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EFFECTS OF FEEDING RATIONS CONTAINING DIFFERENT LEVELS OF GROUNDNUT VINE HAY ON HEMATO-BIOCHEMICAL PARAMETERS OF BARKI EWES AND GROWTH PERFORMANCE OF THEIR LAMBS

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ABSTRACT

The present study aimed to define the effect of partial replacement of berseem hay (BH) with groundnut vine hay (GVH) (*Arachishypogaea L.*), on some haematological, biochemical, thyroid hormone parameters of Barki ewes blood. Reproductive hormones, growth performance, economic efficiency and mortality rates of the new born lambs were also estimated. Twenty-eight mature healthy Barki ewes at late pregnancy were used in the experimental work. Ewes randomly divided into four similar groups according to body weight (7 ewes each). Ewes in the first group fed berseem hay and concentrate feed mixture (control), the second, third and fourth groups fed concentrate feed mixture and increasing rates of groundnut vine hay that replacing 25% (GVH-25), 50% (GVH-50) and 75% (GVH-75) of berseem hay, respectively. Blood hematological parameters as hemoglobin Hb, packed cell volume PCV%, white blood cells WBCs and red blood cell RBCs and biochemical parameters (as glucose, total protein, albumin, globulin, triglycerides, total cholesterol, aspartate-aminotransferase AST, alanine-aminotransferase ALT, Urea-N, creatinine and thyroid hormone) of Barki ewes during late pregnancy and early suckling. Growth performance and reproductive hormone (follicle stimulating hormone FSH and luteinizing hormone LH) were estimated for new born lambs and mortality rates were also calculated.

The obtained results indicated slight differences due to dietary treatments regarding final live body weight, total gain and daily gain. Feed conversion efficiency had nearly similar values. While, the best result was recorded with ration contained 75% GVH followed by 50% GVH and 25% GVH and lastly control. Economic efficiency improved with treated rations compared to the control group.

Most blood parameter values appeared in favor to the dietary treatments *vs.* control. Differences of most hematological parameters of ewes fed different levels of groundnut vines hay (GVH) were significant. Results indicated that levels of Hb (g/dl) and PCV% values were differed significantly ($p<0.05$) but, count of WBCs and RBCs not significantly differ. Moreover, significant differences were recorded for the activity of T_3 hormone, while FSH and LH concentration in lambs were insignificantly affected by treatments.

Minor changes were noticed among the treated and control groups in glucose, total protein, triglyceride, total cholesterol, AST and ALT levels, though some differences were significant. There were significant ($P<0.05$) differences in urea-N level due to physiological status with highest values during late pregnancy followed by early suckling.

Moreover, significant differences were recorded for the activity of T_3 hormone

***Keywords**: Barki sheep, groundnuts, blood, growth performance, economical value.*

INTRODUCTION

A groundnut (Arachishypogaea L.) is an important agricultural crop in Egypt. It grow mainly in north of the country, including areas of reclaimed desert located east and west of the Nile Delta, north of Cairo. Groundnut vines hay is one of the important feed resources grows in new reclaimed sandy soil. A vast amount of 35 thousand tons from groundnut vines hay is produced annually as by-products **(A.I.E.G., 2005).**

In Egypt, groundnuts can grow under a wide range of conditions, and the product can be used for several purposes. In many sections, where berseem and other soil-renovating crops not able to withstand heat and drought of summer months, the groundnut could thrive and make an excellent growth. Use of groundnuts as forage can often be grown after the removal of oats or other spring crops, and the tops of the groundnut plant when cuted and cured in the same manner as other legumes will produce hay that almost equal in feeding value to the best quality berseem hay. The limited analysis available indicate that the annual peanut forage has very good nutritional value **(NRC 2007)**, similar to that of alfalfa **(Myer *et al.*, 2010)**. Groundnut hay is rich in crude protein (100–180 g/kg DM), has high organic matter digestibility (660–770 g/kg) for sheep and lowest value of lignin content (5.77%), while has high value of ash content (14.11%) **(Blümmel *et al*., 2005)**. In general, groundnut vine hay is sub-tropical pastures which could result in economical, environmental and zootechnical advantages. From economical and environmental views, groundnut vine hay contributes to decrease costs of animal fodder and the hazard environmental impact caused by use of fertilizers **(Rochon, 2004)**.

