Health hazards in sheep rearing on polluted grass and water in some Assiut governorate localities
1- Clinical, Haematological and Heavy Metals Level
2- Clinical, Proteingram Picture and Level of Heavy Metals

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Abstract
A total number of 341 ewes aged from 3-5 years old, were used in this study. These animals were divided into 8 groups after the clinical examination and according to source of pollution, localities. Samples were taken from water sources, feedstuff and blood samples were collected from each sheep raring around Localities of pollution. Our study revealed highly significant ($p < 0.01$) level of heavy metals (lead, cadmium& fluorine) in water either from small canal and surface water and examined feed stuffs Highly significant ($P <0.01$) elevation in the level of heavy metals including lead, cadmi urn and fluorine were found in sera of sheep . The most important clinical signs of examined sheep were general signs and specific signs which differed according to the poisoning metal. Blood Picture revealed oligocythemia, leucopenia and decrease in the haemoglobin content and packed cell volume in blood of sheep grazing and drinking . Differential leucocytic count of blood smear revealed, lymphopenia, neutropenia, and monocytosis associated with eosinophilia in affected sheep. Highly significant ($P<0.01$) elevation of heavy metals (lead, cadmium and fluorine) from both small canal and surface water and in examined feedstuff samples were recorded . The same phenomena were observed in the level of heavy metals (lead, cadmium and fluorine) in blood serum of tested sheep. The most important clinical signs of examined sheep included general signs of emaciation, anorexia, pale mucous membrane, dryness and roughness of wool and foul foetid diarrhea in some sheep. Specific signs as clinical signs of flourosis appeared depending upon the poisoning metal. There was highly significant ($P<0.01$) decrease in total protein, albumin and globulin in blood serum of all sheep rearing and grazing on polluted grasses and water when compared with the control group. The electrophoresis pattern revealed highly significant decrease in protein fraction especially a_1,a_2,B and gamma globulin in all tested sheep Highly significant decrease in vitamin C (Ascorbic acid mg%) was recorded in blood of all tasted sheep .

Key words: *lymphopenia, monocytosis , lead, cadmium and fluorine.*

Introduction

Khalaf- Allah and Abd E1-Aal (1999) declared significant decrease in total serum protein as well as albumin and globulins in sheep exposed to lead pollution, and chronic cadmium poisoning **Tatari *et al* (2001)** mentioned that cadmium and lead decrease total serum protein by inhibition protein synthesis. Albumin and A/G ratio, while globulin showed a slight increase in serum of sheep were drank from water polluted with sewage water. **Ahmed (2004)** Stated that biochemical . analysis of serum proteins of lead, cadmium and fluorine exposed sheep showed significant hyporoteimenia, hyoalbuminania , hypogiobunaemia and in significant change in A/o ratio. In sheep, pollution is more likely to occur in grazing near smelters or main high ways, where pasture and surface water is contaminated by exhaust fumes of automobiles. Sheep are usually affected by eating forage such as rubbish dumps. lead contaminated feed with engine sump oil, crankcase oil, automobile oil filters, lead bearing paints and discarded lead

batteries are the more common source of pollution. **Radostits *et al*, (2000)** .The increase of pollution, comes from industrialization and agricultural activities results in more and more wastes entering the River Nile. Portable water are difficult attained, for this still drainge canals especially irrigation ones are the sour water in our villages **Raghib *et al* (2003)**
Environmental pollution in industrial localities is considered to be one of the most important problem threats all forms of life The heamatological system are very sensitive to the effect of pollution **(WHO, 1997).** The water of River Nile which is the source of life of Egypt is polluted with heavy metals above the permissible limits. Water pollution with heavy metals is one of the most deleterious agent to the biological life (**Abd El-Nasser *et al*., 1996; Larkin, 1998** and **Crompton, 1998).**

In Assiut Governorate there are many sources of pollution. The presence of industrial discharge from superphosphate, cement, and petrolleum manifactures , in addition to pollution of the surface water which lies near the high way, Also there are additional sources include sewage effluent and waste water from tanneries at El Madabegh. Beside the use of sewage sludge on agricultural land which contain heavy metals mostly lead and cadmium. The previous studies in Assiut governorate, revealed a high level of lead in all examined water sources, plants and in milk of rearing sheep near roads, This study was oriented to investigate the effect of heavy metals on animal heath and thrawlight on their influence on haemograrn picture and biochemical alteration through their effect on immune status.
Therefore the aim of the present study to throw a light on the proteinogram picture including total protein albumin, globulin and protein electrophoresis and determination of Vit. C concentration in blood serum of examined sheep reared a grazed on polluted grasses and water .

Materials and Methods
Animals.

