Performance, Carcass Characteristics and Blood Biochemicals of Barki Lambs Fed Complete Diets Containing some Desert Shrubs

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ABSTRACT

Thirty six Barki lambs (average weight 26.5kg) were equally and randomly allotted to four dietary groups (9 lambs each) with three replicates per group. The diets comprised a whole mixed control diet containing clover hay (C) and three diets, namely *Atriplex nummularia* (At), *Acacia saligna* (Ac) and mixture types of *Atriplex* and *Acacia* (At + Ac) where kinds of *Atriplex* and *Acacia* incorporated to replace the clover hay of control diet. After 70 days of feeding, 12 lambs, 3lambs from each dietary group, were randomly selected, fasted for 18 hr and slaughtered.

The results indicated that lambs fed diets containing *Atriplex* or *Acacia* insignificantly had higher daily gain and better feed conversion than those fed the control diet. Percentage of dressing weight, full gut, pelt weight, mesentery weight and lung weight were significantly affected by feeding these two types of shrubs. Physical composition of the carcass best ribs (9-11 ribs) and the chemical composition of their soft tissue did not affected by introducing *Atriplex* and *Acacia* instead of clover hay in the diets except for crude protein percentage which significantly decreased in lambs fed diets containing *Acacia* or *Atriplex* and *Acacia* . Data showed that partial substitution (50%) of clover hay by *Atriplex* resulted insignificant decrease in blood concentration of cholesterol and low density lipoprotein (LDL). Blood urea was increased ($P<0.05$) as a result of feeding lambs on diets containing *Atriplex* and *Acacia*.

These results revealed that *Atriplex nummularia* and *Acacia saligna* can be partially (50%) replace clover hay in the diets of growing lambs.

Key Words: *Atriplex*, *Acacia*, performance, carcass characteristics, blood biochemical, Barki lambs

INTRODUCTION

To mitigate the shortage of feeds and fodders and to make animal production profitable, efforts have been made on improvements the utilization of shrubs. Among the various shrubs, *Atriplex* spp. and *Acacia* spp. are available in appreciable quantities in several countries of the world and can form a roughage source for the ruminants. *Atriplex* and *Acacia spp.* remain green even during droughts and maintain a relatively high

crude protein content throughout the year (Devendra, 1989). Feeding shrubs such as *Atriplex* spp., *Acacia* spp. is a feasible solution to minimize the problem of feed and water shortage especially in arid and semi arid regions (Nfzaoui, 1997, Ben Salem *et al* 2002a). The general nutritional characteristics of these shrubs have been well defined (reviewed by Gihad and El-Shaer 1994). Nutrient composition varies by species, plant part, stage of maturity and salinity of the irrigation source (Swingle *et al* 1996).

Desert shrubs usually containing sufficient crude protein and (or) carbohydrate components to have significant nutritional potential. However, the typically high content of minerals (much of which is NaCl) compromises the usefulness of desert shrubs (Benjamin *et al* 1992). *Atriplex spp.* can be planted is saline soils, have low water requirement and can play an important role in semi arid environments in many areas of the world. The plant can be utilized as a main or secondary source of feed in periods when the availability of conventional forage is low (Alicate *et al* 2002). *Acacia* is also a fast growing species, which can maintain active growth during the dry season. The content of crude protein in *Acacia* foliage is relatively high, thought it has been used for goat and sheep feeding in different research works (Kandil *et al* 1996).

Generally most of these shrubs have low energy content (Khatab 2000, Ben Salem *et al* 2002a). For th5is reason and to increase the utilization of these shrubs animals should be given an energy supplement such as barley grains (Bahati 2009) or introducing it with some concentrate ingredients as a complete or mixed diets (Al-Owaimer *et al* 2008). There are a number of reports in literature studied the growth performance of sheep fed on desert shrubs such as *Atriplex* or *Acacia* (Wilson 1966, Abou El-Nasr *et al* 1996, Ben Salem *et al* 2002a). By contrast, few reports have been published on carcass characteristics and meat quality of lambs fed on desert shrubs either alone or supplemented with other source of nutrition. Hopkins and Nichols on (1999) reported that feeding *Atriplex spp.* to lambs had no effects on meat quality. Finishing lambs on *Atriplex* either supplemented with hay or grains did not present any apparent meat quality problems compared to Lucerne feed lambs (Aganga et al 2003). Maharem *et al,*(2002) reported that there was no effect of feeding *Acacia* spp. to lambs on carcass cuts and overall acceptability. Therefor the objective of this study was to evaluate the effect of feeding two kinds of shrubs (*Atriplex nummularia* and *Acacia saligna*) in complete diet on growth performance, carcass characteristics and some blood parameters of Barki lambs.

