INFLUENCE OF DIETARY FLAX SEED OIL AND SUN FLOWER OIL ON PRODUCTIVE AND REPRODUCTIVE PERFORMANCE AND OVARIAN ACTIVITY OF FARAFRA EWES.

By

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B. Sc. Agric. Sci (General Department), Minia University, 2002

M. Sc. Thesis Submitted to Assiut University
In Partial Fulfillment of the Requirements for the Degree of Master of Science
In

(Animal Production - Animal Physiology)

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2020

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This study was carried out at Malawi Animal Production Research Station on 105 Farafra ewes. The aim of this study was to determine the effects of sun flower seed oil (as a source of omega 6) and flax seed oil (as a source of omega 3) on productive and reproductive performance and ovarian activity of Farafra ewes and growth performances of their lambs.

The experimental animals were divided into three treatment groups similar in initial body weight and age. The first group served as control (C), ewes were fed control diet (concentrate feed mixture without any supplement). The second group (SF), ewes were fed on control diet plus 2.5% sun flower seed oil. The third group (FS), ewes were fed on control diet plus 2.5% flax seed oil. Ewes were fed for 3 weeks as a transitional period on the experimental rations before the start of the experiment. The experimental period lasted for about 9 months, 3 weeks transitional period, 45 days animals fed experimental diets, 35 days mating period, 5 months pregnancy period and 45 days post-partum ovarian activity. Lamb performance trial lasted for 60 days (from birth to weaning). Ewes weighed at the beginning of the experiment then biweekly in early morning before feeding until the end of experiment, while lambs were weighted weekly from birth to weaning. Ewes were kept in semi open pens under the normal environmental conditions. Fresh water was available all day time.

Ewes in each group (35 ewes) were divided into two subgroups, 20 ewes were remaining with normal estrus (without injection of PGF2α), and 15 ewes were synchronized for estrus using PGF2α. The ultrasonography examinations were performed transrectally by the same operator using the Chison Ultrasonic Scanner. After lambing, birth weight of newborn lambs was recorded immediately, then weekly to weaning. Daily gain for each lamb was calculated. Blood samples (10 ml) were collected from each ewe via jugular vein in a glass tube with

anticoagulant (EDITA) at morning before feeding. Blood samples were collected on days 0, 1, 2, and 3 after the second dose of the PGF2α and on days 18, 45, 60 after mating period. Furthermore, blood samples were collected monthly during pregnancy and at days 7, 14 and 21 after lambing.

The data were statistically analyzed using (SPSS)

Results obtained could be summarizing in the following:-

a- Ewes body weight changes

1- During pregnancy, ewes fed sun flower seed oil and flax seed oil had higher body weight and body weight changes ($P< 0.05$) than that of control group.

2- During pre-mating and lactation periods, body weight or body weight changes of ewes did not significantly affected by feeding sun flower seed oil or flax seed oil.

b- Fertility of mature ewes

1- Dietary sun flower seed oil (as a source of omega 6) and flax seed oil (as a source of omega 3) treatment groups tended to have higher number of ewes exhibited estrus, ewes exhibited estrus as a percentage of total ewes, number of lambed ewes, conception rate, % of mated ewes and conception rate as a percentage of total ewes as compared with control group.

2- Number of lambs born tended to be higher in ewes fed on sun flower seed oil and flax seed oil than those fed on control diet.

3- Dietary sun flower seed oil (as a source of omega 6) increased female, while flax seed oil (as a source of omega 3) increased male at birth, however such result may require further study.

4- Dietary sun flower seed oil increased twining rate and litter size.

5- Dietary sun flower seed oil and flax seed oil had no effect on average

birth weight, total birth weight/ewe and weaning weight as compared with control diet.

c- Lambs growth performance

Lambs body weight and daily gain of lambs born to ewes fed FS and SF were not affected by dietary treatments.

d- Blood metabolites

1- Ewes fed flax seed oil had higher ($P<0.05$) plasma total cholesterol concentration than those fed sun flower seed oil and control diet.

2- Ewes fed sun flower seed oil had higher ($P<0.05$) plasma triglycerides level than those fed flax seed oil and control diet.

3- Ewes fed flax seed oil and sun flower seed oil had higher ($P<0.05$) plasma high-density lipoprotein cholesterol concentration than those fed control diet.

4- Ewes fed sun flower seed oil had higher ($P<0.05$) plasma aspartate amino transferase level than those fed flax seed oil and control group, however such differences were within physiological values which means no deleterious effects of treatments on liver function.

5- Ewes fed sun flower seed oil had higher ($P<0.05$) plasma glucose concentration than those fed flax seed oil and control diet.

6- Dietary sun flower seed oil and flax seed oil had no significant effects on plasma alanine transaminase (ALT), urea, total protein, albumin and globulin.

7- Plasma progesterone level tended to be higher in ewes fed flax seed oil and sun flower seed oil compared to those fed control diet.

e- Ovarian follicular dynamics

1- Ewes fed flax seed oil and sun flower seed oil had higher ($P<0.05$) number of ovarian follicles after injection with prostaglandin than those fed control diet.

2- Ewes fed flax seed oil had higher ($P<0.05$) diameter of ovarian

follicles after injection with prostaglandin than those fed control diet

f- Resumption of ovarian activity at post-partum

2- Dietary FS or SF oil had no significant effects on number and diameter of ovarian follicles at post- partum period.

3- Dietary SF and FS treated-ewes tended to have shorter period for uterine involution compared to control ones.