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Research article

Evaluation of the effect of partial and total replacement of Bekia seeds (*Vicia Sativa*) on the soybean meal in the cross breed Friesian dairy cows ration on the production of milk and its components, blood physiological and biochemical parameters

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Abstract

Three non-pregnant multiparous cross breed Friesian dairy cows were used in this study at same live weights and milk production at cow farm of Technical Agricultural College , Mosul .The cows were placed in individual pens and fed periodically by using Latin square design (3×3) with three period (30 days/ period) on three iso-nitrogen and iso-caloric experimental rations but different in percentages of bekia seeds (0, 3 and 6%). The results revealed that crude protein and metabolize energy intake, normal and adjusted milk yield , milk fat percentage, quantities of milk fat, protein and lactose were increased significantly ($P \leq 0.05$) in 3rd treatment (6% bekia seeds) as compared to those in the 1st treatment (0% bekia seeds). While the results indicated that using bekia seeds on three experimental treatments have no significant effect on feed intake of concentrate and straw, total feed intake, percentages of milk protein, lactose, solid not fat and total solid, physiological characters such as red and white cell counts, hemoglobin, packed cell volume, total protein, globulin, albumin, triglycerides, cholesterol, urea, blood glucose and concentrations of AST, ALT and ALP enzymes. It could be concluded that using bekia seed to totally substitute the soybean meal in the ration of dairy cows was improved milk production and fat percentage of milk and without a negative effect on all studied physiological blood parameters.

Key words: Bekia seed, Biochemical, Blood, Milk, Physiological.

Introduction

Use of concentrated feeds is important for the feeding of dairy cows to increase their nutrient requirements for food compounds that support this production (1). However, the use of concentrated feeds for feeding of dairy cows is increasing demands in some seasons of the year in our country as a result of lack or scarcity in the availability of coarse feed, especially during the seasons which suffered from rain, which leads breeder to almost total dependence on concentrated feeds instead of roughages crops (2),in addition to the expensive price of concentrated feed stuff is one of the most critical problems of animal production in Iraq and feed cost make more than 70% of total cost.As a result of a shortage of the traditional crops stocks resource ,that cause insufficient amounts to meet the need for increasing numbers of livestock in Iraq(3).This lead researcher in Iraq to investigated for using some non-traditional crops as high-value feed substitutes has contributed to filling the shortage of traditional feeds as agro-industrial by-product ,like sesame seed meals (4), and dried brewers grains (5) or using some local non-traditional fodder crops as high-value

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feed substitutes has contributed to filling the shortage of traditional feeds , like *Nigella sative* seed meal (6), and vetch seed (7) in feeding ruminants. Bekia plant *(Vicia Sativa L)* is commonly known as vetches ,is annual legume plants belonging to the genus Vicia, Pea family-Fabaceae (leguminosae).Fabaceae family contains about 140 species of flowering plants are distributed throughout the world ,about ten species of bekia plants are an important in agricultural around the world. Bekia plant is cultivated in Syria, Turkey, Bulgaria, Hungary and Slovakia (8).In northern Iraq, there are two types of bekia plants, the first type is known as *Vicia narbonensis* or narbon vetch, it is located in the areas of Shaklawa and Salah el-ddin regions in the Arbil governorate, the second type is known as *Vicia ervilia*, or ervil or bitter vetch it is located in the province of Sulaymaniyah governorate (9).Since 1992 - 1993, the seeds of the bekia were cultivated with barley in the low-rainfall areas of Nineveh governorate (10). Bekia plant is consider as legumes plants, it works to increase soil fertility by stabilizing nitrogen in the soil and tolerates the harsh and dry climate and improves the productivity of cereals especially barley, and to increase of high-value feeds that exploited to feeding farm animals (11).All types of bekia seeds are consider as palatable crops by farm animals ,it is highly nutritious with a high protein content up to28.56% and a metabolize energy up to14.69MJ/kg (12). There was no study for using the bekia seeds in the feeding of local dairy cows in the Iraq. This study was carried out to determine the effect of substitution different percentages of the bekia seeds instead of soy bean meal in rations for cross breed Friesian dairy cows on milk yield and composition and blood physiological traits.

