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EFFECT OF FENUGREEK SEEDS (*TRIGONELLA FOEUM GRAECUML.*) ON HEAMATOLOGICAL AND BIOCHEMICAL PERFORMANCE OF PREGNANT AND NON PREGNANT EWES

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INTRODUCTION

One of the important legumes as a source of protein is Fenugreek seed (*Trigonella Foeum*-graecium). It is used as food and as a medicine to cure certain ailiments. Fenugreek is considered as a highly nutritive seeds since it contain essential and non essential amino acids. The active substances are *Trigonelline, galactamman, choline, sterod, saponins and Flavonainds* other pharmacological properties of Fenugreek (Rao *et al*., 1996) is to stimulate appetite and increase milk production and progesterone, oxytocin and thyroid hormone levels. So it considered to be as autcrine stimulant and to induce labour (Bing *et al*., 1991) and it was used as spermicidal and contraceptive agent. The present study was designed to investigate the effects of *Trigonella Foenum* of oral administration on biochemical, haematologial on pregnant and non pregnant ewes.

MATERIAL AND METHODS

This trial was conducted on 28Sudanese desert ewes 14 non pregnant aged 2-3, weight 32-34 kg.

The animals were weight and divided randomly into two groups. Group 1 was (G1) untreated and left as a control group (G_2) were given oral doses of *Trigonella Foneum* 2.5g/kbwt/day for 7 weeks- 14 healthy pregnant ewes at late stage of pregnancy (14-16) weeks, aged 2-3 years.* All the animals were kept within the premises of the CVI at soba, under appropriate hygienic conditions and Fed with balance feed (concentration and Forage) and water was supplied at libidum The pregnant animals were divided randomly into 2 groups each 7 ewes. GP1 were untreated and used as a control GP_2 were given oral administration of 2.5 g/kg bwt by drench until deliver. Body weights were measured and blood samples were collected by jugular vein puncture weekly for haematology. Haemoglobin concentration (Hb) packed cell volume (PCV) Red Blood Cell (RBC) white blood cell (WBC) count were estimated.

Hb concentrations was measured by the cyanmethaemoglobin technique using a haemoglobin meter (Corning, England). The packed cell volume values were measured by using the microhaematocrit method (Hawks lay and Sons Ltd. England).

Statistical analysis

The obtained data were expressed as mean ± SEM and the results were subjected to statistical analysis by using one-way ANOVA test. The significance difference $P<0.05$.

RESULTS

Haematological data are represented in table (1) the Hb values in G_2 were higher than G_1 (control) the difference was significant at $P<0.05$). Group 2 showed the highest values of RBCs ($P<0.05$) compared with the control one. The mean values of WBCs showed no significant changes while the mean value of PCV showed a significant higher.

Table (1): Mean ± SEM values of Hb, RBC, WBC and PCV changes in ewes dosed orally with 2.5 g/k bwt of *Trigonella foneum* daily for 7 weeks.

Groups parameter	G1 (control)	G2(2.5g/kgbwt/day
Hb)g/dl)	8.91a ± 0.05	10.56b ± 1.16
RBC(X106uM3	8.89b ± 0.08	11.13a± 0.09
WBC (x103xuM3	8.06b±0.03	8.02b ± 0.01
PCV%	18.92b ± 0.18	21.60a± 0.09

Values with different superscript I same rows were significantly different at (P<o.5).

Serobiochemical data are summarized in table (2) the increase activities of SGPT, SGOT in G_2 and ALP was not significant at ($P<0.05$) the compared with the control but no significant changes in the concentration of total protein, albumin, and bilrubia in G_2.

Table 2: Means values of some serobiochemical changes in sheep dosed orally with different doses of *Trigonella foneum* for 7 weeks.

Groups / Parameter	G1 (control)	G2 1.25g/kg Bwt/day	G3 2.5g/kg Bwt/day	G4 5g.kg But/day
Glucose (µg/dl)	45.69^{a} ±0.33	41.55^{ab} ±0.96	39.09^{b} ±0.07	39.27^{b} ±0.46
Cholesterol (µg/dl)	143.61^{a} ±0.49	140.18^{ab} ±0.07	137.53^{b} ±0.035	139.31^{ab} ±0.03
Urea (g/dl)	26.35^{a} ±0.18	24.74^{ab} ±0.038	23.34^{b} ±0.01	23.75^{ab} ±0.46
Na^{+} (MEq/1)	119.38^{b} ±0.060	116.78^{b} ±0.021	118.85^{b} ±0.25	122.03^{a} ±0.21
K^{+} (MEq/1)	2.59^{b} ±0.04	2.64^{b} ±0.03	2.34^{b} ±0.05	2.96^{a} ±0.05

*Values with different superscript letter in same rows were significantly different at (P<0.05). Values with different small superscripts within same rows were significantly different at (P<0.05)

The weekly mean values of progesterone (ng/µg) levels during 7 weeks were mentioned in table (3) the serum progesterone profiles showed gradual significant lower during the period of treatment in group (2) than that of control

Table 3: Mean ±SEM of progesterone (ng/µl) levels in serum sheep dosed orally with 2.5 and 5g/kg bwt of *Trigonella foneum* for 7 weeks.

