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LIST OF ABBREVIATIONS

B	Barki
BW	Body weight
CA-CLA	Calcium –salts of conjugated linoleic acid
CLA	Conjugated linoleic acid
CSFA	Calcium soaps of fatty acids
CSPO	Calcium salts of palm oil
DB	Domascus * Barki
DM	Dry matter
DMI	Dry matter intake
FCS	Fatty calcium salts
FFA	Free fatty acids
g	Gram (10^{-3} kilogram)
h	Head
HDL	High density lipoprotein
LCFA	Long chain fatty acids
LCSFA	Long chain saturated fatty acids
LCUFA	Long chain unsaturated fatty acids
LDL	Low density lipoprotein
MCFA	Medium chain fatty acids
MUFA	Medium unsaturated fatty acids
PUFAs	Polyunsaturated fatty acids
SCC	Somatic cells count
SCFA	Short chain fatty acids
SFA	Saturated fatty acids
SNF	Solid not fat
TG	Triglycerides
UFA	Unsaturated fatty acids
ww	Weaning weight

SUMMARY

This study was carried out at Borg El-Arab Research Station, Animal Production Research Institute, Agricultural Research Center- Ministry of Agricultural Dokki, Egypt. Two experiments were conducted in this study.

The first experiment: (Digestation experiment)

- Using three adult Barki bucks (B) and three adult cross (DXB) bucks on two digestation experiments to study the effect of addition fatty calcium salts on digestibiliteis coeffecents of nutrients and nutritive value of experimental diets.

The second experiment:

- Thirty multiparous Barki does (B) aging 3-5 years and weighing about 27 kg were used. Thirty multiparous Damascus X Barki crosses (DB) does aging 3-5 years and weighing about 30.4 kg were used.
- Every genotype were divided into three groups of ten does each.

A. First group (Control):
Does fed concentrate with out addition fatty calcium salts and rice straw.

B. Second group :
Does fed concentrate with fatty calcium salts (FCS) 80 gm/head/day before kidding by 6 weeks and rice straw.

C. Third group:
Does fed concentrate with fatty calcium salts (FCS) 80g/head/day after kidding by 2 weeks and rice straw.

Results obtained can be summarized as follow:

1- Total feed intake was higher in Damascus*Barki (D*B) does than Barki does (B). Also, feed intake was affected by fatty calcium salts (FCS) addition, where does consuming diets with (FCS) had lower rice straw intake; concentrate intake and total feed intake than control group. Also, the does treated after kidding was significantly higher than does treated before kidding in total feed intake.
2- Genotype had insignificant effect on digestibility coefficients of DM, OM, CP, CF, EE and NFE, while feeding goats on diets containing fatty calcium salts (FCS) had insignificant effect on digestibility coefficients of DM, OM, CP, CF and NFE, but there was significantly increased in the digestibility of EE as compared to the control diets.
3- The nutritive value expressed as TDN% of the experimental diets was significantly improved as a result of addition fatty calcium salts (FCS), while, The digestible crude protein (DCP%) was almost comparable for the two experimental diets indicating the absence of influence of fatty calcium salts (FCS) on crude protein (CP) digestibility.
4- D*B does produced more daily milk and total milk yield than Barki does at 7, 15, 30, 60, 90 and 120 days post kidding with significant differences.