Groundnut vines hay had demonstrated as a good animal feed for goats **(Gelaye *et al*., 1990)** and sheep **(Mahmoud *et al*., 2003 and Talha *et al*., 2005)**. All results explored good responses on animals' performance when including it in rations to replace almost other leguminous hay. **Mahmoud *et al*. (2003)** found insignificant increase in feed intake, nutrients digestibility, daily gain and feed conversion with groundnut vines hay compared with alfalfa hay.

Therefore, the present study aimed to investigate the effect of feeding diets containing different levels of groundnut vine hay (*Arachishypogaea L.*) on some biochemical changes in Barki ewes and growth performance of fetuses during late pregnancy and of lambs during early suckling stage.

MATERIALS AND METHODS

The present study was carried out at Borg El-Arab Research Station, belonging to Animal Production Research Institute, located 50 km west of Alexandria (31° 15` N and 30° 10` E), Alexandria Governorate. The experimental work carried out under the research project "Improvement of Nutritive Value of Low Quality Roughages by Biotechnology Options to Overcome the Decrease of Animal Fodder and Decrease Methane Production in Ruminant".

Experimental animals and management

Twenty-eight Barki ewes were randomly divided into four similar groups according to body weight (7 ewes each). Ewes in the first group (control; GVH0) were fed berseem hay (BH; 40%) and concentrate feed mixture (CFM; 60%), in the second, third and fourth groups' rations 25% (GVH-25), 50% (GVH-50) or 75% (GVH-75) of berseem hay replaced by groundnut vine hay, respectively. All animals were kept under a semi-open shade partially rooved with asbestos.

Experimental feeding

The CFM consisted of 37% crushed corn, 30% crushed barley, 20% wheat bran, 10% soybean meal, 2% lime stone and 1% salt. Animals were fed roughage and concentrate according to body weight requirements and adjusted according to the physiological and productive stages **(NRC, 2007)**. Water was offered to the animals all time. Chemical composition of feedstuffs was analyzed according to **A.O.A.C. (1997)** where results presented in Table1.

Experimental periods were divided into late pregnancy (30 day pre-partum), and early suckling (30 day post-partum). Live body weight and daily body gain of offspring were recorded biweekly and mortality rates were recorded.

Chemical composition of the diet

Chemical composition of the diets is shown in Table 1.

Blood collection and analysis

Blood samples were collected biweekly from the jugular vein of each ewe at the morning

Table (1): Chemical composition of feeds used in the experiment (on DM basis %)

Chemical composition	Ingredients diet		
	CFM	BH	GVH
Dry Matter	91.20	95.12	91.00
Organic Matter	93.90	89.59	91.40
Crude Protein	15.70	10.64	10.80
Crude Fiber	14.23	38.54	33.00
Ether Extract	3.13	1.03	2.04
Nitrogen Free Extract	60.84	39.38	45.56
Ash	6.10	10.41	8.60

Concentrate feed mixture (CFM), berseem hay (BH) and groundnut vine hay (GVH)

before access to feed and water into clean test tubes with anticoagulant.

Blood samples divided into two portions. The first portion used for estimating hematological parameters including count of red blood cells (RBCs, $x10^6/mm^3$) and white blood cells (WBCs, $x10^3/mm^3$), haematocrit value (%)and haemoglobin (g/dl) concentration in the whole blood with anticoagulant which immediately determined after collection according to **Hepler (1966)**. The second portion of blood samples centrifuged at 600 *g* for 20 minutes to obtain blood plasma and stored at -20°C until assay of blood components. Total protein, albumin, globulin, glucose, triglycerides, total cholesterol, Urea-N and creatinine were determined in blood plasma colorimetrically by using commercial kits (Bio-Diagnostics, Egypt) according to the procedure outlined by the manufacturer. Aspartate-aminotransferase and alanine-aminotransferase were determined colorimetrically by using QCA kit, Amposta, Spain according to **Reitman and Frankel (1957)**. Globulin concentration was calculated by subtraction of albumin from the corresponding total protein value. Plasma triiodothyronine (T_3), thyroxin (T_4), FSH and LH hormones concentrations were determined by radioimmunoassay techniques using (coat-A-count TKT3 and TKT4) RIA Kits purchased from Diagnostic Products Corporation (DPC, Los Angeles, CA, 90045 5597, USA).