Materials and Methods

Ethical approval

The Animal Ethical Committee of Veterinary Medicine College, University of Al-Qadisiyah, Iraq, has approved the present study under permission No: 386

1-Diet Preparation:

The seeds of bekia *(Vicia sativa)* were obtained from Division of Animal Resources (Al-Rashedia station), Agricultural Researches Department, Mosul. Nineveh Province. Before mixing the diets, three samples were taken from bekia seeds for chemical analysis according to (13) (table 1).After that three experimental rations(same iso-nitrogen and iso-caloric but different in percentages of bekia seeds ,0%, 3% and 6%) were prepared from different feedstuff that available in the cows farm of the Agricultural Technical College (table 2),and formulated to meet nutrient requirements of dairy cows (1). The chemical analysis of the three experimental components was analyzed in accordance with (13), as shown in table 2.Experimental rations were mixed biweekly and were sampled upon mixing to ensure consistency in their chemical composition.

Table (1): Chemical analysis (%) of Bekia seed and wheat straw

items	Bekia seed	wheat straw
Dry matter (DM)	91.83	93.26
Crude protein (CP)	26.11	2.95
Crude fiber(CF)	3.83	38.53
Ether extract (EE)	0.66	0.62
Crude ash	3.25	9.88
Nitrogen free extract (NFE)	57.98	41.18
Calculated metabolize energy ME * (M. cal./kg feed)	2.809	1.385

*** Calculated according to equation of (14)**

2-Feeding trail:

This work was carried out at cow's farm of animal production department in the Technical Agricultural College, Mosul/Iraq, from 10/12 /2013 to 10/3/2014 (4 months). Three Friesian dairy cows clinically healthy, multiparous cross breed, in good nutritional condition, at same live weights (365-385kg.) and milk production (7-8 kg) and during first month of lactation used. The cows was divided randomly into three groups and housed in the cow's barn, in a naturally individual pen (5×5 m) with cement floored,

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facility for individual feeding and watering, during the trail, all the animals were kept under natural photoperiod and ambient temperature. All animals were free from internal and external parasites before and during the study and their health, veterinarians evaluated status during the experiment period. Cows were assigned randomly into three experimental rations (table 2) and three periods (30 days each), each experimental period consisted of 9 days of adaptation to the diet and 21 days for data collection, between each experiment period, a wash out of 7 days was used. At the 2nd and 3rd periods diets were switched among themselves so that each cow was fed three diets at the end of experiment by using Latin square design method (3×3).

Feeding system:

Cows were fed individually on concentrate diets (table 2) at level of 2% of their live body weight to meet the maintenance requirements in addition to 1 kg. of concentrate diets /2.5 kg. milk producers to meet requirements of milk production (11).The concentrate diets were offered twice daily at 6:00 a.m. and 5. p.m. during milking periods, while wheat straw (2-3 cm) was offered to the cows in crib barn at level of 1.5% of their live body weight.In each barn,daily feed intake of rations and straw for each cows at three treatments of each experimental period were recorded, the mineral salt cubes were placed in each fold with water supplied to the animal's foreman. The experimental cows were weight at starting and at ending of each feeding intervals (30 days) by using electronic balance.

