Cairo University
Faculty of Veterinary Medicine
Dept. of Nutrition and Clinical Nutrition

(Effect of two energy sources on diet digestibility and growth of puppies)

Thesis

Submitted by

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(B.V.Sc., Cairo University, 2012)

For

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(Nutrition and Clinical Nutrition)

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Abstract:

This study was carried out in two steps: **In Part one**, a surveillance study was conducted to evaluate the nutritional value and safety of dry dog foods (puppy stage) currently available in Egyptian market. Consequently a total of (100) extruded dry dog food samples for puppy stage (18 imported and 2 locally produced) were collected from different batches during the period from December 2013 to April 2014 and subjected to proximate chemical analysis for determinations of Moisture, Crude protein, Ether extract, Crude fibre and total ash%. Moreover, all samples were examined for their water activity values as well as Mycotoxins levels (Aflatoxins, Afl and Ochratoxins, Ochr). Results of proximate chemical analysis percentage in comparison with values stated on the label revealed that, the moisture contents ranged from 4.95 ±0.4 to 11.36 ±0.5, CP contents ranged from 23.37±0.7 to 40.96±0.75, EE ranged from 5.35±0.85 to 19.21±1, values of CF ranged from 1.30±0.23 to 4.19±0.31 and total ash contents ranged from 3.48±0.85 to 12.49 ±0.8.Water activity values (a_w) in the examined samples ranged from 0.43 ± 0.03 to 0.71 ± 0. 03 in comparison to the standard acceptable level of 0.6 for dry food, a condition that may be explained on the basis that the examined puppies foods might be subjected to excessive dryness during the manufacture as a tool for protection against microbial growth. Results of Afl levels detected in the examined food samples revealed that all samples were proved to be positive for the presence of Afl as 30% of them were over the permissible limits, which ranged from 1.2±0.18 to 17.6±0.3 ppb. Furthermore, all examined samples were proved to be positive for Ochr with minimum and maximum levels 0f 3.9±0.2 and 42.3±1.9 ppb, respectively. Results of this survey highlight the importance of not only the inspection of the nutritional quality but also the safety of the dry dog foods (puppy stage) currently available in the Egyptian market. It is worth to say that much research activities are required to ameliorate the effect of the excess heat dryness on the protein quality and nutrients availability, nonetheless, the hazard threat of undefined limits of mycotoxins in dog foods currently available in Egyptian market.

In Part two, an experimental feeding study was conducted to visualize the response of young growing puppies to two levels of fats oils using iso-nitrogenous equi-caloric diets. Eight (8) Labrador retriever breed puppies (6 females and 2 males from the same mother) with 60 days age and with an average live body weight of 6.750 ± 1.100 kg (LBW) were assigned to two groups each of 4 puppies (3 females and only one male) and housed in individual kennels; (1 × 1.2 m) and had access to an outside kennel (10 × 20 m) for exercise. On the basis of data obtained in part one, two iso- nitrogenous iso-caloric diets of the same fiber content were prepared by mixing suitable amounts of two commercial dry food

brands on the basis of their actual chemical composition. The first diet was mixed and prepared to contain 18.5% fat and 41.5% CHO (Higher fat group). Meanwhile, the second diet was mixed and prepared to contain 12% fat and 48.5% CHO (Lower fat group). Each dog in both groups was fed separately on the appropriate amount of food. The feeding trial lasted for 14 weeks.

Results revealed that feeding of young growing Labrador retriever puppies higher levels of fats and oils has a positive significant ($P \leq 0.05$) impact on their growth performance parameters including interval and final body weight, body weight gain, actual food amounts and also significantly reduced total amounts of refusal food. Higher levels of fats and oils diet resulted in a significant elevation of total Cholesterol and LDL levels. Meanwhile HDL, VLDL and total triglycerides levels and fasting serum glucose were not affected .In addition, the puppies received higher fats and oils level exhibited a marked significant increase in serum concentrations of IGF-1 level but not affected the serum insulin concentration. Finally, the higher fat and oils diets resulted in a significant ($P \leq 0.05$) increase in both digestible nitrogen absorption percent and fat absorption percent. **Keywords: dry dog food; proximate analysis; water activity; Mycotoxins; safety; fats and oil; growth.**

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Contents

List of tables

List of figures