Statistical analysis

Data were analyzed using General Linear Model (GLM) procedure **(SAS, 2004)**. Duncan's New Multiple Range Test **(Duncan, 1955)** was used to detect any differences among means. Percentage values were transformed to Arc-sin values before being statistically analyzed.

RESULTS AND DISCUSSION

Growth performance of lambs

Initial live body weight, final body weight and total gain of lambs are shown in Table (2). Total and daily weight gain was insignificantly differ for the control group compared with treated groups. Though daily weight gain showed significance ($p<0.05$) of differences among groups, but size of difference did not exceed 2%, which is negligible.

Feed conversion as kg DM intake/kg gain, was the best with 75% GVH followed by 50% GVH and 25% GVH, respectively, (enhance was 9.7%, 7.2% and 8.2%, respectively compared to control group) (Table 2).

Economical evaluation

The economical evaluation of lambs' growth due to feeding rations containing GVH shown in Table (3). Lambs fed 75% GVH recorded the best economic efficiency compared to those fed 25% GVH, 50% GVH or control. The lowest value recorded with the control group. These results due to the relatively low price of GVH compared to berseem hay besides the lower feed intake of treated groups though gaining similar weights.

Table (2): Growth performance of lambs fed the experimental rations containing the three levels of groundnut vine hay

Items	Groundnut Vine hay levels (%)			
	Control	25	50	75
Experimental period (d)	120	120	120	120
Initial LBW (kg)	17.25±0.27	16.93±0.38	17.20±0.41	16.78±0.23
Final LBW (kg)	32.75±0.27	32.18±0.51	32.44±0.62	32.33±0.70
Total gain (kg)	15.50±0.23	15.25±0.18	15.24±0.13	15.55±0.12
Daily gain (g)	129.16±3.38^{a}	127.08±4.17^{b}	127.00±3.48^{b}	129.58±0.11^{a}
	Dry matter intake per head			
Concentrate feed mixture	566.06±8.14^{a}	555.78±^{b}	545.45±^{c}	547.04±^{c}
Berseem hay	384.02±8.25^{a}	288.30±^{b}	192.01±^{c}	96.01±^{d}
Groundnut vine hay	00	96.10±^{c}	192.01±^{b}	288.00±^{a}
Total dry matter intake (g)	950.08±39.2^{a}	940.18±46.2^{b}	929.47±48.1^{c}	931.05±49.1^{c}
Feed conversion DM intake/Gain	7.97±0.18	7.32±0.15	7.40±0.12	7.19±0.14

$^{a,b,c:}$ **Means with the different superscripts in the same row are significantly different (P< 0.05).**

1-Blood haematology

The mean values of blood parameters of ewes reared under different experimental diets at different pregnancy and suckling stages are presented in Table 4. In general, all examined blood parameters were within the normal ranges.

Data presented in Table 4 revealed the haematological parameters including count of RBCs and WBCs, hemoglobin (Hg, g/dl) and haematocrite (PCV, %) values for ewes at late pregnancy and early suckling stages. Most of blood pictures measures were significantly (P<0.05) higher with the different levels of GVH than the control group. Such findings indicate that ewes fed GVH-75% improved haematological parameters.

Glucose, triglyceride, total cholesterol and urea-N levels were mostly decreased (P<0.05) for ewes fed different levels of GVH compared with the control. While, total protein significantly (P<0.05) increased in treated groups (GVH-25%, GVH-50% and GVH-75%) compared to the control ewes. Moreover, no significant differences detected in blood plasma albumin and globulin concentrations among ewes fed different diets (Table 5). The highest (P<0.05) values of triglyceride and total cholesterol was in control group while the lowest (P<0.05) was 75% GVH diet. The highest (P<0.05) value of creatinine concentration was recorded with ewes fed GVH at level 50%. While, the lowest (P<0.05) value was recorded with ewes fed GVH at level 75%.