Milk analysis:

During the data collection period (21 days), cows were milked twice (06:30 a.m. and 05: 30 p.m.) daily by means of a milking machine, and milk yield were recorded daily for each cow during 21 days of collection period for each period for three treatments. The amount of daily milk yield calculated from cows by using following equation:- Total amount of daily milk (kg.)=amount of milk in the ring morning (kg.) + amount of milk in the ring evening (kg.)(15), also total amount of daily milk production was adjusted to fat corrected milk (4%fat) by using following equation:-fat corrected milk (4%fat)= total amount of daily milk production × 0.4+15(total amount of daily milk production × milk fat%)(2). Individual milk samples were obtained at days 20 and 21from each cow of each experiment- al period for three treatments according to (16), immediately after each milking, the samples (10% of production) were collected. Also the sample of each cow were collected at two consecutive (morning and evening) milking, mixed in proportion to yield appropriate composted samples in order to overcome the problem of disagreement ratios components of milk between the morning and evening milking. The process were repeat again on the second day for two models of milk for chemical analysis. Milk samples were taken for pH determination by using pH meter and milk samples were analyzed to determine the milk composition for fat, protein lactose, ash and solid not fat by using a Milko-scan analyzer (EKO Milk, Total Ultrasonic, Milk Analyzer, Finland).

Blood sampling and analysis:

Blood samples were individually collected from each cow of each experimental period for three treatments on day 30 (end of periods) after the morning feeding (4 hours) via jugular vein using a 10 ml plastic disposal syringe. About 10 ml of blood were obtained from each cows by using two tubes. The first 5ml of the blood was put in vacationer tubes containing Ethylene Diamine Tetra Acetic Acid (EDTA) ,the tubes were inverted several times to ensure adequate mixing of the blood with anticoagulant and transported immediately to the laboratory for hematological analysis, the hematological analysis included ,total of erythrocytes (RBC's $\times 10^{6}$ cells/ul)and leukocytes(WBC's$\times 10^{3}$cells/ul) counts were determined manually by using the Hemolytic-meter as described by (17), also the differential distribution of leukocytes was determined by counting 100 cells per slide using the method described by (17) and expressed as a percentage

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(%), hemoglobin concentration (Hb,g/dl) and packed cell volume (PCV%) were estimated according to (18). The mean corpuscular hemoglobin concentration (MCHC, Mg/dl), the mean cell volume (MCV,Fl) and the mean corpuscular hemoglobin (MCH, Pg.) were calculated by the equations citied by (19). The second 5 ml of the blood put in non-heparinized glass tubes, blood samples were immediately placed on ice and then centrifuged at $4C^0$ for 15 minutes at 4000 rpm, and the obtained serum samples were stored at $-20C^0$ until biochemical analysis. These samples were used to determine the total protein (T.P), albumin (AL), globulin (GL), glycerol (G), triglycerides (TG), urea blood (BU) and blood glucose (BG) in serum by using commercial kits (Biolabo Meriex, France) according to the procedure outlined by the manufacturer and by automatic spectrophotometer. In addition, Aspartate amino transferase (AST) and Alanine amino transferase (ALT) enzymes activities in the serum were determined according to (20) and Alkaline Phosphatase (ALP) measured according to the procedure outlined by the manufacturer by an automatic spectrophotometer.

Statistical analysis:

Data were statistically analyzed using GLM procedure of SAS (21) as 3×3 Latin square design with the following mathematically model: $Y_{ij\ (k)} = \mu + P_i + Y_j + T_k + e_{ijk}$ when, $Y_{ij(k)}$ = value of observation which is beyond to treatment (k) that found in row (i) and column (j)μ = Overall mean. P_i = effect value of row (i), which is represent a feeding period (i=3). Y_j = effect value of column (j), which is represent animal group (k=3). T_k = effect value of the treatment (k), which represent the percentage of sesame seed meal. e_{ijk} = Random experimental error of the unit test ,which is distributed normal and independent with an average of zero and the contrast to $\sigma^2 e$. The results are presented as mean values and standard error of the mean. Differences between treatment means were determined by Duncan's multiple Range Tests (22). Differences among means with $P \leq 0.05$ accepted as representing statistically significant differences.