5- Barki and its cross (D*B) does fed supplemented diets by FCS before or after kidding milked higher milk yield than those fed unsupplemented diets. The increases in milk yield were 8.04 & 5.91 (for Barki), 9.48 and 6.49% (for cross does) before and after kidding, respectively.
6- The genotype had significant effect on milk fat percentage but it had insignificant effect on protein, lactose, solid not fat and total solid percentage, also, addition of fatty calcium salts to the diets of does before or after kidding resulted in an increase in milk fat percent and total solid ($P<0.05$) but it had insignificant effect on protein, lactose and solid not fat percentage.
7- Regards milk lactose percent, it was lower for does supplemented with fatty calcium salts (FCS) than that of the control after one month from kidding. Milk lactose (%) of does fed unsupplemented diet (control) was higher by 4.90 and 9.31% than those of supplemented does before and after kidding, respectively. Differences were highly significant, however insignificant differences were found in milk lactose percentage among treatments for the rest months of lactation.
8- The genotype had significant effect in short chain fatty acid (C4:0, C6:0 to C8:0), while the short chain fatty acids were significantly decreased by feeding fatty calcium salts (FCS). They reached the peak at 2nd month of lactation for Barki and cross does.
9- Genotype had significant effect on medium chain fatty acid (MCFA). Where milk fat of Barki does had higher C_{10}, C_{12}, C_{13} than milk fat of cross does. However, milk fat of cross does had higher C_{14} than milk fat of Barki does. MCFA for Barki milk fat reached peak at 3rd month of lactation. While MCFA for milk fat of cross does reached the peak at 2nd month of lactation. Generally, MCFA were significantly decreased ($P<0.01$) by feeding fatty calcium salts (FCS).
10- Genotype had significant effect on Long chain saturated fatty acid (C15:0-C22:0) and Long chain unsaturated fatty acid (LCUFA) (from $C_{14:1}$ to $C_{22:1}$). Also, treatment was decreased significantly long chain saturated fatty acid except for C16:0 and increase significantly Long chain unsaturated fatty acid (LCUFA).
11- No significant differences were remarked between Barki does and their crosses with Damascus for SCC from the first month till the fourth month of lactation, but the SCC values were increased as lactation comes forward. Also, no significant differences were found by adding protected fat supplementation (FCS) for SCC.
12- Genotype had significantly effect on birth weight and live body weights of kids at 7, 15, 30, 60, 90 and 120 days (weaning weight). The results showed there was gradual increase in the average daily gain of the two genotypes through rearing period of kids were obtained. However a gradual increase in daily milk yield and average daily gain were observed during the suckling periods at 7, 15, 30 than at 60, 90 and 120 days post kidding.
13- The does fed diets supplemented with FCS produced heavier kids at birth than those fed unsupplemented diets, while genotype of does did not affected their body weights during pregnancy period and until 16 weeks after kidding.
14- Feeding diets containing fatty calcium slats (FCS) had no significant effects on weights of does during pregnancy period and at 2 weeks after kidding, but the loss in weights were significantly reduced at 4,8, and 16 weeks after parturition during the suckling period.

15- Genotype had no significant effect on plasma triglycerides concentrations before and after kidding periods. Its were higher for fat supplemented groups before kidding (17,19,21 weeks) and after kidding (4,8,12 weeks) periods. Also, the plasma total cholesterol concentrations (mg/dl) was significantly affected by addition of fatty calcium salts (FCS) to the diets before kidding (17,19,21 weeks) and after kidding (4,8,12 weeks) periods.
16- Genotype had no significant effect on plasma HDL and plasma LDL concentration (mg/dl). While the plasma HDL and plasma LDL concentrations (mg/dl) were higher for does fed diets containing fatty calcium salts (FCS) before kidding (17,19,21 weeks) periods and after kidding (4,8,12 weeks) periods.
17- The D*B does increased significantly in serum concentrations of AST but the Barki does increased significantly in serum concentrations of ALT. Also, blood serum concentrations of AST and ALT were significantly increased by addition FCS to the diets of does.

From the previous results it could be concluded that feeding dietary supplementation with fatty calcium salts (FCS) resulted in decreasing feed intake and improving nutritive value expressed as TDN%, digestibility coefficients of EE, the positive response in milk yield and decreasing somatic cells count during early lactation (SCC) for Damascus*Barki and Barki goats.

Addition FCS to the diets of goats markedly increased milk fat percent and total solids percent over the entire lactation period but there were no differences detected in other milk composition. FCS addition increased the proportion of polyunsaturated fatty acids in the milk fat and reduced the concentration of saturated fatty acids the consumption of which is considered a risk factor for cardiovascular disease. Polyunsaturated fatty acids (PUFAs) which have been associated with reduction the risk factor. Consequently addition FCS to the diets of goats alter the composition of goat milk fat to make it more suitable and healthy for human consumption. Addition FCS to the diets of goats resulted in heavier weights of their kids at birth and at weaning. Also, increased growth of kids. The loss in weights of dam were significantly reduced at 4, 8, 16 weeks after parturition by feeding diets containing FCS. The plasma triglycerides, total cholesterol, plasma HDL and plasma LDL concentrations (mg/dL) increased by feeding diets containing FCS.

In general, addition FCS with 75-100 gm/head/day was the best amount as shown in previous studies. FCS addition to goat's diets result in producing healthy milk and increase income of goats' breeders by selling heavier kids at weaning. Does had less losses in their weights after kidding and throughout lactation season as a result of FCS supplementation.