The activities of AST and ALT enzymes in blood plasma of ewes fed GVH are presented in Table 5. In general, size of difference among groups in AST and ALT enzymes activity ranged between 0 to 1.2% for AST and 1.3 to 6.3% for ALT. Thus, though the significant differences located among groups in AST and ALT enzymes activities, we can suggest that no effect occurred.

Data presented in Table 5 revealed that T3 level was significantly higher with control and 75% GVH compared to 25 and 50% GVH groups. . On the other hand, T_4 hormone revealed non-significant differences between the four experimental groups during the different physiological periods.

Table (3): Economical analysis of lambs' growth when fed rations containing different levels of groundnut vine hay.

Items	Groundnut Vine hay levels (%)			
	Control	25	50	75
	Total feed intake (g/h/d)			
CFM	566.06	555.78	545.45	547.04
BH	384.02	288.30	192.01	96.01
GVH	00	96.10	192.01	288.00
	Price of total feed intake (LE. h/d)			
CFM	2.55	2.50	2.45	2.46
BH	0.96	0.72	0.48	0.24
GVH	00	0.12	0.25	0.37
Total feeding cost, LE.	3.51	3.34	3.18	3.07
Average daily gain g/d	129.16	127.08	127.00	129.58
Price of daily gain, LE.	7.74	8.26	8.25	8.42
Net profit (LE./h/d)	4.23	4.92	5.07	5.35
Economic efficiency %	120.51	147.30	159.43	174.27
Relative improvement	100	122.23	132.30	144.61

Total price for feeds was calculated according to price of different ingredients available in Egypt.

1- The local market prices were; 4500 LE for one ton CFM, 2500 LE one ton of BH, 1300 LE one ton GVH and 65 LE price of one Kg live weight lambs.

2- Net profit = price of daily gain, LE. - total feeding cost, LE.

3- Economical efficiency (EE) = net profit / total feeding cost, LE.

4- Relative improvement of the control, assuming that the EE of the control (R1) =100

Table (4): Effect of replacing berseem hay with groundnut vine hay of diet on some haematological concentrations in blood of Barki ewes

Items	Physiological status	Groundnut Vine hay levels (%)			
		Control	25	50	75
Haemoglobin (g/dl)	Late pregnancy	12.34±0.18^{a}	12.04±0.10^{b}	12.42±0.15^{a}	12.39±0.10^{a}
	Early suckling	10.03±0.15^{b}	10.20±0.14^{ab}	11.32±0.11^{a}	10.69±0.19^{b}
	Overall mean	11.18±0.16^{b}	11.12±0.12^{b}	11.87±0.13^{a}	11.54±0.14^{a}
Haematocrite (%)	Late pregnancy	29.35±2.44^{ab}	29.67±1.35^{b}	31.27±1.48^{a}	31.95±0.96^{a}
	Early suckling	31.80±0.98^{ab}	30.75±0.50^{b}	34.15±1.91^{a}	34.10±1.32^{a}
	Overall mean	30.57±1.72^{b}	30.21±0.92^{b}	32.71±1.69^{a}	33.02±1.62^{a}
White blood cells (x103/mm3)	Late pregnancy	8.84±0.15^{a}	8.36±0.19^{b}	8.11±0.66^{c}	8.34±0.33^{b}
	Early suckling	9.90±0.43^{a}	9.36±0.66^{d}	9.19±1.01^{c}	9.53±0.31^{b}
	Overall mean	9.37±0.24^{a}	8.86±0.43^{a}	8.65±0.83^{a}	8.93±0.32^{a}
Red blood cells ($x10^6/mm^3$)	Late pregnancy	12.78±0.07^{a}	12.55±0.50^{b}	12.80±0.64^{a}	12.28±0.24^{c}
	Early suckling	10.28±0.21^{c}	10.44±0.36^{b}	10.76±0.51^{a}	10.80±0.15^{a}
	Overall mean	11.53±0.14^{a}	11.49±0.43^{a}	11.78±0.75^{a}	11.54±0.20^{a}

^{a} and ^{b} Means with the different superscripts in the same rows are significantly different (P<0.05).