MATERIALS AND METHODS

A) Animals and feeding trials:

A total of 36 Barki lambs with 7-8 months and 26.5kg body weight in average were used to investigate the effect of feeding two types of shrubs (*Atriplex nummularia* and *Acacia saligna*) on sheep performance and carcass characteristics. Before beginning the experiment lambs were treated against internal and external parasites and entero-toxemia. Animals were divided according to the body weight into four treatment groups with nine lambs per group. Lambs of each group were equally divided at random into three replicates; each replicate was housed in a concrete floored pen in an open sided building. Lambs were fed randomly on four experimental diets, control diet which containing 30% clover hay with 70% concentrate ingredients, while other three diets were *Atriplex* 15% diet on which contained 15% clover hay + 15% *Atriplex*, diets *Acacia* 15%which contained 15% clover hay +15% *acacia* and diet *Atriplex* 15% + *Acacia* 15% which did not contain clover hay with concentrate ingredients. The experimental diets were prepared as a complete diet, the proximate analysis of the three forages (clover hay, *Atriplex* and *Acacia*) which used in formulation of experimental diets were determined according to AOAC (2000) as shown in table (1) and (2) respectively. Four representative feed samples were taken from the dried composite for each treatment collected during the experiment for further analysis (3x4). These samples were grinded and used for approximate analysis according to AOAC (2000).

The feeding experiment lasted for 70 days to determine feed intake, daily gain and feed conversion ratio. At the end of feeding experiment 12 lambs (three lambs from each treatments) were randomly selected for determine carcass characteristics.

B) Slaughter procedures:

Twelve Lambs were fasted for 18 hrs shrink and slaughtered in commercial abattoir. Live body weight was obtained for all lambs at the time of slaughter, the hot carcass weight was determined immediately after dressing and removing organs, head, legs, lungs, hide, heart, liver, full and empty digestive tract were weighed. Thereafter best ribs the 9-11th rib joint was separated from the right side of each carcass and physically analyzed to meat, fat and bone. Meat samples were ground through a 4mm plates for animals from each treatment mixed and reground again. After that 30-

40gm from mixed samples was placed in plastic bag frozen and stored at – 20°C for chemical analysis.

Samples were analyzed for moisture, ash, ether extract and crude protein according to AOAC (2000).

C) Blood analysis:

Blood samples were collected from lambs two times during the whole experimental period, the first at the 35th day of the experiment and the second at the last day of the experiment (70th day). Samples were withdrawn from jugular vein of the animal at morning before access to feed and water. Serum was separated and stored at – 20 C° until used for analysis. Serum glucose, cholesterol, low density lipoprotein (LDL), high density lipoprotein (HDL), urea, total protein (TP), and albumin were measured using bio-Merioux kits (France). Serum globulin was then obtained by subtracting albumin from TP and albumin: globulin ratio was calculated.

D) Statistical analysis:

Data were statistically analyzed by ANOVA using GLM procedures (SAS, 2000). Duncan's multiple range tests was used to test for significant differences among means (Duncan 1955).

RESULT AND DISCUSSION

The chemical composition of forages used in complete diets:

The chemical composition of clover hay and two types of desert shrubs (*Atriplex nummularia* and *Acacia saligna)* used in this study are presented in Table (1). The results showed that Acacia contained 17.63% crude protein while Atriplex contained 18.91% crude protein. These values are in agreement with findings of different authors, Ahmed *et al*; 2001, Shawket (1999), Ben Salem *et al*; (2004), Hassan *et al* (1979) and Khalil *et al* (1986). They reported that crude protein in Atriplex spp. ranged from 13.9% to 25.2%. El-Shaer et al (1984); Maharem *et al*; (2002) and (2004), working on *Acacia spp.* they found the same chemical composition as that in our results. Crude fiber of the two types of shrubs (*Acacia* and *Atriplex*) used in this experiment were 22.81% for *Acacia* and 26.76% for *Atriplex*. Shawket and Ahmed (2001) showed that *Atriplex* contained 26.9% CF while Maharem *et al* (2004) reported that *Acacia* contained 17.83%CF.