A total number of 341 balady sheep, their ages ranged from 3-5 years were chosen in this study .Fifty one (51) of them had been chosen from privet farm at El Matmer - Sahel Salem and were subjected to both careful clinical and laboratory methods of examination to ensure their healthy status and used as control of this study. The reminder sheep (ewes) (290) were rearing and grazing at the expected environmental in polluted.areas. Diseased sheep were subdivided according to localities and source of pollution (Table 1).
All sheep were subjected to careful clinical examination and recording all clinical observation according to Martin and Aitkn, **(2000)**. All sheeps were under strict program of internal and external parasitic control and vaccinated against viral diseases according to the regulation of veterinary authorities.

Samples .
Two blood samples were collected from each animal through jugular vein puncture.Frist portion with using anticoagulant (EDTA-lmg/ml) for haematological parmeters indices according to **(Coles 1986)**. Second portion without anticoagulant .The for sera separate for examination were examined biochemical parmeters and levels of heavy metals and protein profile .
Feed stuffs and drinking water (surface and tape water) were collected and used for determination of heavy metals including lead, and cadmium using atomic absorption spectrophotomecter GBC 906 Atomic absorption L.A OF 3000 while the fluorine levels were .deterrnincd according to the method of **Fry and Taves (1970).**
Blood serum total protein values were estimated using test kits .
after Albumin values **(Webster, 1974)** and serums protein electrophoresis by using cellulose acetate plate .

Results
Chemical analysis of examined water, feed stuff and blood sera for heavy metal including lead, cadmium and fluorine levels were illustrated in tables 2,3,& 4 The analysis of water

from different sites of the studied areas for heavy metals indicated increased in the levels of Lead (Pb), Cadmium (Cd) and Flourine (F), from all localities revealed a highly significant increase (P<0.0l) than the compared with control .

The most important clinical signs of the investigated sheep in the different localities can be summarized in general signs Include anorexia, dullness, weakness unthrifty, pale mucous membranes, rough coat. Examination of sheep; showed ruminal stasis, constipation in some sheep and fetid diarrhea dark, foul smelling in most cases with abdominal, pain, decrease in body weigh, .

Haemogram picture of examined sheep reveled oligocythaemia, leucopenia and decrease in the haemoglubin content and P.C.V % in diseased sheep if compared with control group (Table 5&6) examined sheep reveled lymphopenia, neutropenia, monocytosis in affected sheep rearing and graizing around contaminated area if compared with control group.

As declared in table 7 mean values of blood serum total protein in samples of tested sheep revealed hypoproteinemia, hypoalbminaemia and hypoglobunaemia when compared with control one .

Table (8) showed the mean serum protein electrophoresis fractions globulins (a, B and gama) of control and affected sheep . These results revealed a highly significant drop (P<0.0l) in globulins (globulinaemia) in all sheep group grazing in polluted localities when compared with control one.

The obtained data as shown in table 9 showed that the mean value (mg %) of Ascorpic acid in sheep grazed in polluted area was significantly decreased when compared with control group .

Table (1). Localities and source of pollution.

Areas	Animal No	Source of pollution
Arab El- madabegh	52	Sewage razing station (the main plant of sewage waste waters resides)
Gabdam	26	Sewage canal, cement factory and petroleum factory
Gaz El Akrad	69	Super phosphate factory
Mangabad	33	Super phosphate factory
Bani Ghalib	31	Factory of plastic and electroplating (industrial area)
El walidiya	39	Motor boat traffic in river Nile and electrical station Motor vehicle Rabish dumps
Vest Assiut (El shader)	40	Motor vehicle Rabish dumps
I Arab El-Matnier	51	Fara way from pollution

Table (2). Levels of heavy metals in water (ppm) in different Localities :

Localities	Source of water	Lead ppm	Cadmium (ppm)	Fluorine ppm
Arab El-Madabegh	Small Canal	2.157 ± 0.42*	0.348 ± 0.003	2.4 ± 0.02
	Surface water	1.484 ± 0.13	0.296 ± 0.001	3.06 ± 0.21
G. El Akrad	Small Canal	0.438 ± 0.006*	0.114 ± 0.0011	3.7 ± 0.013
	Surface water	0.391 ± 0.05	0.157 ± 0.0006	4.36 ±0
Manquabad	Small Canal	0.511 ± 0.1*	0.107 ± 0.001	3.4±0.11
	Surface water	0.618 ± 0.004	0.169 ± 0.0002	4.08±0.081
El-walidya	Small Canal	0.783± 0.016*	0.092 ± 0.0001	2.08±0.03
	Surface water	0.433 ± 0.012	0.076 ± 0.0004	2.1±0.016
Baiti Glialib	Small Canal	0.665 ± 0.03*	0.218 ± 0:0003	2.08 ± 0.004
	Surface water	0.613 ± 0.1	‘0.25 ± 0.0007	2.1 ± 0.016
Gahdam	Small Canal	1.423±0.2*	0.3±0.0005	2.21 ± 0.05
	Su, face water	1.2745±.03	0.232±0.0006	3.26 ± 0.04
El Shader	Small Canal	1.035±0.006*	0.228±0.0005	1.3 ± 006
	Sui face ate	1.291±0.002	0.272±0.0005	1.43 ± 0.009
Control	Tape Canal	0.0134±0.0005	0.0055±0.0001	2.204 ± 0.001
	Surface water	0.0602±0.0003	0.016±0.0002	0.28 ± 0.04

N.S : non significant * : significant (P < 0.05)
** : Highly significant (P <0.01)

Table (3). Levels of heavy metals in grass (ppm) in different localities.