Time in weeks	G1 Control	G2 2.5g/kg/bwt	G3 5g/kg/bwt	P-value
W1	$1.23±3.06^{a}$	$1.22±3.00^{a}$	$1.19±2.00^{a}$	0.289
W2	$1.21±3.06^{a}$	$1.21±2.31^{a}$	$1.19±5.77^{a}$	0.568
W3	$1.20±2.52^{a}$	$1.22±0.051^{b}$	$1.18±0.035^{b}$	0.343
W4	$1.23±2.52^{a}$	1.19±5.13	$1.15±3.52^{a}$	0.146
W5	$1.24±1.00^{b}$	$1.17±7.57^{a}$	$1.12±1.53^{a}$	0.042
W6	$1.23±3.51^{a}$	$1.13±9.07^{a}$	$1.05±7.09^{a}$	0.052
W7	$1.22±4.36^{a}$	$1.05±0.12^{a}$	$0.98±0.14^{a}$	0.116

Values with different small superscripts within same rows were significantly different at (P<0.05).

Tebal 4: Means ±SEM values of serobiochemical changes in pregnant ewes dosed orally with *Trigonella foneum* seeds for 6 weeks.

Groups / Parameters	Pregnant (P1) (control)	Pregnant treated (P2) 2.5g/kg bwt/day
SGPT (i.u)	9.73^{b}±0.03	10.47^{b}±0.56
SGOT (i.u	26.68^{a}±0.09	31.30^{b}±1.96
Alkaline phosphatase (ALP)	84.06^{b}±0.04	85.44^{a}±0.50
Total protein (g/dl)	7.85^{a}±0.11	5.33^{b}±0.32
Albumin (g/dl)	3.35^{a}±0.04	3.19^{a}±0.13
Bilirubin (µg/dl)	3.54^{a}±0.04	4.8^{b}±0.16

Values with different superscript letter in the same rows were significantly different at P<0.05).

DISCUSSION

The Hb concentration in bob pregnant ewes G_2 showed significant higher values and this may be due to supplementation of high levels of protein found in *Trigonella foneum*. This result is in agreement with that of Shutt and McDonald (1965). Manston *et al.* (1975). The highest of RBCs values and PCV were observed in G2. Our observation may be attributed to high protein content of Fenugreek that can be utilized as alternative to animal proteins which influence on physiological functional properties. This finding is in agreement with (Kinsella and Phillops, 1989) and with (Mahajoub, 1989). Our finding were not in agreement with findings of (ALshaik, 2002). This may be due to doses and physiological states of the animals.

The mean WBCs counts were found to be within the normal range in G2 compared with the control values. The finding is in agreement with Elsa and Onyeyli (2002). For our knowledge this the first study revealed that the reproductive efficiency of the pregnant ewes is concerned, the effect of *Trigonella foneum* seeds to have an adverse effect on their reproductive potential with regard to the haematological changes, the values of RBCs WBCs, Ab and PCV decrease gradually with the advancement of pregnancy. The significant decrease in Hb values may be related to sever diarrhea caused by fenugreek administration which caused the decreased absorption of nutrient material, which explained the decreased of Hb levels. Although this response may be attributed to the fact the foetus will mainly depend on the iron resource of its mother. And this agree with that of Tageldin (2000) and shut and McDonald (1965). The significant decrease of PCV and red blood cells values in pregnant ewes are in agreement with that obtained by Elsherif and Assad (2001) and Ozegbe (2001). This decline of above mentioned levels might probably attributed to Fenugreek supplementation which contained high level of protein which might overcome the adverse effect of diarrhea. However, that can reflected on physiological anemia associated with pregnancy. The decrease in WBCs counts was agreed with of Treacher *el al*. (1976) and Elsaaud Onyeyili (2002). The differences between pregnant and non pregnant ewes in heamatological parameters throughout the last stages of pregnancy might indicate a great need for oxygen consumption to meet the requirement of pregnancy high metabolic rate.

Serum progesterone profile showed gradual lower concentrations during the period of the treatment in non pregnant ewes. This may be attributed to the enhancement effect of fenugreek protein on pituitary gland to secrete gonadotrophines which suppress progesterone

secretion. Out result was in agreement with that of Zabra (1994) and similar observation in sheep was reported by Kassen (2006).

