# Diabetes in dogs

Thesis presented by:

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## SUPERVISION SHEET

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**Thesis Title: "Diabetes in dogs"**

**Abstract**

The aim of this study is to investigate the diabetes in obese and emaciated dogs. Overweight dogs are considered clinically obese when body weight exceeds optimum weight for body size by at least 15%, while dogs are considered emaciated when they lose a substantial amount of both body fat and muscle tissue, resulting in a body weight that is at least 20–25% less than an ideal weight. Therefore, the present study was designed to classify 125 dogs according to their body condition scores (BCS); age and health state into four main groups (apparently healthy, diseased, young and old); respectively and investigate some of their biochemical and hematological blood constituents. The first group of apparently healthy dogs, old obese dogs showed significant ($p<0.05$) increase in alkaline phosphatase enzyme (ALP). Random blood sugar (RBS) level showed significant ($p<0.05$) decrease in young emaciated dogs. Also, there was significant ($p<0.05$) increase in the values of erythrocytes count (RBCs), hemoglobin concentration (Hb) and Packed cell volume (PCV) of old obese dogs. While in the second group of diseased dogs, old emaciated dogs showed a significant ($p<0.05$) increase in ALP. RBS showed significant ($p<0.05$) increase in young obese dogs. Also, young obese dogs showed a significant ($p<0.05$) decrease in Urea. It was concluded that age and BCS have significant effect on different blood parameters and health state of the dog. Also, there are no diabetic cases in our study.

**Key words:** Diabetes, Obesity, Emaciation, Age, Health state, Blood parameters.

*Dedication*

*I dedicate this thesis to my beloved father who could not be with us today. May his soul rest in peace and May Allah forgive grant him Jannet Alferdaws.*

*And to my mother, who showed me nothing but unconditional love. I will be forever grateful to you.*

*To my third brother Ahmed, who left us years ago, but still lives in our hearts.*

*To my family, Aunt Mona, Uncle Adel, Samar, Mohammed, Dalia, Ahmed, Menna and Karim, you were an essential motivation for me to finish this thesis.*

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*To my husband, thanks for your patience and understanding. I could not have done it without you.*

*And to my little angel, Iam grateful for having you in my life.*

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# Contents:

## List of abbreviations:

| | |
|---|---|
| **A** | Albumin |
| **ALT** | Alanine aminotransferase |
| **ALP** | Alkaline phosphatase |
| **ASPCA** | American Society for the Prevention of Cruelty to Animals |
| **AST** | Aspartate aminotransferase |
| **BUN** | Blood Urea Nitrogen |
| **BCS** | Body Condition Score |
| **BF** | Body Fat |
| **BMC** | Bone Mineral Content |
| **C** | Celsius |
| **cm** | Centimeter |
| **CKD** | Chronic Kidney Disease |
| **CBC** | Complete Blood Count |
| **CT** | Computed Tomography |
| **CHF** | Congenital Heart Failure |
| **cmm** | Cubic centimeter |
| **dl** | Deciliter |
| **D2O** | Deuterium Oxide |
| **DM** | Diabetes Mellitus |
| **DCM** | Dilated Cardiomyopathy |
| **DEXA** | Dual Energy X-ray |
| **Fl** | Femtoliter |
| **GGT** | Gamma Glutamyl Transferase |
| **G** | Globulin |
| **g** | Gram |
| **GH** | Growth Hormone |
| **HC** | Hemoglobin Content |
| **Kg** | Kilogram |
| **KV** | Kilo Volt |
| **LBM** | Lean Body Mass |
| **L** | Liter |
| **MRI** | Magnetic Resonance Image |
| **MS** | Metabolic Syndrome |
| **MCH** | Mean Corpuscular Hemoglobin |
| **MCHC** | Mean Corpuscular Hemoglobin Concentration |
| **MCV** | Mean Corpuscular Volume |
| **m** | Meter |
| **µl** | Microliter |
| **mg** | Milligram |
| **mmol** | Millimole |

| | |
|---|---|
| **MTACCSs** | Modified Tufts Animal Care and Condition Scale System |
| **MCS** | Muscle Condition Score |
| **N** | Number of dogs |
| **PCV** | Packed cell volume |
| **Pg** | Picogram |
| **PLT** | Platelet Count |
| **POC** | Point-of-Care |
| **PD** | Polydipsia |
| **PCR** | Polymerase Chain Reaction |
| **PU** | Polyurea |
| **PH** | Potential Hydrogen |
| **QMR** | Quantitative Magnetic Resonance |
| **RBS** | Random Blood Sugar |
| **RBCs** | Red Blood Cells |
| **Rpm** | Round per minute |
| **S-GPT** | Serum glutamic pyruvic transaminase |
| **IGF-I** | Serum Insulin-like Growth Factor I |
| **SD** | Standard Deviation |
| **SE** | Standard Error |
| **TLC** | Total Leukocyte Count |
| **T2DM** | Type 2 Diabetes Mellitus |
| **US** | Ultrasonography |
| **U** | Unit |
| **UK** | United Kingdom |
| **USA** | United States of America |
| **USMI** | Urethral Sphincter Mechanism Incompetence |
| **VLDL** | Very Low Density Lipoproteins |

## List of tables:

## List of figures:

# INTRODUCTION