Localities	Source of feed	Lead	Cadmium	fluorine
Arab El - Madabegh	Bar seem Grass	7.43±1. 8.8 + 0.75	2.8 ± 0.4 3.6 ± 0.23	6.42 ± 0.4 4.35 ± 0.7
Bani Ghalib	Bar seem Grass	2.0 ± 0.44 5.8 ± 0.8	1.63 ± 0.08 1.38 ± 0.11	7.31 ± 0.92 5.9 ± 0.7
El Shader	Bar seem Grass	9.8± 1.32 9.9 ± 0.8	3.5±0.015 3.3±0.007	0.91 ± 0.08 1.06 ± 0.002
El-walidya	Bar seem Grass	1.2± 0.08 1.8±0.35	0.46±0.005 0.41±0.0061	1.3 ± 0.01 1.23 ± 0.16
G. ElAkrad	Bar seem Grass	2.54 ± 0.43 3.6±0.6	0.61±0.042 0.817 ±0.003	14.81 ± 0.19 12.32 ± 0.67
Manquabad	Bar seem Grass	1.86 ± 0.3 1.1 ± 0.02	0.53±0.003 0.713 ± 0.002	11.63±0.83 13.24 ± 0.95
Gahdam	Bar seem Grass	5.31 ±0.83 7.1 + 0.5	2.01 ± 0.003 3.1 ± 0.04	5.21±0.43 3.86 ± 0.33
Control	Bar seem Grass	0.0.56± 0.03 0.326±0.17	0.012 ± 0.002 0.04 ± 0.001	0.53 ± 0.006 0.78 ± 0.03

Table (4). Mean values + standard deviation levels of blood serum lead ppm , cadmium ppm and fluorine ppm levels of examined sheep.

	Control	G. El Akrad	Manqubad	Bani Ghalib	Arab El-Madabegh	El Shader	El-walidya	Gahdam
Lead	0.01± 0.0018	0.15± 0.035**	0.14± 0.057**	0.25 ± 0.053**	0.65± 0.12**	0.64± 0.11**	0.34± 0.045**	0.44± 0.082**
Cadmium	0.034± 0 .005	0.12 ± 0.006**	0.12± 0.004**	0.16± 0.006**	0.17± 0.006**	0.23± 0.007**	0.10 ± 0.007**	0.16± 0.006**
Fluorine	0.098± 0.045	0.62 ± 0.11**	0.40± 0.05**	0.34± 0.038**	0.33 ± 0.047**	0.13± 0.065*	0.16± 0.095**	0.30± 0.06**

Table (5). Total erythroctyic , Hemoglobine concentration , packed cell volume and erythrocytic indices of examined sheep.

Items	Total RBC Count $x10^6/mm^3$	Hemoglobin Concentration (g/l)	PCV (%)	MCV (%)
Arab El-Madabegh	4.84 ± 1.49** 4.00-9.50	59.09±14.83** 40.0- 100.0	23.51±2,32** 21.0-33.0	42.55±I0.l0** 29.41-59.61
Gaz. El Akrad	5.92 ± 1.52** 4.2 - 11.5	63.35±13.76** 50.0-100.0	23.56 ± 2.59** 21.0 - 35.0	41.44 ± 7.92** 30.0-57.78
Manquabad	7.51 ± 1.69** 5.05- 10.12	78.18±13.51** 65.0- 110.0	29.21 ± 2.80** 24.0 -36.0	40.55±8.64** 30.59 - 62.75
Bani Ghalib	6.27± 1.72** 4.0 - 10.6	71.77±15.91** 50.0- 110.0	26.71 ± 5.59** 17.0 -36.0	43.85± 7.46** 32.14 - 62.79
El-walidya	7.48±1.19** 5.60- 10.0	78.72 ±12.05** 65.0 -110.0	29.46 ± 3.06** 25.00 ± 37.00	39.85±3.69** 32.63 – 45.16
El-shader	3.99±0.98** 3.00- 7.10	45.71 ±6.01** 40.00 -70.00	21.87 ± 2.01** 17.00 ± 30.00	56.79±10.12** 30.99 - 76.67
Gahdan	6.00±0.67** 5.00-7.40	64.81 ±5.11** 60.00 -80.00	24.19 ± 1.78** 20.00 - 31.00	40.73± 4.94** 31.08 -51.72
Control	11.50±1.19 9.7-14.11	117.49 ± 15.37 95.0- 160.0	37.87 ±2.25 31.0 -43.0	33.13 ± 3.08 28.15 --39.61

N.S: non significant *: significant (P < 0.05)
**: Highly significant (P <0.01)

Table (6). Total leucocytic x 10^3 / ul and different leucocytic count % of examined sheep.