2- Blood biochemical components

Mean values of glucose, total protein, albumin, globulin, triglyceride, total cholesterol, urea-N, creatinine concentrations AST, ALT, T_3 and T_4 in plasma of ewes during late pregnancy and early suckling are presented in Table 5.

Lambing performance and mortality rates

Data presented in Table 5 reveal lambing performance of Barki ewes fed berseem hay and different levels of groundnut vine hay. Ewes fed 75% GVH obtained higher litter size compared with other experimental groups (1.3, 1.0, 0.86 and 1.0 respectively). Ewes fed 50% GVH failed to wean all their lambs (one lamb died). While the other ewes of other experimental groups successfully weaned their lambs. Litter weight and size were higher in ewes fed 75% GVH then 0% GVH, 50% GVH, and lastly 25% GVH. Mortality rate of lambs from birth to weaning was 14.3% (1/7) in ewes fed 50% GVH. **Shawket *et al*. (2015)** reported high mortality rates of born alive lambs during the first week after birth (16.7 to 35.3%). **Doaa *et al*. (2009)** concluded that mortality rate increased with the low birth weights. The health condition and the nutritional status of the ewe before lambing could also influence lambs mortality. Proper attention to dam nutrition particularly concentrate supplementation enhances lamb survival by increasing birth weight, since healthy dam produce good colostrum rich in protein and immunoglobulin. In addition, improvement of health management practices during different seasons is recommended for proper lambing.

CONCLUSIONS

In conclusion, Barki ewes fed groundnut vine hay showed better blood haematology, blood biochemical component, growth rate of lambs and less mortality rate during late pregnancy and early suckling stage. In view of the availability of non-traditional green fodder (groundnut vine hay) all around the year and its compatibility to berseem hay (traditional forage with high nutritional value), it can be safety recommend use of groundnut vine hay for suckling and growing lambs. It did not have negative impact on blood biochemical parameters of suckling ewes and their lambs. The economic efficiency recommends 75% GVH ration as best level of addition.

Table (5): Effect of replacing berseem hay of diets with groundnut vine hay on some biochemical and thyroid hormones concentrations in blood of Barki ewes