Table (2): Feedstuffs (gm. /kg. feed) and chemical analysis (%) of experimental rations

Feedstuffs (gm./kg. feed)				Chemical analysis (%)			
Ingredients	Treatments			Items	Treatments		
	T1	T2	T3		T1	T2	T3
Barley grain	350	350	350	Dry matter (DM)	92.23	94.11	93.96
Wheat bran	400	400	400	Organic matter (OM)	94.35	94.27	94.34
Yellow corn	80	80	80	Crude protein (CP)	17.01	17.07	17.18
Soy bean meal (44%)	60	30	-	Ether extract (EE)	1. 62	1.48	1.41
Bekia seeds	-	30	60	Calculated Crude fiber (CF)	5.51	5.79	5. 93
Ground rice	80	77.5	75	Crude ash	3. 43	3. 78	3. 69
Urea(42% N)	10	12.5	15	Calculated metabolize energy ME. (M. cal./kg feed) *	2.689	2.688	2.685
NaCl) (Salt	10	10	10				
Limestone($Caco_3$)	10	10	10				

*** Calculated according to equation of (14)**

Results

Data in table (3) clearly indicated that daily intake of concentrate rations, straw and total feed were increased mathematically in 2nd (3% bekia seed) and 3rd (6% bekia seed) treatment respectively as compared with 1st treatment (control ration only) ,the average daily intake of concentrate rations was 7.87, 9.11 and 9.53 Kg., for straw was 2.89, 3.54 and 3.71 Kg. and total feed was 10.76, 12.65 and 13.24 Kg./cow/day for three treatments respectively, so the increment in the daily total feed intake was 1.89 and 2.48 kg. which mark 17.57% and 23.05% in 2nd and 3rd (6% bekia seed) treatment, respectively as compared with 1st treatment. This reflect on increasing significantly ($P \leq 0.05$) the protein and energy intake in 3rd treatment as compared with 1st treatment .While no significant differences was found between 2nd and 3 rd treatments in daily intake of protein

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(1.66 and 1.75 kg/cow/day) and metabolize energy (2.94 and 3.07 M. Cal /cow/day), respectively. In addition, the data in table (3) indicate that no significant effect from using bekia seed in the rations on live weight of dairy cows during all experimental periods. Data in table (4) revealed that feeding T3 (6% bekia seed) had caused a significant (P≤0.05) increased in the uncorrected and corrected (4% FCM) milk yields and feed efficiency ratio to the production of one kg of uncorrected and corrected (4% FCM) milk as compared with T1 (control ration) only(table 4).In other world ,feeding 6% bekia seed ration in T3 had increased significantly (P≤0.05) the uncorrected and corrected (4% FCM) daily milk yield by 3.06 kg. and 4.03 kg, which caused increasing percentage by 27.95% and 35.82%, Respectively as compared with production of cows fed T1(control ration) ,also feeding T3 (6% bekia seed) had increased mathematically the uncorrected and corrected (4% FCM) daily milk yield by 1.17 kg. and 1.63 ,which caused increasing percentage by 10.68% and 14.49% ,respectively as compared with production of cows fed T2 (3% bekia seed). The data of milk composition and quantity of milk composition of the experimental treatments are also summarized in table (4).These data revealed that percentage of milk fat and daily quantities of fat, protein and lactose yields were increased significantly (P≤0.05) for milk cows that fed T3 as compared with cows fed T1.Although milk pH and the percentages of milk protein , lactose, total sold not fat, total solid and ash were not significantly affected by using bekia seed (0% , 3% and 6%) in the rations**.** Results of blood hematological parameters analysis are present in table 5. No significant treatment effect was observed for any of studied parameters, blood pH, total of erythrocytes (RBC's×10 ^{6}cells /ul) and leukocytes (WBC's×10^{3} cells/ul) counts, hemoglobin concentration (Hb,g/dl),packed cell volume(PCV%),the percentages of lymphocyte, eosinophils, neutrophils, monocytes, basophils cells, the mean corpuscular hemoglobin concentration (MCHC, Mg/dl), The mean cell volume(MCV,FI) and the mean corpuscular hemoglobin (MCH, Pg.). The data of some blood biochemical parameters of the experimental treatments are summarized in table 6. The values of total protein, globulin, albumin, cholesterol, triglyceride, glucose, and urea, AST, ALT and ALP were not significantly affected by feeding different percentages bekia seeds in the cow's rations. The values of total protein, globulin, albumin, cholesterol, triglyceride and blood glucose were mathematically higher ,while the values of blood urea was mathematically lower in treatments T2 and T3 as compared with treatment T1.