Items	Totel WBC_S Count x $10^3/mm^3$	Neutrophils (%)	Monocytes (%)	Eosinophils (%)	Basophils (%)
Arab El - Madabegh	3.86±1.90** 2.30-6.2	30.02±2.43** 26.00-34.00	9.13 ±l.44** 5.00- 10.00	8.88 ± 1.46** 5.00-9.00	0.31±0.47 00.00-1.00
Gaz. El Akrad	3.93 ±0.82** 3.40-8.05	28.13 ±2.12** 25.00-35.00	6.78 ± 1.54** 3.00-8.00	12.95 ±0.79** 9.00-11.00	0.17±0.38 00.00-1.00
Manquabad	5.86 ±1.39** 4.0-9.80	31.87± 1.73* 30.00- 35.00	3.36± 1.34** 0.00-8.00	9.15 ± 1.62** 7.00-10.00	0.17±0.29 00.00-2.00
Bani Glialib	4.61 ±O.65** 3.75-6.50	29.96± 1.85* 27.00 - 33.00	7.93 ± 1.39** 5.00-9.00	6.48 ± 0.93** 4.00-8.00	0.58±0.67 00.00-1.00
El-walidya	5.52 ±0.92** 3.95-9,00	34.61 ± **239**^{NS} 30.00-39.00	4.48 ± 0.82** 3.00-6.00	1.92 ± 0.70 1.00-3.00	0.18±0.39 00.00-1.00
Elshader	3.34 ±0.34** 2.15-4.10	31.00 ±2.17** 27.00 -35.00	10.20 ±0.88** 7.00-11.00	7.17 ± 0.37** 4.00-8.00	0.42±0.67 00.00-2.00
Gabdain	3,99±0.50** 2.50-5.10	30.81 ±2.51** 25.00-34.00	10.69±0.78** 8.00-14.00	6.04±1.15^{NS} 3.00-7.00	0.38±0.64 00.00-2.00
Control	10,23±1.66 6.50-13.50	35.00 ±1.34 33.00-37.00	1.59±0.49 1.00-2.00	2.08±0.56 1.00-3.00	0.29±0.46 00.00-1.00

Table (7). Mean values, standard deviation level's of proteinogram picture (g/l) of examined sheep

Items	Totel Protein (g/l)	Albumin (g/l)	Globuline (g/l)	A/G ratio (%)
Arab El- Madabegh	48.19 ± 5.64**	26.35 ± 3.64**	21.84 ± 3.61**	1.23 + 0,26**
Gaz. El Akrad	52.60 6.86**	27.65 ± 3.27**	24.95 ± 4.31**	1.13 ± 0.17**
Manquabad	65.56 ± 6.68**	32.70 ± 3.29**	32.86 ± 4.2**	1.00±0.11**
Bani Ghalib	59.24 ± 8.62**	30.06 ± 3,93**	29.18 ± 6.17**	1.07 ± 0.22**
El-walidya	61.42 ± 8,55**	32.46 ± 5.02*8	28.96 ± 459*	1.13 ±0.164*
El shader	47.34 ± 5.98**	26.74 ± 3.81 **	20.61 ± 3.06**	1.31 ± 0.20**
Gahdam	53.96 ± 5.05**	28.48 ± 2,32**	25.48 ± 3.61**	0.85 0.14
Control	84.10±5.00	38.33±4.8	45.77±3.90	0.84±014

N.S: non significant *: significant ($P < 0.05$)
**: Highly significant ($P < 0.01$)

Table (8). Mean values, standard deviation, minimum, maximum of Absolute values of protein Electrophoretic picture g/l of examined sheep.

Items	Albumin (g/l)	al - globulins (g/l)	u2-globulins (g/l)	B-globulins (g/l)	g1obulins (g/l)
Arab El Madabegh	25.22 ± 2.56**	2.64 ± 0.99**	4.50 ± 0.94**	7.03 + 1.05**	3.33 + 2.16**
G.EI Akrad	25.40 ± 2.70**	2.93 ± 0.93**	5.73 ± 1.45**	6.39 ± 1.92**	4.20 ± 1.82**
Manquabad	25.17 ± 3.71**	3.42 ± 0.98**	6.63 ± 1.14**	3.91 ± 1.95**	3.75 ± 1.62**
Bani Ghalib	30.27 ± 1.94^{NS}	2.62 ± 1.62**	5.44 ± 0.79**	9.21 ± 0.72**	12.28 ± 1.07
El-wa lidya	28.60 ± 3.18*	3.20 ± 0.53**	5.08 ± 1.91**	8.02 ±1.59**	8.79 ±1.82**
El shader	26.87 ± 2.55**	3.47 ± 1.71**	5.60 ± 1.27**	7.17 ± 2.78	5.49 ± 1.93*
Gahdam	27.46 ± 4.08**	3.64 ± 1.29**	4.80 ± 1:27**	7.26 ± 339**	6.52 ± 1.55**
Control	36.28 ± 1.35	5.31 ± 1.33	8.42 ± 1.15	13.48 ± 1.46	24.28 ± 1.49

Table (9). Mean values, standard deviation and minimum and maximum levels of blood serum Ascorpic acid (Vit-C) mg % levels of examined sheep.