This study show for the first time the significant declining of progesterone concentrations after a demonstration of fenugreek seeds to pregnant ewe sit appears to be more important that fenugreek seed caused abortion in late pregnant ewes. This abortions probably attributed reductions in progestone profile associated with the increase in estrogen concentrations can affect embryo survival during late stage of pregnancy. Also due to stimulant effect of fenugreek on utrine smooth muscles contraction similar result mentioned by Hale (2002) on isolated uterus of guinea pig. Our observation agree with that of kassem (2006) who reported that rabbits fed fenugreek as 30% of their diet reduced fetal and placental weights and agree with that of (Kinight and kukudy, 1990) who conducted that the decrease of progesterone levels may be due to the low production of progesterone by ovary and placenta. While the increase in estraidiol level in late pregnant ewes obtained this may be attributed to adverse effects of fenugreek seeds which contain flavonids (Phyoestrogens) who's action in regulating the hormonal production and facilitate the development of diosgenin, which is used in the synthesis of steroid hormones. The same observation reported by Forsyth (1993).

REFERENCES

1. Abo, El-Nor, S.A.H. Influence of Fenugreek seeds as a galactogogue on milk yield. Milk composition and different blood biochemical of lactating buffaloes during mid lactation. Egypt. J. Dairy Sci., 1999; 27: 231-238.
2. Baril, G., Le boeuf, B. and Saumande, J. Synchronization of estrus in goats: the relationship between time of occurrence of estrus and fertility following artificial inemination, Therigenol., 1993; 40: 621-628.
3. Beltramen, E., Foxcroft, G.R., Aheme, F.X. and Kirlwood, R.N., Endocrinology of nutritional Flushing in gilts. Can. J. Anim. Sci., 1991; 71: 1063-1071.
4. Blauwiekel, R. and Kincaid, R.L. Effect of crude protein and solubility on performance and blood constituents of dairy cows. J. Dairy Sci., 1986; 69: 2091-2098.
5. Corteel, J.M. The use of progestogen to control the oestrus cycle of dairy goat. Ann. Bio-Anim. Biochem. Biophys, 1975; 15: 352-363.
6. Corteel, J.M. The use of progestogen to control the oestrus cycle of dairy goat. Ann. Bio-Anim. Biochem. Biophys, 1975; 15: 352-363.

7. Kusina, N.T. Chinuwo, T.; Hamudikuwanda, H., Ndlow, L.R. and Muzanen hamo, S. Effect of different dietary energy level intakes on efficiency of estrus synchronization and fertility in Mashona goat doses. Small Rumin. Res., 2001; 39: 283-288.
8. Langford, G.A., Marcus, G.J. and Batra, T. RT Seasonal effect of PMSG and number of insemination on fertility of progestagene treated sheep. J. Anim. Sci., 1983; 57: 307-312.
9. Langford, G.A., Marcus, G.J. and Batra, T. RT Seasonal effect of PMSG and number of insemination on fertility of progestagene treated sheep. J. Anim. Sci., 1983; 57: 307-312.
10. Mansour, M.M., Hamam, A.M., Hegazy, M.A. and Omyma, H.E. Effect of dietary energy on the superovulatory response to PMSG treatment, with special reference to PMSG treatment, with special reference to embryo quality, metabolic and endocrine response in Female goats. Egypt. J. Vet. Sci., 2000; 34: 77-101.
11. Mokhtari, M. Shariatie, M., Gharamanie, R. Effect of Trigonella Foenum graecum L seed extract on concentration of Testosterone and spermatogenesis in rats. J. Med. Plants. 2008; 7: 12-20:127.
12. Mothomelo, K. C., Greyling, J.P.C. and Schwalbach, L.M.J. Synchronization of estrus in goats: the use of different progestagen treatment. Small Rumin. Res., 2002; 22: 219-233.
13. Nagakura, T. Fenugreek (Trigonella foenum-graecum L.) farming Japan, 1975; 9(2): 41-48.
14. Randall, S., Otti, Nelson, D.R. and Hixon, F. E Peripheral serum progesterone and luteinizing hormone concentration goats during synchronization of estrus and ovulation with PGFza. AMJ. Vet. Res., 1980; 41: 1432.
15. Tahiliani, P. Kar, A. Mitigation of thyroxine –induced hyperglycaemia by two plant extracts. Phytother Res. 2003; 17(3): 294-6.
16. Thorburn, G.D. and Schneider, W. The progesterone concentration in the plasma of goats during the oestrus cycle and pregnancy. J. Endocrinol., 1972; 52: 23-56.