Data of this study showed that ash content was 10.67% for *Acacia* and 11.67% for *Atriplex*. These values of ash are within the range reported by Aganga *et al* (2003), Maharem *et al* (2002) and (2004).

The differences in chemical composition for desert shrubs could be due to different species, stage of growth, season, soil composition and other environmental factors.

Lambs performance:

Table (3) present the consequences of the effect of feeding *Atriplex nummularia, Acacia saligna* and their mixture on live body weight, ultimate body weight, daily gain, dry matter intake and feed conversion ratio of Barki lambs.

Initial body weight of Barki lambs ranged from 26.00 to 26.50 Kg with no significant differences among treatments, which means a random distribution of the lambs on the different treatments. Results indicated that ration of different content of *Atriplex* and/ or *Acacia* had no significant effect on animal body weight and daily dry matter intake. However, lambs fed diet *Atriplex* 15% had 6.35% heavier final body weight than those fed the control diet. This results was in agreement with those reported by Swingle *et al* (1996) and Al-Owaimer *et al*;(2008). The highest dry matter intake was observed in lambs fed on diet *Atriplex 15%* followed by control group and diet *Acacia 15%*. Generally, increased dry matter intake was observed with the inclusion of *Atriplex nummularia*15 % in the diets. Supplementation of *A. nummularia* with an energy source tended to increase intake du Toit *et al* (2004). Likewise, similar results were reported by Al-Shorepy and Alhadrami (2008). Degen *et al.*, (1997) reported that intake of *Acacia saligna* and *Acacia salicina* as sole fodder particular young trees were low, and both goats and sheep lost body mass and were in negative N- balance. Abu-Zanat (2005) reported that inclusion of *Atriplex nummularia* in the diet up to 50 % instead of alfalfa hay had no significant effect on dry matter intake, whereas the inclusion of *Atriplex halimus* above 25 % reduced dry matter intake.

Data of Table (3) revealed that, differences in daily gain were significantly due to different treatments. Groups of lambs fed diet *Atriplex 15%* plus *Acacia 15%* had significantly ($P \leq 0.05$) the lowest values of daily gain, while the group fed diet *Atriplex 15%* recorded the highest value of daily gain followed by group fed diet *Acacia* 15% than group fed control diet with no significant differences between them.

The decrease in daily gain which observed in lambs fed diet containing 15% *Atriplex* plus 15% Acacia may be attributed to the decrease in dry matter intake when lambs fed this diets (Table, 3).

Significant differences in feed conversion ratio were detected among the studied diets. The best value was recorded for the lambs fed diet *Atriplex* 15% while the worse feed conversion ratio (FCR) was recorded for lambs fed diet *Atriplex* 15% plus *Acacia* 15%. This may be due to that *Atriplex* and *Acacia* contain high salts and tannins that reduce nitrogen digestibility and thus cause reduction of growth (Kummar and Mello, 1995). These results are in harmony with those obtained by Abou El-Naser (1996) and Abdou (1998).

Slaughter characteristics:

Data concerning the effect of feeding Barki lambs on complete diets containing 15% *Atriplex* or 15% *Acacia* or 15% *Atriplex* plus 15% *Acacia* on their carcass characteristics are shown in Table (4). The percentages of dressing weight, full gut weight, pelt weight, mesentery weight and lung weight of lambs fed the experimental diets were significantly affected by different treatments. It is obvious that lambs fed diet *Atriplex* 15% plus *Acacia* 15% had higher ($P<0.05$) dressing percentage than other treated groups and followed by control groub with insignificant difference between them. In the same trend, Abdul Aziz *et al,* (2001) found that dressing percentage of lambs was significantly improved with the inclusion of Acacia silage with concentrate mixture had no significant effect on dressing percentage of sheep. Similar result was stated by Al-Owaimer *et al,* (2008) on sheep fed complete diets containing some *Atriplex* species. Lambs fed diet *Atriplex* 15% and diet *Atriplex* 15% plus *Acacia*15 had higher ($P<0.05$) percentage of pelt weight than other feeding groubs. In this respect, Khatab (2000) found that dressing percentage and pelt percentage of growing Barki lambs did not affected by feeding on fresh *Atriplex Halimus* and fresh *Acacia saligna* with different sources of energy. Data of Table (4) indicated that there were no significant differences between treatments in the percentage weight of head, liver, heart, heart fat and spleen whereas, a significant effect due to treatments found in percentage weight of lung and mesentery. The highest value of lung percentage was recorded for lambs fed diet *Acacia* 15% followed by those fed diet *Atriplex* 15% then lambs fed control diet with insignificant differences between them. However, lung percentage significantly decreased in lambs fed complete diet containing 15% *Atriplex* plus 15% *Acacia*. The previous results were in accordance with finding of Al-Owaimer *et al.*, (2008) who, reported that percentage