Items	Minimum mg%	Maximum mg%	Mean ± SD mg%
Arab El - Madabegh	0.31	1.24	0.77 + 0.19**
G. El Akrad	0.36	2.5	0.96 ± 0.48**
Manquabad	0.59	1.93	1.16±0.29**
Bani Ghalib	0.86	2.23	1.49 ± 0.43**
El-walidya	0.50	2.26	1.41 ± 0.41**
El shader	0.15	0.79	0.30 ± 0.15**
Gahdam	0.73	1.25	0.97 ± 0.14**
Control	5.41	13.14	7.44±2.01

N.S: non significant *: significant (P < 0.05)
**: Highly significant (P <0.01)

Discussions

Environmental pollution is one of the most deleterious agents to biological life. Industrialization offered additional hazards to environment surrounding man and animals. Grazing animals are often a reliable indicator of environmental pollution either by food, water or air, they receive contamination which transferred through the food chain to human being **(Antoniou, *et al*, 1995).**

The increase of population, comes from industrialization and agricultural activities results in more and more wastes entering the river Nile. Portable water are difficult attained, for this still drainage canals especially irrigation ones are the sources of drinking water in our villages **(Raghib *Et al*, 2003).**

Consequently this study had been oriented for determination of heavy metals including lead, cadmium and fluorine in water sources and the reflection of these levels on animals health mainely on clinical, haematological and immune status picture in sheep drinking or. grazing around the vicinity of these sources.

The obtained data showed higher heavy metal levels (lead, cadmium & fluorine) in water and feed stuffs if compared with the permissible limits in water and feed stuffs National Academy of **Science (1974) and Underwood (1977)** Blood serum lead cadmium and fluorine levels showed a highly significant increase in the affected sheep grazing around the con-

taminated localities when compared with the control ones.

Such increase in the blood serum lead levels coincided with those of **Chiy *et al*, (2000)**, **Martin and Atikan (2000); Pugh (2002) Raghib *et al*, (2003) and Ahmed (2004)** in sheep in a similar condition. This elevation in blood serum lead levels can be attributed to contamination of drinking water and grazing grasses by lead through industrial contamination or pollution either by domestic and agricultural, sewage contamination or oil spillages and suspended solids (e.g litter and rubbish) **Williams (2001)**.

Regarding the haematological picture in affected sheep grazing or drinking around the polluted area showed a highly significant decrease (P<O.0l) in total erythrocytic count (TRBCS) (Oligocythaemia), decrease in haemoglobin concentration (Hb) and in haematocrit value (P.C.V) with a variable degree of fluctuation in different localities (Table 6) The obtained results revealed a marked macrocytic hypochromic anaemia in affected sheep . **Selim *et al*, (2000)** and **Ahmed (2004).**

The observed anaemic condition (Macrocytic hypochromic) could be attributed to the direct hemolytic effect on mature red blood cells and the failure of bone marrow to produce enough erythrocytes in response to the toxic effect of heavy metal, or as was previous suggested by **Hoffaman *et al*, (1980)**; **Moore, *et al*, (1980) and Gossett (2000).** Other explanation for such behavior was explained by **Ibrahim (1983)** who stated that the decrease in circulated erythrocytes was attributed to the indirect inhibitory effect of lead and cadmium to the haembiosynthesis, by inhibition of Delta amino levulinic acid dehydrase enzynie activity that responsible for the combination of protoprophyrin with iron to "haem" fraction of haemoglobin resulting in a significant decrease of heamoglobin , RBCs and P.C.V. Furthermore **Radostits *et al*, (2000)**-mentioned that lead and cadmium in blood of exposed sheep prevented the incorportation of "glycin" into globin resulting in reduction of haemoglobin concentration.

The observed decrease in total leucocytic count can be attributed to suppression effect of heavy metals on bone marrow leading to such decrease **Radostits *et al*, (2000).**

The occurring lymphocytopenia and monocytosis gave an indication of the chronic affection resulting from persistant high level of heavy metals in the different contaminated localities either in grazing ration or drinking water. In addition the occurring esinophilia in the affected sheep gave an indication of the sensitivity effect of both water and grasses pollution by heavy metal in the formation of esinophils in the bone marrow.

Consequently this study had been oriented for determination of heavy metals including lead, cadmium and fluorine in water sources and the reflection of these levels on animals health manely on clinical, and immune status picture of affected sheep .