Items	Physiological status	Groundnut Vine hay levels (%)			
		Control	25	50	75
Glucose (mg/dl)	Late pregnancy	59.14±1.06^{a}	59.02±1.68^{b}	55.55±1.35^{c}	55.79±1.37^{ab}
	Early suckling	50.82±1.71^{a}	49.07±1.28^{b}	48.00±1.98^{b}	51.75±1.81^{a}
	Overall mean	54.98^{a}	54.04^{b}	51.77^{c}	53.77^{b}
Total protein (g/dl)	Late pregnancy	6.75±0.70^{a}	6.24±0.19^{b}	6.65±0.30^{a}	6.57±0.70^{ab}
	Early suckling	7.20±0.05^{a}	7.11±0.01^{b}	7.14±0.01^{ab}	7.18±0.01^{a}
	Overall mean	6.97^{a}	6.67^{b}	6.89^{a}	6.87^{a}
Albumin (g/dl)	Late pregnancy	3.67±0.01	3.43±0.09	3.64±0.05	3.86±0.01
	Early suckling	2.27±0.04	2.46±0.01	2.98±0.03	2.29±0.09
	Overall mean	2.97	2.94	3.31	3.07
Globulin (g/dl)	Late pregnancy	3.84±0.08	3.11±0.02	3.90±0.05	3.68±0.01
	Early suckling	4.68±0.10	4.78±0.10	4.67±0.04	4.28±0.01
	Overall mean	4.26	3.94	4.28	3.98
Triglycerides (mg/dl)	Late pregnancy	55.48±1.05^{a}	53.29±1.32^{b}	52.57±1.29^{c}	50.49±1.20^{d}
	Early suckling	55.79±1.62^{a}	53.07±1.86^{b}	52.93±1.61^{c}	52.73±1.58^{d}
	Overall mean	55.63^{a}	53.18^{b}	52.75^{c}	50.61^{d}
Total cholesterol (mg/dl)	Late pregnancy	57.62±1.81^{a}	56.13±1.80^{c}	57.28±1.80^{a}	55.91±1.88^{b}
	Early suckling	52.69±1.28^{b}	52.65±1.33^{b}	52.96±1.29^{a}	51.45±1.71^{c}
	Overall mean	55.15^{a}	54.39^{b}	54.12^{b}	52.68^{c}
Urea-N (mg/dl)	Late pregnancy	47.92±1.85^{b}	49.16±1.81^{a}	47.81±1.93^{b}	45.24±1.02^{c}
	Early suckling	39.77±1.28^{a}	39.80±1.09^{a}	39.57±1.55^{b}	38.12±1.44^{c}
	Overall mean	43.84^{b}	44.48^{a}	43.69^{b}	41.68^{c}
Creatinine (mg/dl)	Late pregnancy	1.65±0.05^{b}	1.61±0.04^{b}	1.84±0.08^{a}	1.44±0.04^{c}
	Early suckling	1.83±0.07^{b}	1.89±0.03^{a}	1.92±0.07^{a}	1.74±0.05^{c}
	Overall mean	1.74^{b}	1.75^{b}	1.88^{a}	1.59^{c}
AST (U/l)	Late pregnancy	103.66±0.40^{a}	102.50±0.32^{b}	103.00±0.38^{a}	102.50±0.75^{b}
	Early suckling	105.75±0.14^{b}	106.50±0.91^{a}	103.75±0.35^{d}	104.50±0.32^{c}
	Overall mean	104.70^{a}	104.50^{a}	103.37^{b}	103.50^{b}
ALT (U/l)	Late pregnancy	19.75±0.77^{b}	19.25±0.65^{b}	20.50±0.12^{a}	19.50±0.80^{b}
	Early suckling	12.75±0.50^{b}	12.75±0.36^{b}	13.50±0.08^{a}	13.56±0.65^{a}
	Overall mean	16.25^{b}	16.00^{b}	17.00^{a}	16.53^{b}
T_3 (ng/ml)	Late pregnancy	1.57±0.15^{a}	1.20±0.08^{b}	1.28±0.04^{b}	1.60±0.23^{a}
	Early suckling	1.60±0.23^{c}	1.53±0.08^{d}	1.87±0.17^{a}	1.75±0.08^{b}
	Overall mean	1.58^{b}	1.36^{c}	1.57^{b}	1.67^{a}
T_4 (ng/ml)	Late pregnancy	37.75±2.76	38.47±2.99	38.05±0.61	38.00±2.06
	Early suckling	41.46±1.12	41.20±1.74	41.46±1.25	41.54±1.12
	Overall mean	39.60	39.83	39.75	39.77

^{a} and ^{b} Means with the different superscripts in the same rows are significantly different (P<0.05).

AST = Aspartate-aminotransferase and ALT = Alanine-aminotransferase

T_3 = Triiodothyronine and T_4 = Thyroxin

Table (5): Lambing performance, ewe's mortality of Barki ewes fed on rations containing different levels of groundnut vine hay

Items	Groundnut Vine hay levels (%)			
	Control	25	50%	75
Ewes number	7	7	7	7
Ewes lambing number	7	7	7	7
Lambs born	7	8	7	9
Lambs weaned	7	8	6	9
Litter size	1.0	0.86	1.0	1.3
Litter weight/Kg/h	4.14±0.31[a]	3.69±0.10[a]	4.07±0.28[a]	4.47±0.41[a]
	Viable Lambs (n-%)			
During pregnancy	-	-	-	-
At birth (n-%)	7 (100%)	8 (100%)	7 (100%)	9 (100%)
At weaning (n-%)	7 (100%)	8 (100%)	6 (85.7%)	9 (100%)

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الملخص العربى

تأثير التغذية على مستويات مختلفة من عرش الفول السودانى بعلائق نعاج البرقى على بعض المعايير الهيماتولوجية والبيوكيميائية ونمو الحملان