weights of head, heart, liver and kidney were not affected by feeding sheep on diets containing *Atriplex* spp. As compared to control diet, whereas the lung percentage was higher in *Atriplex* fed group. Results of Table (4) indicated that feeding Barki lambs on diet containing 15% *Aaccia* decreased ($P<0.05$) mesentery (%) as compared with those fed diet containing 15% *Atriplex* plus 15% *Acacia*. However, there were non significant differences in mesentery percentage between lambs fed the control diet and those fed the experimental diets.

Physical composition of the 9th, 10th, 11th rib cut:

There were no significant difference in weights of best ribs, meat, subcutaneous fat, and fat between muscles, total fat, and bone of Barki lambs due to feeding them on complete diets containing *atriplex* and *acacia* (Table 5). Meanwhile, best ribs weight and their meat weight of sheep fed diet Atriplex 15% insignificantly exceeded those of the other treatment. These results agree with those obtained Abdelhamid *et al.* (2007). The total fat of the best ribs of lambs fed the experimental diets were insignificantly higher than that recorded for lambs fed control diet. Abdul Aziz *et al.* (2001) reported that eye muscle area was not significantly affected by introducing halophytic silage with non conventional energy source in the fattening diet.

Meat chemical composition:

Dry matter, Protein, ether extract, and ash of lambs' meat are shown in Table (6). The protein (%) of the control and *Atriplex* groups were significantly ($P< 0.0001$) higher than other experimental diet groups. However, dry matter, ether extract, ash not significantly differ as a result of partial or complete substitution of clover hay with *Atriplex* and/ or *Acacia* in complete diets; however, this result agree with that reported by Khatab (2000).

Biochemical blood parameter:

The effect of experimental diets on blood serum total protein, albumin (A), globulin (G), A/G ratio, cholesterol, low density lipoprotein (LDL), high density lipoprotein (HDL), urea and glucose are presented in Table (7). Values of total protein, albumin, and globulin and A/G ratio for lambs were not affected significantly with different treatments. It indicated that animals did not suffer from any health problems that might affect the performance of the experimental animals. Similar results were obtained by El-Ashry *et al.* (2001). However, Abdelhamid *et al* (2007) reported that serum protein fractions of animals fed biologically treated halophyte

mixtures (dried *Acacia saligna* treated with *P.florida* + dried *Tamarix mannifera* treated with *P.ostriatus*) were nearly similar values with no significant effect compared with untreated ration. It is important to note that all values of A/G ratio were higher than 1.00, which indicated that animals did not suffer from any health problems that might affect their performance (El-Sayed *et al.*, 2002). Results indicated that feeding *Atriplex* 15% in complete diet significantly (P< 0.05) decreased serum cholesterol as compared to control diet. These results are in harmony with those obtained by Jensen *et al* (1997) and Maharem *et al* (2004). They found that inclusion different levels of fiber lowered the level of cholesterol in the serum, liver, and aorta, but it elevated body cholesterol levels. Blood low density lipoprotein (LDL) of lambs were significantly (P< 0.05) decreased by feeding *Atriplex* 15% as compared to the other treatments followed by those feeding *diet Acacia* 15% in the form of complete diets, reductions in mean plasma total and low-density lipoprotein cholesterol concentrations by Christopher et al (1997).

The differences in blood urea (mg/ dl) concentration between the control group and the experimental treatments were significant (P< 0.05). However , no significant differences among the experimental treatments were observed, which agree with results obtained by Khatab (2000).