The most important clinical signs of the examined sheep in different localities were differed according to localities through which sheep drank contaminated water or grasses with high level of heavy metal in such contaminated area.

These signs include severe emaciation, anorexia, pale mucous membrane dryness and roughness of the skin and specific signs which defer according to the highes level of heavy metal. All these animal drank water of high fluorine content eventually this was reflected upon their fluorine level in their blood sera and consequently on their general health conditions which was reflected in clinical signs. These findings coincided with **Abd all (1981)** in fluoric sheep**; Karram, (1982)** in fluoric goats , and **Ahmed (2004)** in fluoric sheep**.**

The most important spcific clinici signs in sheep grazing and drinking in the area contaminated by high level of lead and cadmium showed unresponsion to external stimuli, blindness, staggering in gait, sometime movement in circle. Sheep often stand their head prssed against any object as wall. Some sheep showed convulsions and lameness Such clinical signs coincided with those previously obtained by many other authors in a similar con-

ditions **(Martin and Atiken 2000, Radostits *et al*, 2000; Roder, 2001** and **Raghib, *et al*, (2003).**

The obtained result showed highly significant (P<0.0 1) decrease in blood serum total protein, albumin and globulin levels 'in all examined sheep, which drinking and grazing on contaminated area when compared with the control group (Table 7) This results agreed with those obtajned by in cow (**Khalf-Allah** and **Abd El Aal, 1999).**

Such hyoproteinaemia and hypoalbuminaemia attributed to gastrointestinal disturbances due to rapidity of digesta flow. It also may be due to liver disturbances and impairement protein synthesis or malnutrition caused by improper mastication and inadequate grazing due to the occurring skeletal pain resulting from fluortic effect. Furthermore, **Coles (1986)** attributed the significant reduction of total serum protein and albumin to the malabsorption of dietary content from intestinal tract. The auther refered the condition to the destructive effect of the toxicity on the hepatic parenchyma resulting in the failure of liver to form albumin. Regarding to protein electrophoresis, the obtained resn its gave five electrophoretic zone namely albumin a_1,a_2,B- globulin and Gama globulin zone in all examined sheep .The obtained data in sheep grazing and drinking around the contaminated area reveled a highly significant decrease in all protein fractions albumin, a_1,a_2,B and gama globulin (Table 8) . These results agreed with that of **Hoffman *et al*, (1980)** in sheep, and Such variation in protein electrophoresis in examined sheep can be explained by **Wingfield (1997)** who said that alpha, Beta and gama globulin make up total globulin concentration. Meanwhile alpha and Beta globulin are produced primarily by the liver while gama globulin are produced by B-lymphocytes and plasma cells.

The obtained data revealed a highly significant decrease (P<0.0l) in blood serum level of ascorbic acid in all examined sheep (Table 9) Such decrease in Vitamin C level can be explained as in all inflammatory diseases. leucocytes and tissue ascorbic acid level are reduced which may be due to increased utilization of ascoribate by the cell involved in the antigen antibody response, Also the authors added that other immune function reduced when Vitamin C has been implicated include interferon, lymphokine and mitogen production.

The anthers added that many environmental toxins such as lead, cadmium, methyl mercury etc have a suppressive effect on the immune system. Their effect which appeared by depressing the response of lymphocytes (T&B) to mitogen and decrease the chemotactic migration of neutrophils. Such immune suppression leads to increase the severity of infections.

References

Abd El-All, Th. S. (1981)."Some studies on fluorosis in sheep in Assiut Province . M. V. Sc. Thesis faculty of Vet . Med. Assut University .

Abd El-Nasser , M . ; Shaaban, A. A.; Seham, M Aly and Manal , M . Sayed (1996). "Lead, copper. Mercury and cadmium levels in River Nile water at some Assiut regions. Egypt". Assiut Vet. Med. J. VoL. 34, No 68 January, 1996

Antoniou, V.; Zantopoules , N. and Tsoukali Papadopoulou, II. (1995) Selected heavy metals concentration in goat liver and kidney" Vet, Hum. Toxicol. 37(1).20 -22

Chiy, P.C.; M.O. Mohammed and C.J.C.Phillips (2000). Effects of prolonged lead supplementation on cadmium accumulation in sheep.Proccedor socity of British Animal Science . pp 100.

Coles, E. H. (1986). "Veterinary Clinical pathology. 4th Ed. W. B Saunders company, Philadelphia and London.

Crompton,T.R (1998). Occurrence and Analysis of organometallic conpounds in the environment. John Wiley & Sons. Ltd Baffins Lane.

Gossett, K.A (2000). Anemias Associated with Drugs and chemicals. In schalm's Vet Hematology

Hoffman, T.J.; W.B.Buck and L.Y. Quinn (1980). Effects of oral lead on Serum proteins and the development of special antibody re-

sponse in cattle &sheep . Am. J. of Vet. Res 41(3)331 337 .

