



Biochemistry Department

Evaluation of some biochemical parameters of sheep in West Alexandria area

Thesis

Submitted for the degree of Master of Science as a partial fulfillment for
requirements of M.Sc. Degree in Biochemistry

Submitted By

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(B.Sc. in Biochemistry, 2004)

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Approval sheet

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Abstract

Drainage water provides an integral supplement to Egypt's water supply. As with many countries through the world that have turned to non-conventional sources in the face of freshwater scarcity, the reuse of drainage water is one of the main reasons why Egyptians can use a larger quantity of water than that which flows into the country, falls as rain, and is pumped from deep aquifers each year. The potential health risks and environmental impacts due to wastewater use for irrigation have been well documented. Although pesticides facilitate the anthropogenic land use, they usually cause danger to the biotic species and seriously damage the human living environment. Using natural clay minerals such as bentonite and zeolite for water and wastewater treatment are increasing due to their abundance, low price, and adsorption capabilities, as well as ion exchange that is highly capable of adsorbing all kinds of pollutants for some organic and inorganic compounds, including heavy metals in waters. The objective of this study is to Identify the side effects to which animals are exposed due to exposure to pollution from west Alexandria region through Evaluating the level of selected heavy metals in serum, milk and water samples and comparing the results to globally acceptable standards, Detecting the presence of pesticide residues in water and milk samples, Assessing the effect of the contaminated water on the liver, kidney and heart of sheep for possible prediction of effects on human and Investigate the remediating effect of bentonite . This study was conducted on 30 dry female sheep, age 2-3 years each weighing about 25-35 Kg, randomly divided into 3 groups 10 animals each according to the received water, the control group received fresh tap water , the 2nd group received water from the studied drain and the 3rd group received drain water plus 4 % bentonite . The study revealed that there were marked significant differences between the biochemical parameters of treatment animals when compared to control animals. There is no an elevated risk of E. coli contamination as illustrated by the low frequency of E. coli detected on the water samples. Also prolonged exposure to heavy metals from polluted water can develop serious health

problems as a result of excessive accumulation of these metals in the human body through dietary intakes.

Key words: *Drainage water, Heavy metals, Pesticide residues, Barki sheep and Bentonite.*

Dedication

I dedicate this work to whom my heart felt thanks; to my parents , my husband, my sons Mohamed and Ahmed for their patience and help , as well as my brothers and my sisters for all the support they lovely offered along the period of the study. and for the soul of my Godfather Abdel Fattah Rashed , may God bless his soul .

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Manar Ali

Acronyms and abbreviations

4-AP:	Amino-4-antipyrine
ADP:	Adenosine diphosphate
AgNO ₃ :	Silver nitrate
AIUM :	Auroville Innovative Urban Management.
ALP:	Alkaline phosphatase
ALT:	Alanine aminotransferase
AMP:	Adenosine monophosphate
ANOVA:	Analysis of variance
ARLA:	acute ruminal lactic acidosis.
AST:	Aspartate aminotransferase
ATP:	Adenosine triphosphate
CBC:	Complete blood picture
CfU :	Colony forming unit .
CHD :	Coronary Heart Disease
CK-B:	Creatine-kinase B fraction
CK-M:	Creatine-kinase M fraction
CK-MB:	Creatine-kinase MB fraction
CO ₃ ²⁻ :	Carbonate
CPK:	Creatine phosphokinase
DEA:	Diethanolamine
DRC:	Desert Research Center
dS/cm:	DeciSemens/centimeter

EC:	Electric conductivity
EDTA:	Ethylene diamine tetra acetic acid
EMB:	Eosin methylene blue
EPA :	Environmental Protection Agency.
G6P:	Glucose-6-phosphate
G6PDH:	Glucose-6-phosphate dehydrogenase
GOD:	Glucose oxidase
H ₂ O ₂ :	Hydrogen peroxide
Hb :	Hemoglobin
HCl :	Hydrochloric acid
HCO ₃ ⁻ :	Bicarbonate
Hct :	Hematocrit
HK:	Hexokinase
HM :	Heavy metals
HNO ₃ :	Nitric acid
HPLC:	High pressure liquid chromatography
iCAP :	Inductively Coupled Argon Plasma
IHD :	Ischemic Heart Disease
IOM :	Institute of Medicine ; Dietary Reference Intakes.
KCl :	Potassium chloride
KCN:	Potassium Cyanide
LBW :	Low birth weight
LDH:	Lactate dehydrogenase

MCH:	Mean corpuscular haemoglobin
MCHC:	Mean corpuscular haemoglobin count
MCV:	Mean corpuscular volume
MDH:	Malate dehydrogenase
MeqL :	Milligram equivalent per liter
MPN:	The most probable number
MTF:	Membrane filtration technique
NAC:	N-acetyl-L-cysteine
NADH:	Nicotinamide adenine dinucleotide
NADP:	Adenine dinucleotide phosphate
NRC :	National Research Council.
NRC :	National Research Council.
OPP:	Organophosphate Pesticide Poisoning
PCV:	Packed cell volume
pH:	Concentration of hydrogen ion
POD:	Peroxidase
RBC:	Erythrocyte count (red blood cells)
SAR:	Sodium adsorption ratio
SO ₄ ²⁺ :	Sulphate
SOD :	Super oxide dismutase
TDS:	Total dissolved solids
TRBC:	Total red blood cell count
US FDA	US Food and Drug Administration

US.G.A.O : US. General Accounting Office

WHO : World Health Organization

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