CONCLUSION

The results of this experimental revealed that, *Acacia saligna* and *Atriplex nummularia* could be used successfully and safely in complete diets for feeding ruminants. Also, the use of these plants (desert shrubs) as feed for livestock is considered to be partially solution of the problem of feed shortage.

Table (1): Chemical composition* of Acacia, Atriplex and clover hay used in the experimental diets.

Nutrients	*Acacia saligna*	*Atriplex nummularia*	Clover hay
Dry Matter %	89.53	88.33	90.19
Crude Protein%	17.63	18.91	16.72
Ether Extract %	01.16	01.04	02.01
Crude Fiber %	22.81	26.76	20.02
Ash %	10.67	11.67	09.81
Nitrogen free extract	47.73	41.62	51.44
DE Kcal / Kg**	2205	2077	2294
Neutral detergent fiber %	43.90	46.50	42.07

* On dry matter basis.

** Calculated on the basis of Cheeke (1987) as follow,

NDF% = 28.92 + 0.657× CF %.

DE, Kcal/ g = 4.36 – 0.0491× NDF %.

Table (2): Composition and chemical analyses (%) of the experimental diets as fed.

Ingredients	control	*Atriplex 15%*	*Acacia 15%*	*Atriplex 15% +Acacia 15%*
clover hay	30	15	15	....
Atriplex	....	15	....	15
Acacia	....	....	15	15
Barley	26.5	26.5	26.5	26.5
Wheat bran	25	25	25	25
Soybean meal	10	10	10	10
Molasses	5.5	5.5	5.5	5.5
limestone	2	2	2	2
Salt	0.5	0.5	0.5	0.5
Premix	0.5	0.5	0.5	0.5
Total	100	100	100	100
Chemical analysis (%)				
Dry Matter	89.11	88.09	87.81	87.95
Organic Matter	89.02	80.23	88.65	87.17
Crude protein	15.47	16.12	16.91	16.13
Ether Extract	1.7	1.25	1.89	1.76
Ash	13.98	17.77	15.35	14.33
Crude Fiber	14.76	17.93	16.79	17.67
Nitrogen Free Extract	54.09	46.93	49.06	50.11

Each kilogram of Vit+Min mixture contained: vitamin A, 12000 IU; vitamin E, 20 IU; menadione, 1.3 mg; Vit. D_3, 2500 ICU; riboflavin, 5.5 mg; Ca pantothenate, 12 mg; nicotinic acid, 50 mg; choline chloride, 600 mg; vitamin B_{12}, 10 µg; vitamin B_6, 3 mg; thiamine, 3 mg; folic acid, 1.0 mg; d-biotin, 50 µg. Trace mineral (milligrams per kilogram of diet): Mn, 80; Zn, 60; Fe, 35; Cu, 8; Se, 0.60.
[2]Calculated values (NRC, 1994).

Table (3): Growth performance of growing Barki lambs fed the experimental diets containing *Atriplex* and /or *Acacia*.

Item	Treatments				
	control	*Atriplex*	*Acacia*	*Atriplex* + *Acacia*	P value
Initial Body Weight (Kg)	26.17±0.46	26.34 ±0.52	25.86±0.34	26.92±0.58	NS
Final Body Weight (Kg)	36.60±1.96	39.00±1.76	37.33±2.20	35.83±1.69	NS
Daily gain (g/h/day)	150.02 ± 18.27^{ab}	180.85 ± 7.58^{a}	163.85± 39^{ab}	127.28± 11.28^{b}	0.05
Dry Matter Intake (g/h/day)	1059.81±72.49	1084.2±71.74	1007.98±87.89	946.53±61.29	NS
FCR *	7.06±0.31^{ab}	5.99±0.42^{b}	6.15±0.26^{ab}	7.43±0.16^{a}	0.05

Values are means ± S.D. Values in a row with unlike superscripts differ, P< 0.05.
a, b,: different superscripts within a row indicate significant differences (P<0.05).
*FCR= feed conversion ratio (g feed intake/g gain).

Table (4): Carcass characteristics of Barki lambs as affected by feeding complete diets containing *Atriplex* and /or *Acacia*.