Ibrahim, Th. A. (1983). "Toxicological effects of the by products of the super phosphate plant on Egyptian buffaloes in Assiut . province". Ph. D. Thesis, faculty of Vet. Med. Assiut University .

karram, M. H. (1982). "Studies on fluorosis in goats in Assiut. Province. Ph. D. Thesis, Fac. Vet. Med. Ass. Uni.

Khalaf-AlIah, S. S. and ; Abd E1-Aal, S. A. (1999). "Effect of lead emissions on sheep grazing in heavy industrized area in Helwan, Egypt". Assiut, Vet. Med. J. Vol. 40 No. 80.

Martin, W. B. and Aitken, l. D. (2000). "Diseases of sheep". Blackwell Sci. Oxford 3rd. P 371 373.

Moore ,S ; King , E. and Tomas.J.A. (1980). Lead Arsenate poisoning of sheep and cattle .Arch.Environ ,health 21:140-145 .

National Academy of Science N.A.Sc. (1974). "Sub committee on nutrient and toxic elements in water, Nutrients and toxic substance in water for livestock and poultry". Washington, D.C.

Pugh , D. C. (2002). "Sheep and Goat Medicinc'. 1st Ed. W . B. ' Saunders company, Philadelphia, London, Toronto .

Radostits, O. M.; Gay, C. C.; Blood, D. C. and Hinchcliff, K. W. (2000). "Veterinary Medicine". W. B. Saunders Company Ltd. 9th ed .

Raghib, M. F; Nassif, M. N.; Nasser, 'M. ll.; El-Khodary, S.A. and B. Said, E. M. (2003). "Effect of some heavy metals contents on general health and blood constituents of sheep". Kafr El-Sheikh Vet. Med. J. Vol. 1 No 1 (2003) 383-394 .

Ahmed (2004). Monitoring of clinical and Laboratory in sheep rearing on stagnant water in some localities in Assiut Governorate Ph D Thesis ,Faculty of Vet. Med. Assiut University.

Selim, H. M.; Amany and Abd-Allah, A. M. (2000). "Heniz bodies hemolytic anemia in chronic sulphrosis and fluorosis of farm animals". 9th Sci. Con. 2000, Fac. Vet. Med. Assiut Univ. Egypt Pp 181 -191 .

Tatrai , E.M. Borozik, M. Naray Z .Adamis and G. Ungvary (2001). Combined pulmonary toxicity of cadmium chloride and sodium diethyl dithiocarbanate. J. Appl Toxicol 21 ,101105. Copyright John wiley& Sons,Ltd.

Underwood, E. .J. (1977). Trace elements in human and animal nutrition 4th Ed. Academic press. New York. SanFrancisoco, London. Asubsidiary of Harcaurt Brace. Jovanovich, Pubhlisher .

USEPA (1973). "Proposed criteria for water quality". Vol. 1. Quality environmental reported 4 (16). 663 .

Webster , D.(1974). Colorimetric method for determination of albumin. Clin. Chim. Acta. 53 109

WHO (1997). Guide line for air quality control ,internet On the home page http:// www.who.chII.

Williams,I. (2001). Environmental chemistry. John willy and sons, LTD chichester.

Wingfield, E. W (1997). Hypoproteinemia In veterinary Emergency Medicine Secrets Hanley & I3eifus, Inc. philadeliva .

الاثار الضاره على صحة الاغنام الراعيه على الاعشاب والمياه الملوثه فى بعض المناطق بمحافظة اسيوط

الملخص العربى

استهدفت هذه الدراسه دراسة المخاطر الصحيه الضاره على صحة الاغنام الراعيه على الاعشاب والمياه الملوثه والقاء بعض الضوء على تأثيرها على الجهاز المناعى. وقد أجريت هذه الدراسه على 341 رأسا من النعاج البلديه البالغه والتى تراوحت أعمارها من 3 الى 5 سنوات وتم تقسيم هذه الحيوانات بعد الكشف الاكلينيكى عليها الى ثمانية مجموعات طبقا لمصادر التلوث بمناطق الدراسه.وتم أخذ عينات من مصادر المياه والحشائش الدراسه وكذلك مصل الدم للأغنام التى ترعى بهذه المناطق وترعى حول مناطق التلوث وذلك لقياس معدلات الرصاص –الكاديوم-الفلورين وتم

