± 3.74	82.55 ± 3.85**	106.00 ± 7.48**	72.75 ± 3.04**	98.75 ±7.74**
Copper	130.40 ± 3.71	93.18 ± 2.21**	90.00 ± 4.47**	58.75 ± 4.27**	83.00 ±1.29**
Molybdenum	5.00 ± 0.39	3.36 ± 0.53	6.20 ± 0.49	3.5 ± 0.96	2.25 ±0.57
Manganese	40.00 ± 0.6	10.55 ± 0.21**	30.20 ± 0.68	40.50 ± 0.65	10.25 ±0.25*

*=Significant **=Highly significant $=Accompanied by eating wool

Mean levels of trace elements in wool of clinically healthy and diseased sheep.

Elements	Normal	Diseased conditions			
		Alopecia	Anroexia$	Licking soil	Infer-tility
			ppm		
Zinc	394.40 ± 4.33	306.36 ± 5.92**	362.00 ±10.20**	330.00 ±19.15**	407.00 ± 4.79
Iron	175.20 ± 3.83	83.82 ± 5.56**	117.60 ± 1.91**	93.75 ± 3.57**	88.25 ± 3.84**
Copper	93.70 ± 0.76	18.50 ± 0.67**	16.20 ± 1.36**	17.50 ± 0.96**	24.00 ± 2.16**
Molybdenum	16.50 ± 1.16	7.73 ± 0.45**	10.40 ± 0.75**	11.00 ± 1.29*	7.00 ± 0.58**
Manganese	100.80 ± 0.61	40.80 ± 0.63**	70.20 ± 0.37**	70.25 ± 0.48**	30.25 ± 0.48**

*=Significant **=Highly significant $=Accompanied by eating wool

Table (3):

Decrease percent of some trace elements in sera and wool of sheep with different diseased conditions.

Elements	Diseased conditions							
	Alopecia		Anorexia		Licking soil		Infertility	
	Serum	Wool	Serum	Wool	Serum	Woll	Serum	Woll
Zinc	47.09	22.32	16.08	8.21	14.14	16.32	21.60	33.19$
Iron	44.37	52.15	28.57	32.87	50.97	46.48	33.45	49.65
Copper	51.21	57.95	40.00	63.18	60.83	60.22	44.66	45.45
Molybdenum	32.80	53.15	24.00	36.96	30.00	33.33	55.00	57.57
Manganese	73.62	59.52	24.50	30.35	1.25$	30.30	74.75	69.99

 $= Exceptionally increase.

The obtained results indicated that the distribution of zinc, molybdenum and manganese, in wool and serum of the clinically healthy individuals; was not the same. Wool posses higher concentration of these elements than the respective values of serum, while serum copper level was higher than that of wool in the same group. (Table 1 & 2).

The results obtained and recorded in Tables 1,2 & 3 revealed that there were significant decrease in iron and copper levels in both serum and wool of all sheep with different diseased conditions. Regarding molybdenum and manganese, the reduction was detected only in wool of all diseased sheep.

Zinc level was significantly decreased in both serum and wool of sheep with alopecia and anorexia but only in wool and in serum of licking soil and infertile sheep, respectively.

Serum manganese showed altration in its levels where a significant decrease was observed in cases of alopecia and infertility.

The detected alterations in the concentration of the various trace elements found in the sera of diseased sheep pointed out that it was a good indication for the diagnosis of nutritional disorders, perhaps more sensitive than the serum analysis.

Thus, it may be recomended therefore that periodical testing of the important trace elements, status in sheep, through analysis of their wool could be applied.

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