Item	Treatments				
	control	*Atriplex*	*Acacia*	*Atriplex* + *Acacia*	P value
Slaughter Body Weight, (Kg)	36.67±1.96	39.00±1.76	37.33±2.20	35.83±1.69	NS
Carcass weight, (Kg)	15.89±0.39	16.10±1.05	15.02±1.02	15.75±0.38	NS
Dressing, (%)	43.33±0.49^{ab}	41.28±0.91^{bc}	40.24±0.34^{c}	43.96±1.06^{a}	0.05
Full Gut, (%)	17.13±0.58^{b}	21.70±0.97^{a}	17.73±1.25^{b}	19.45±1.03^{ab}	0.05
Empty Gut, (%)	6.41±0.16	6.08±0.31	6.43±0.17	6.48±0.82	NS
Pelt, (%)	9.11±0.85^{b}	13.80±0.69^{a}	9.35±0.39^{b}	13.66±0.48^{a}	0.0001
Liver, (%)	1.47±0.17	1.62±0.07	1.47±0.12	1.48±0.05	NS
Heart, (%)	0.35±0.01	0.36±0.02	0.35±0.02	0.37±0.03	NS
Fat Heart, (%)	0.17±0.04	0.15±0.01	0.14±0.01	0.21±0.007	NS
Spleen, (%)	0.31±0.04^{a}	0.19±0.01^{b}	0.31±0.02^{a}	0.21±0.06^{b}	NS
Lung, (%)	1.15±0.19^{ab}	1.13±0.12^{ab}	1.21±0.20^{a}	0.98±0.21^{b}	0.05
Mesentery, (%)	1.82±0.10^{ab}	2.04±0.15^{a}	1.42±0.13^{b}	1.99±0.18^{a}	0.0001

Values are means ± S.D. Values in a row with unlike superscripts differ, P< 0.05.
a, b, c ,: different superscripts within a row indicate significant differences (P<0.05).

Table (5): Physical composition of the best ribs of lambs fed the experimental diets.

Item	Treatments				
	control	*Atriplex*	*Acacia*	*Atriplex + Acacia*	P value
Best ribs weight (g)	370±0.02	420±0.03	380±0.04	360±0.04	NS
Meat Weight (g)	212.90±0.02	240.41±0.02	202.80±0.02	180±00.02	NS
Subcutaneous fat weight (g)	55.5±0.01	69.0±0.01	70.0±0.01	68.0±0.01	NS
Fat between Mussels weight (g)	29.70±0.08	30.89±0.09	35.00±0.01	29.40±0.05	NS
Total fat weight (g)	85.20±0.01	99.89±0.01	105.00±00.02	107.40±0.004	NS
Bone Weight (g)	71.9±0.01	79.7±0.01	72.2±0.01	72.6±0.08	NS

Values are means ± S.D. Values in a row with unlike superscripts differ, P< 0.05.

Table (6): Chemical composition of best ribs soft tissue of growing Barki lambs fed experimental diets containing *Atriplex* and /or *Acacia*.

Item	Treatments				
	control	*Atriplex*	*Acacia*	*Atriplex + Acacia*	P value
DM (%)	56.64±3.25	58.35±8.32	51.66±4.70	51.70±3.67	NS
Protein (%)	19.35±0.46^{a}	18.92±0.12^{a}	17.49±0.09^{b}	17.26±0.30^{b}	0.0001
Ether Extract (%)	28.23±3.32	33.66±1.52	33.35±2.71	30.68±2.71	NS
Ash (%)	0.78±0.02	0.79±0.02	0.76±0.05	0.82±0.01	NS

Values are means ± S.D.

a, b, : different superscripts within a row indicate significant differences (P<0.05).

Table (7) Biochemical Blood parameters of growing Barki lambs fed theexperimental diets containing *triplex* and /or *Acacia*.

Item	Treatments				
	Control	*Atriplex15%*	*Acacia15%*	*Atriplex15% + Acacia15%*	P value
Total Protein (mg/ dl)	6.05±0.19	6.32±0.36	6.29±0.13	5.71±0.09	NS
Albumin (mg/ dl)	3.60±0.14	3.70±0.14	3.83±0.26	3.43±0.12	NS
Globulin (mg/ dl)	2.45±0.25	2.62±0.28	2.45±0.17	2.28±0.08	NS
A/G Ratio (mg/ dl)	1.55±0.15	1.48±0.16	1.65±0.24	1.52±0.10	NS
Cholesterol (mg/ dl)	125.23±5.88^{a}	97.13±8.48^{b}	107.96±5.20^{ab}	110.81±4.17^{ab}	0.05
LDL (mg/ dl)[1]	74.48±6.12^{a}	54.34±4.05^{b}	65.92±4.01^{ab}	72.01±1.76^{a}	0.05
HDL (mg/ dl)[2]	27.78±0.47	28.38±1.02	26.63±2.15	27.17±2.10	NS
Urea (mg/ dl)	32.31±1.05^{b}	53.87±3.40^{a}	51.38±3.58^{a}	46.27±6.93^{a}	0.05
Glucose (mg/ dl)	82.93±8.56	72.55±6.17	71.16±1.01	77.27±9.70	NS