أخذ عينات من الدم مضافا اليه مانع للتجلط لدراسة الصوره الدمويه (عدد كرات الدم الحمراء-عدد كرات الدم البيضاء- تركيز الهيموجلوبين – نسبة الخلايا المصمته-حساب الخليه الدمويه.وقد تم اجراء التحاليل بأستخدام احدث الاجهزه كما تم عمل التحاليل الاحصائيه الممثله وأوضحت الدراسه عن النتائج التاليه: -1-العناصر الثقيله (الرصاص فى والكاديوم والفلورين) فى المياه والاعشاب فى جميع مناطق الدراسه أعلى من المعدل المسموح به وكذلك أعلى من مستوى هذه العناصر فى المنطقه الضابطه للبحث كما تم دراسة الاعراض الاكلينيكيه وتسجيلها على الحيوانات الراعيه فى تلك المناطق.اختلفت هذه الاعراض على حسب مصادر التلوث بالمناطق موضع البحث واشتملت على اعراض العامه واعراض خاصة هزال وضعف عام-عرج وصعوبه فى السير-انحراف وقله فى الشهيه –تساقط فى الصوف وخشونته وفقدان لبريق -كما كانت بعض الاغنام مصابه باسهال كريه الرائحه والاخرى بامساك واوضحت التحاليل البيوكيميائيه لمصل الدم حدوث زياده معنويه فى قيم الرصاص والكادميوم والفلورين فى جميعمناطق البحث مقارنة بالحد المسموح به وبمستوى هذه العناصر فى الاغنام المستخدمه ضابطه. أما عن الصوره الدمويه أوضحت الدراسه عن وجود انخفاض معنوى جدا فى عدد كريات الدم الحمراء والبيضاء وتركيز الهيموجلوبين فى دم الاغنام المعرضه للتلوث بالعناصر الثقيله فى جميع مناطق الدراسه مقارنة بالمعدل الطبيعى وكذلك وجد بالبحثوجود نقص معنوى جدا فى حجم الخلايا المصمته وقد أوضحت الصوره الدمويه على وجود أنيميا ذات الكريات الكبيره اما العدد التصنيفى لكريات الدم البيضاء فقد وجد نقص معنوى جدا فعدد الخلايا الليمفاويه والخلايا المتعادله معا كما وجد زياده معنويه فى عددالخلايا الحمضيه وخلايا المونوسيت فى دم الاغنام الراعيه حول مناطق

التلوث بالعناصر الثقيلهوكان من نتائج التحليل حدوث نقص معنوى جدا فى كل منالبروتين الكلى والالبيومين والجلوبيولينات فى مصل دم الاغنام فى جميعمناطق البحث مقارنة بمعدلات المجموعه الضابطه والمعدلات الطبيعيهللأغنام.

أوضح الفصل الكهربى لبروتينيات مصل الدم للأغنام انه يشتمل على خمسة مناطق أظهرت نقص معنوى جدا فى معدل كل من الالبيومينوالجلوبيولينات وكذلك اجزاء الجلوبيولينات (ألفا-بيتا-جاما) فى مصل دم الاغنام المعرضه للتلوث بالعناصر سابقة الذكر.

كما حدث نقص معنوى جدا فى مستوى فيتامين ج فى الاغنا م المعرضه للتلوث بالعناصر الثقيله فى جميع مناطق للتلوث بالعناصر الثقيله فى جميع مناطق الدراسه

بالمقارنه بالمجموعه الضابطه ومما سبق فقد أوضحت الدراسه أن تلوث المياه بالمعادن الثقيله مثل الرصاص – الكادميوم والفلورين

له أثار ضاره على صحة الاغنام التى ترعى على المياه والاعشاب الملوثه مما ينعكس على الكبد ممثلا فى نقص البروتين والالبيومين وكذلك الحاله المناعيه لحيوان ممثلا فى نقص الاجسام المناعيه(الجلوبيونات خاصةالجاما)بالاضافه الى نقص فيتامين ج . وقد اعطت الدراسه صوره عن تلوث الماء والاعشاب الناتج من تلوث الهواء كما هوالحال فى المناطق حول مصنع السماد السوبر فوسفات بمنقباد وجزيرة الأكراد-وعوادم السيارات بموقف السيارات بالشادر –لمنطقه الصناعيه ببنى غالب ومحطة الكهرباء بالوليديه والورش حول ترعة الملاح بأسيوط وكذلك التلوث نتيجة استخدام مياه الصرف الصحى فى الزراعات وشرب الاغنام من الترعه الممتده من عرب المدابغ حتى جحدم .

ونوصى بمنع الحيوانات من الرعى حول المياه الملوثه وخاصة القريبه من الاماكن الصناعيه ومنع استخدام مياه الصرف الصحى فى زراعة البرسيم والاعشاب والخضروات التى تستخدم للحيوان والانسان وكذلك الحد من استخدام البنزين المرصص وعدم صرف نواتج ورش السمكره بالترع. ان الاغنام الراعيه فى المناطق القريبه من التلوث يجب اعطائها الفيتامينات وخاصةفيتامين ج حيث ان قدرة الحيوانات الموجوده فى مناطق التلوث تكون غير قادره على تكوين حاجتها من هذا الفيتامين وانخفاض مستواها فى دم الحيوانات مما يدل على هبوط الحاله المناعيه لهذه الحيوانات ويجعلها عرضه للاصابه بالامراض.