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أجريت هذه الدراسة في محطة بحوث برج العرب - معهد بحوث الإنتاج الحيواني بهدف معرفة تأثير العلائق المحتوية على مستويات مختلفة من عرش الفول السوداني (*Arachis hypogaea L.*) على بعض قياسات الدم الهيماتولوجية، البيوكيميائية وهرمونات الغدة الدرقية خلال مرحلة الحمل المتاخر وبداية فترة الرضاعة والكفاءة الاقتصادية ومعدلات النفوق فى حملان أغنام البرقى النامية. أستخدم فى هذه التجربة 28 نعجة برقى عشار فى نهاية مرحلة الحمل بحيث كان هناك أربع مجموعات متماثلة (7 نعاج لكل مجموعة) وذلك طبقا لوزن الجسم والعمر وتاريخ الولادة المتوقع. تمت التغذية في المجموعة الأولى على دريس البرسيم و خليط العلف المركز (المجموعة المقارنة GVH-0)، وتم تغذية المجموعات الثانية والثالثة والرابعة على 25٪ (GVH-25) و 50٪ (GVH-50) و75٪ (GVH-75) من عرش الفول السودانى المستبدل بدريس البرسيم على التوالي. تم تسجيل وزن الجسم للحملان المولودة .تم جمع عينات الدم وتقسيم كل عينة الى جزئين، الجزء الاول تم تقدير المعايير الهيماتولوجية به مباشرة بعد الجمع (الهيموجلوبين Hb، حجم كرات الدم المعباة PCV%، عدد كرات الدم الحمراء RBCs، عدد كرات الدم البيضاءWBCs) والجزء الثانى من العينة لتقدير المعايير البيوكيميائية (مستويات الجلوكوز، البروتين الكلى، الالبيومين، الجلوبيولين، الدهون الثلاثية، الكوليسترول الكلى، انزيمات الكبد، اليوريا والكرياتنين هرمونات الغدة الدرقية T_4،T_3) وذلك فى نهاية الحمل وبداية فترة الرضاعة بالاضافة الى حساب معدل النمو ومعدل النفوق وتقدير الهرمونات الجنسية للحملان المولودة حديثا من الاسبوع 12الى الاسبوع 40.كما تم حساب الكفاءة الاقتصادية للعليقة.

أشارت النتائج إلى وجود فروق طفيفة غير معنوية بين المعاملات الغذائية فيما يتعلق بالوزن النهائى للحملان حيث كانت قيم كفاءة تحويل الغذاء متقاربة وقد سجلت العليقة المحتوية على نسبة استبدال 75% اعلى قيم تليها نسب الاستبدال 25% ،50% ثم المجموعة المقارنة.

أشارت النتائج أيضا الى عدم وجود فروق معنوية فى معظم معايير الدم للنعاج التي تغذت بمستويات مختلفة من عرش الفول السوداني عن المجموعة المقارنة فى حين وجدت فروق معنوية فى نشاط هرمون T_3 وكذلك مستوى الهرمونات الجنسية للنعاج.

بينما وجد أن الحالة الفسيولوجية (مرحلة الحمل المتاخرة وبداية فترة الرضاعة) لها تاثير معنوى على جميع معايير الدم موضوع الدراسة. حيث أظهرت النتائج أن النعاج فى مرحلة الحمل المتاخرة سجلت أعلى معنوية ($P < 0.05$) لقيم Hb وWBCs وانزيم ALT والجلوبيولين واليوريا مقارنة بالنعاج فى مرحلة الرضاعة المبكرة. فى حين انخفضت قيمة PCV وعدد كرات الدم حمراء ومستوى الجلوكوز والكوليسترول الكلى والبروتين الكلي معنويا في المرحلة المتاخرة من الحمل مقارنة بالفترة المبكرة من الرضاعة. لم يكن هناك فروق معنوية مستويات الكرياتنين وانزيم AST .

من النتائج المتحصل يمكننا أن نستخلص أنه لا يوجد أي تأثير سلبى لاستخدام عرش الفول السودانى في علائق النعاج فى المرحلة المتأخرة من الحمل وكذلك أثناء بداية فترة الرضاعة على قياسات الدم موضوع البحث. كما يمكننا استخدامها فى علائق الحملان النامية بنسبة 75% علي حساب دريس البرسيم دون حدوث أي تأثير سلبى علي الأداء الإنتاجي وصحة النعاج أو الحملان ومعدل نفوقها.