Values are means ± S.D. Values in a row with unlike superscripts differ, P< 0.05.
a, b,: different superscripts within a row indicate significant differences (P<0.05).
[1]LDL = Low density lipoprotein, [2]HDL= High density lipoprotein

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الملخص العربى

الاداء الانتاجى وصفات الذبيحة ومكونات الدم الحيوية للحملان المغذاه على علائق متكاملة تحتوى على بعض الشجيرات الصحراوية

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تم استخدام عدد 36 من ذكور الحملان البرقى بمتوسط وزن 26.5 كيلو جرام وتم توزيعهم الى اربع مجاميع متوازنة فى متوسط اوزانها كل مجموعة تحتوى على تسع حيوانات وبداخل كل مجموعة 3 مكررات (3 حيوانات بكل مكررة).

تم توزيع أربع علائق تجريبية عشوائيا على مجاميع الحيوانات كالتالي :

المجموعة الاولى وهى مجموعة المقارنة (عليقة تقليدية تحتوى على 30% دريس البرسيم مضاف اليها 70% من المخلوط المركز).

المجموعة الثانية وهى مجموعة عليقة القطف 15%(تحتوى على 15% قطف الملحى + 15% دريس البرسيم مضاف اليها 70% من المخلوط المركز السابق).

المجموعة الثالثة وهى مجموعة عليقة الأكاسيا 15%(تحتوى على 15% أكاسيا + 15 دريس البرسيم مضاف اليها 70% من المخلوط المركز السابق).

المجموعة الرابعة وهى مجموعة عليقة القطف 15% + أكاسيا 15% (تحتوى على 15% القطف الملحى + 15% أكاسيا مضاف اليها 70% من المخلوط المركز السابق).

أجريت تجربة غذائية لمدة سبعون يوميا تم خلالها سحب عينات دم من الحيوانات مرتين وفي نهاية التجربة تم أختيار ثلاثة حيوانات عشوائيا كل معاملة وتم دبحها وتقدير صفات الذبيحة لها .

وكانت أهم النتائج المتحصل عليها من تلك التجربة كالاتى:

1. سجلت الحيوانات التى غذيت على علائق تحتوى على القطف الملحى أوالأكاسيا زيادة وزنية أعلى وكفاءة تحويلية أفضل من مجموعة المقارنة.

2. تأثرت جوهرياً النسبة المئوية لكل من معدل التصافى والمعدة الممتلئة والفـروة والمـساريقا والرئة بالتغذية على كل من نوعى الشجيرات المستخدمة فى تلك التجربة.
3. لم يتأثركل من التركيب الكيماوى والتركيب الطبيعى للعضلة العينية بأحلال القطـف الملحـى والأكاسيا محل الدريس في العلائق التجريبية ماعدا النسبة المئوية للبروتين في أنـسجة هـذة العضلة الذى أنخفض معنويا في ذبائح الحملان المغذاه على علائق تحتوي علـى الأكاسـيا أو الأكاسيا مع القطف.
4. أوضحت البيانات ايضا ان إحلال 50% من دريس البرسيم بالقطف ادى الى انخفاض تركيـز الدم فى كل من الكوليستيرول والليبوبروتينات منخفضة الكثافة بينما زاد تركيز الدم من اليوريا بصورة معنوية للحيوانات التى غذيت على علائق تحتوى على القطف الملحى والأكاسيا معا.

هذة النتائج توضح انة يمكن استخدام بعض انواع الشجيرات مثل القطف الملحـى والأكاسـيا لتحل محل دريس البرسيم بنسبة تصل الى 50% فى علائق الحملان النامية دون حدوث أي تأثيرسـئ على الصفات الانتاجية لهذة للحيوانات.