Table (3): Effect of using different percentages of bekia seed on some performances traits of dairy cows (Mean ± standard error)

Treatments / Studied traits	T1 (0% bekia seed)	T2 (3% bekia seed)	T3 (6% bekia seed)
Concentration feed intake(kg/cow/day)	7.87 ± 1.41	9.11 ± 1.29	9.53 ± 2.12
Straw intake(kg/cow/day)	2.89 ± 0.33	3.54 ± 0.47	3.71 ± 0,53
Total feed intake(kg/cow/day)	10.76 ± 1.64	12.65 ± 2.19	13.24 ± 2.45
Total protein intake(kg/cow/day	1.44 ± 0.12 b	1.66 ± 0.16 ab	1.75 ± 0.19 a
Total metabolize energy intake (M. Cal /cow/day)	2.51 ± 0.28 b	2.94 ± 0.35 ab	3.07 ± 0.41 a
Weight of dairy cow at beginning experiment (kg.)	373	377	365
Weight of dairy cow at ending experiment (kg.)	379	385	374

***Means in the same row bearing different letters that different significantly with different at P≤0.05**

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Table (4): Effect of using different percentages of bekia seed on milk yield and composition (Mean ± standard error)

Treatments / Studied traits	T1 (0% bekia seed)	T2 (3% bekia seed)	T3 (3% bekia seed)
yield(kg/cow/day) Daily milk			
uncorrected milk	7.89 ± 1.86 b	9.78 ± 2.61 ab	10.95 ± 2.95 a
corrected milk (4%FCM)	7.22 ± 1.33 b	9.62 ± 2.52 ab	11.25 ± 3.13 a
feed efficiency (kg. feed intake / kg. milk)			
uncorrected milk	1.36 ± 0.30 b	1.29 ± 0.20 ab	1.21 ± 0.20 a
corrected milk (4%FCM)	1.49 ± 0.60 b	1.31 ± 0.40 ab	1.18 ± 0.20 a
Milk composition (%)			
Milk pH	6.46 ± 0.12	6.53 ± 0.14	6.61 ± 0.16
Fat	3.43 ± 0.27 b	3.89 ± 0.38 ab	4.18 ± 0.42 a
Protein	3.36 ± 0.08	3.37 ± 0. 11	3.39 ± 0.14
Lactose	4.84 ± 0.24	4.75 ± 0.20	4.63 ± 0.18
Ash	0.73 ± 0.07	0.74 ± 0.09	0.74 ± 0.10
Total solid	12.36 ± 0.45	12.75 ± 0.42	12.94 ± 0.31
Total solid not fat	8.93 ± 0.29	8.86 ± 0.26	8.76 ± 0.23
Quantity of Milk composition(gm.)			
Fat	270.63 ± 25.34 b	380.44 ± 33.17 ab	457.71 ± 42.61 a
Protein	265.10 ± 24.32 b	328.61 ± 29.04 ab	371.25 ± 31.58 a
Lactose	381.88 ± 33.38 b	464.55 ± 45.84 ab	506.99 ± 51.29 a

***Means in the same row bearing different letters that different significantly with different at P≤0.05.**

Table (5): Effect of using different percentages of bekia seed on blood physiological parameters (Mean ± standard error)

