

**STUDIES ON FERTILITY OF BARKI SHEEP  
UNDER DESERT CONDITIONS**

**By**

**MOHAMED AWAD ABD EL-HAMEED  
MOUSTAFA EL-WAKEEL**

**B.Sc. Agric. Sci. (Animal and Poultry Production), Fac. Agric., Benha Univ., 2012**

**THESIS**

**Submitted in Partial Fulfillment of the  
Requirements for the Degree of**

**MASTER OF SCIENCE**

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APPROVAL SHEET

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**Date: 2 / 5 / 2019**



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### ABSTRACT

This investigation was designed to assess some reproductive traits for improving fertility, increasing twinning rate and milk production in Barki ewes using some different hormonal protocols for estrus synchronization and superovulation. In this regard, seventy-five non-pregnant and non-lactating Barki ewes were randomly allocated into three equal groups (25 ewes each). The first group (G1) served as a control without any hormonal treatment. The second group (G2) was treated with an intravaginal progestagen impregnated sponge for 12 days then was removed. On the ninth day, all treated ewes received an intramuscular injection of prostaglandin  $F_{2\alpha}$ . The third group (G3) was synchronized as G2, moreover, on the 10<sup>th</sup> day ewes received an intramuscular injection of PMSG (750 IU/ewe) in descending doses for three days so that the last dose was injected at the 12<sup>th</sup> day concurrently with sponges removal. Meanwhile, on the 14<sup>th</sup> day, ewes of G3 received an intramuscular injection of hCG (500 IU/ewe). The results showed an increase in plasma progesterone level from the first day of pregnancy up to the last day before parturition. Progesterone (P4) was found to be higher in G3 (that had higher twinning rate) than in G2 followed by the control group. Mean concentration of P4 level was found to be 12.74 ng/ml in G3 and 12.10 ng/ml in G2 while the lowest value was observed in G1 (11.14 ng/ml). Insignificant increase in estrus response was observed in groups (G2, G3) compared to the control group (100, 100 and 92%, respectively). Conception rate was significantly higher in G3 than G2 and G1 (100, 92 and 88%, respectively). While, abortion rate recorded 9.0, 0.0 and 0.0 % for (G1) and surpassing G2 and G3, respectively. Lambing rate was significantly higher in G3 as compared to G2 and G1 groups 100, 92 and 80 %, respectively. While, weaning rate was recorded to be insignificantly higher in G2 than G1 and G3 (100.0, 95.45 and 94.29%, respectively). The influence of superovulation treatment was observed for G3 treatment, as triple rate showed significant increase in G3 as compared to G2 and control group. The aforementioned results were accompanied with high values for fecundity rate, litter size at birth with acceptable litter size at weaning and weaning weight. Milk yield and its compositions showed that milk yield in G3 was significantly higher than G2 and G1 (572.83, 535.50 and 495.10 ml/ewe/day, respectively). While milk compositions (fat, protein, lactose, total solids and solids not fat). Fat concentrations showed that overall mean of G1 was non-significantly higher than G2 and G3 (4.29, 4.10 and 4.07 %, respectively), Protein concentrations showed that G2 and G3 was significantly higher than G1 (4.98, 4.69 and 4.38 %, respectively). Lactose concentrations showed that G2 was non-significantly higher than G1 and significantly higher than G3 (5.71, 5.38 and 5.26 %, respectively). It could be concluded that Barki breed have the ability for improving fertility and higher productive and reproductive traits using hormonal manipulation including estrous synchronization and superovulation treatments in the presence of hCG injection.

**Key words:** Barki ewes, synchronization, superovulation, twinning, reproduction, milk yield, milk compositions.

## DEDICATION

*I would like to dedicate this work to the soul of (my Father), who I had hoped to share with me this moment, who made all the effort, money to bring me to this stage. May Allah rest his soul.*

*Also, I dedicate this work to my mother, my brother, my sisters and my wife for all the support they lovely offered to me to reach this moment.*

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## LIST OF ABBREVIATIONS

®	Trade name
ADG	Average daily gain
AI	Artificial insemination
BW	Body weight
CL	Corpus luteum
D	Day
DM	Dry matter
CIDR	Controlled internal drug releasing device
CP	Crude protein
CF	Crude fiber
eCG	Equine chorionic gonadotropin
E <sub>2</sub>	Estradiol -17 $\beta$
ELISA	Enzyme – linked immuno sorbent assay
EE	Ether extract
EU	European union
FGA	Fluorogestone acetate
FSH	Follicle stimulating hormone
G	Group
g	Gram
GnRH	Gonadotropin releasing hormone
hCG	Human chorionic gonadotropin
IU	International unit
Kg	Kilogram
IM	Intramuscular
LBW	Live body weight
LH	Luteinizing hormone
LSB	litter size at birth
LSW	litter size at weaning
MAP	Medroxyprogesterone acetate
ml	Milliliter
ml/h/d	Milliliter per head per day
ng/ml	Nanogram per milliliter
NS	Non-significant
NFE	Nitrogen free extract

OM	Organic matter
P <sub>4</sub>	Progesterone
PG	Prostaglandins
PGF <sub>2</sub> α	Prostaglandin F <sub>2</sub> alpha
PMSG	Pregnant mare serum gonadotropin
PID	Progesterone intravaginal device
PPM	Part per million
SE	Standard error
T	Treatment
TDS	Total dissolved salts
TS	Total solid
SNF	Solid not fat
WW	Weaning weight

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