Treatments / Studied traits	T1 (0% bekia seed)	T2 (3% bekia seed)	T3 (3% bekia seed)
Blood pH	6.7 ± 0.10	6.9 ± 0.11	6.9 ± 0.12
Hb(g/ dl)	9.67 ± 0.19	9.71 ± 0.22	9.69 ± 0.21
RBC's (×10 ^{6} cells/ul)	10.53 ± 0.32	10.57 ± 0.35	10.54 ± 0.38
PCV (%)	29.88 ± 0.32	29.95 ± 0.40	29.91 ± 0.41
PL's (× 10 ^{3} / ul)	0.42 ± 0.06	0.41 ± 0.07	0.40 ± 0.07
MCHC (Mg/dl)	28.37 ± 0.47	28.33 ± 0.41	28.38 ± 0.47
MCV(FI)	9.18 ± 0.18	9.17 ± 0.18	9.19 ± 0.18
MCH(Pg.)	32.36 ± 1.44	32.29 ± 1.47	32.29 ± 1.47
WBC's(× 10 ^{3} cells/ ul)	9.93 ± 0.28	9.98 ± 0.29	9.92 ± 0.26
Lymphocytes cells (%)	52.81 ± 3.45	52.72 ± 3.45	52.63 ± 3.19
Eosinophils cells (%)	9.89 ± 1.89	9.91 ± 1.89	9.92 ± 1.89
Neutrophils cells (%)	31.47 ± 1.25	31.58 ± 1.25	31.61 ± 1.25
Basophils cells (%)	0.88 ± 0.06	0.87 ± 0.06	0.87 ± 0.06
Monocytes cells (%)	4.95 ±0.58	4.92 ±0.58	4.97 ±0.58

Table (6): Effect of using different percentages of bekia seed on blood biochemical parameters (Mean ± standard error)

Treatments / Studied traits	T1 (0% bekia seed)	T2 (3% bekia seed)	T3 (3% bekia seed)
Total protein(g/dl)	8.45 ± 0.21	8. 63 ± 0.24	8.67 ± 0.25
Globulin(g/dl)	4.51 ± 0.13	4. 66 ± 0.15	4.69 ± 0.16
Albumin(g/dl)	3.94 ± 0.20	3.97 ± 0.23	3.98 ± 0.23
Cholesterol(g/dl)	121.96 ± 4.21	125.87 ± 4.45	127.96 ± 4.56
Triglyceride(mg/ dl)	31.34 ± 2.68	35.78 ± 3.21	38.19 ± 3.38
Urea (mg/ dl)	47.77 ± 0.67	45.68 ± 0.81	41.34 ± 0.87
Glucose (mg/ dl)	60.33 ± 3.11	61.67 ± 3.56	61.92 ± 3.67
AST(Units/ml)	8.96 ± 1.18	9.21 ± 0.87	9.27 ± 0.89
ALT(Units/ml)	3.87 ± 0.63	4.17 ± 0.76	4.25 ± 0.76
ALP(Units/ml)	35.74 ± 1.89	35.97 ± 2.11	36.11 ± 2.28

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Discussion

The mathematically increase in the daily intake of concentrate ration , straw and total feed in T2(3% bekia seeds)and T3(6% bekia seeds) respectively, as compared to T1,which caused the significant (P≤0.05) increase in the daily intake of crude protein and metabolize energy in T3 as compared to T1(table 3),this may be due that bekia seeds enhancing the appetite of animal and improvement the nutrients palatability which finally caused increased of concentrate intake, or may be attributed to that bekia seed improved the coefficient of crude protein digestion (7), or perhaps is due to the significant (P≤0.05) variation in the level of production of daily milk. These result are agreed with those obtained by (7), who they reported that no significant effect of feeding different percentages of bekia seeds(10,20 and 30%) on daily intake of concentrate ration for fattening Awassi lambs as compared to those in basal ration. The present study showed that cows fed different percentages of bekia seeds (3 and 6%) had similar finial weights as compared to cows fed control ration at the end of experiment period (table 3),which mean that rations were assessed to cover the maintenance and production requirements for each animal (11)during three periods and without adverse effect on the live weight of dairy cows during experimental periods. The significant (P≤0.05) increase in the uncorrected and corrected (adjusted milk yield at 4% fat) milk yields that produced from cows fed bekia seed in T3(6%) as compared to those in T1(table 4),this may be due to a significant (P≤0.05) increased in the total intake of crude protein and metabolize energy for cows fed T3 (6% bekia seed) as compared to those fed T1.(basal ration) , or perhaps due to increased energy intake had a positive effect on significantly increased in milk yield (23). The significant(P≤0.05) increase in milk fat percentage of cows, fed T3(6% bekia seed) as compared to those in T1(table 4), may be due to the positive effect of the fiber that found in the bekia seeds, which results in prolongation of food inside the animal body and absorption of nutrients and thus representing a section of food to milk fat (20),or perhaps due to the fact that the cows fed T3 have consumed larger amounts of fiber, as the proportion of fat in milk depends mainly on the level of production of acetic and butyric acids in the rumen of cows, which are an excellent source of Acetyl COA, which is consider as good compound for the preparation of milk fat ,while acetic acid is consider essential fatty acid for the formation of milk fat (24).Thus enhancing the Denovo pathway(an alternative pathway used for the manufacture of fatty acids, especially when cows are fed large amounts of concentrated diets and small amounts of coarse feed, linolenic acid enters another alternative pathway from the normal fatty acid pathway to formulated fatty acid trans-10, cis-12CLA, where they make up about 60% of the manufacture of fatty acids that are fat in the cow family, and thus will lead to an increase in the proportion of production of acetic acid: propionic acid, which reflected positively on the increase in the proportion of milk fat (25).While The significant(P≤0.05) increase in the daily quantities production of fat, protein and lactose in the milk of cows fed T3 as compared with those fed T1 (table 4),may be due to a significant increasing the intake of metabolize energy has caused a significant increase (P≤0.05) in production of quantities of milk content (25 and 26). The absence of a significant effect from the use of bekia seeds on blood physiological parameters (table 5)such as blood pH, total of erythrocytes (RBC's $\times 10^{6}$ cells /ul) and leukocytes (W BC's$\times 10^{3}$ cells/ ul) counts, hemoglobin concentration (Hb, g/ dl), packed cell volume (PCV%). the percentages of lymphocyte eosinophils, neutrophils ,monocytes, basophils cells, the mean corpuscular hemoglobin concentration

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(MCHC, Mg/dl), The mean cell volume (MCV,FI) and the mean corpuscular hemoglobin (MCH ,Pg.),may be attributed to the result of interference in many physiological and environmental factors together (27),or perhaps due to the fact that the weight of the cows was not affected by the treatments that containing different percentages of bekia seeds, which was reflected in the absence of a significant effect in the blood physiological parameters(28). The computational rise in the value of total protein in 3rd treatment as compared to 1st treatment(table 6) may be attributed to that using bekia seed improve the digestibility crude protein (7)or may be due that there was appositive correlation between dietary protein and plasma protein concentration (29).While the arithmetic elevation in blood urea values in the 1st treatment as compared to 2nd and 3rd treatments ,perhaps due to the pH elevation of the rumen fluid may have caused an increase in the activity of the bacteria that analyzed the protein, which reflected positively on the increased the concentration of ammonia after nutrition feeding in blood serum. (24). The absence of a significant effect from the use of bekia seeds on the effectiveness of AST, ALT and ALP enzymes (table 6) ,may be due to the fact that the cows were in good health and under good veterinary control during the study period and that the presence of AST and ALT enzymes was considered as a sign of stress in the animal liver when an animal disease results from damage to the liver, these enzymes are released from the liver to the blood and their blood levels rise (30). The study concluded that the use of the 6%bekia seeds instead of total replacement of soybean in dairy cow diets had improved the amount of milk produced, the quantity and the fat percentage, but did not negatively affect all the studied blood parameters and without adverse effect on the animal health and however further studies are needed in this aspect.

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