



## IMPACT OF DOCKING KARADI LAMBS ON SOME BLOOD BIOCHEMICAL PARAMETERS

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### ABSTRACT

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To study the effect of docking on some blood parameters, 12 Karadi lambs were docked at birth and reared by their dams till weaning, and 12 weaned intact Karadi lambs were bought from the market. Following weaning, the docked ( $16.83 \pm 1.522$ kg) and intact ( $19.92 \pm 0.748$ kg) lambs were distributed equally into 3 treatment groups to be slaughtered at 20, 30 and 40kg. The findings demonstrated that the overall mean of serum total protein, urea, creatinine, glucose, triglyceride, cholesterol, LDL and HDL were  $5.50 \pm 0.13$  g/dl,  $30.56 \pm 1.39$ ,  $0.79 \pm 0.05$ ,  $63.61 \pm 3.48$ ,  $30.51 \pm 3.81$ ,  $51.87 \pm 4.12$ ,  $20.29 \pm 2.83$  and  $34.73 \pm 3.53$ mg/dl, respectively. It seems that docked lambs had numerically higher serum total protein, glucose and triglyceride, and lower serum urea, creatinine, cholesterol, LDL and HDL than intact lambs. Also it was shown that an increase in live body weight resulted in a decrease in LDL, VLDL, triglyceride and cholesterol, and an increase in total protein and HDL. It can be concluded that docking has no effect on studied traits.

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## INTRODUCTION

Sheep are the most significant livestock in Iraq, and are primarily farmed for lamb and mutton production. Additionally, are the most suited farm animals for the country's wide semi-arid and desert areas, and are regarded as the primary source of income in this region (Alkass and Juma, 2005). Moreover, Karadi sheep found in Kurdistan-Iraq comprise almost 20% of the total population in the country, and is distinguished by an extremely long tail that ends in a thin non-fat terminal that extends beyond the fatty lobes (Juma and Alkass, 2000).

Docking sheep has been shown to reduce metabolizable requirements due to decreased fat deposition, improve reproductive performance, and produce blocky lambs (Wohlt *et al.*, 1982; Shelton, 1990; Snyman, 2002). As a result, it benefits to consumers by enhancing live weight growth, fattening qualities, and carcass traits (Bingol *et al.*, 2006).

The assessment of biochemical profiles is well established to be an essential clinical approach that aids in the differential diagnosis of numerous diseases (Russell and Roussel, 2007). Moreover, in ruminants, metabolic profiles can be used to evaluate dietary management, sexual activity, and illness incidences (Peixoto de Oliveira and Osorio, 2007). However, limited information is available on the impact of docking on biochemical parameters, thus this experiment was carried out to assess the impact of docking Karadi lambs on several biochemical properties.

## **MATERIALS AND METHODS**

### **Animal and Experimental design**

Full details of the animals, feeding and management are described in our previous paper (Al-Sherwany and Alkass, 2022). Briefly, 12 Karadi lambs were docked at 3 days of age and reared by their dams until weaning, and 12 intact weaned Karadi lambs were obtained from market. The docked lambs (wt. = 16.83kg) and intact lambs (wt. = 19.92kg) were sorted into three equally sized treatments and slaughtered at 20, 30, and 40kg. Each group was kept in its own pen and provided a pelleted food comprising 16% protein and 2769 Kcal energy (Erbil feed Company), as well as *ad libitum* wheat straw. After measuring and removing the residue from the previous day, the concentrate was administered at 8.30 a.m. and 8.30 p.m. There was always water, multivitamins, and mineral blocks accessible. Every week, lambs were weighed before being fed in the morning, and the given feed modified accordingly.

### **Blood parameters**

Pre-slaughter, blood samples from all lambs were collected via the jugular vein (5ml) into sterile vacuum tubes Vacsure® (Clot Activator+ Gel). After 20 minutes at ambient temperature, to harvest blood serum, blood samples were centrifuged at 3,000 rpm for 10 minutes and examined, before being kept at -25°C for further analysis. Commercial kits (CML Biotech [P] Ltd) were used to serum total protein, serum urea, triglyceride, LDL, cholesterol, HDL and blood glucose levels. Very low density lipoprotein (VLDL) = Triglycerides/5 (Abdulla, *et al.*, 2019).

### **Statistical analysis**

To evaluate the influence of slaughter weight and docking on blood parameters, data were analyzed by GLM (general linear model) in SAS (2007). Duncan multiple range test (Duncan, 1955) were applied to compare differences between each factor's subclasses.

## **RESULTS AND DISCUSSION**

According to the present investigation, serum total protein, urea, creatinine and glucose averaged  $5.50 \pm 0.13$  g/dl,  $30.56 \pm 1.39$ ,  $0.79 \pm 0.05$  and  $63.61 \pm 3.48$ , mg/dl, respectively (Table 1). The obtained values herein are within the reference values given by various authors on different breeds of sheep (Kaneko *et al.*, 2008; Carlos *et al.*, 2015; Souza *et al.*, 2020) as well as Iraqi native sheep (Oramari *et al.*, 2014).

Docked lambs had numerically ( $P>0.05$ ) surpassed intact lambs of serum total protein (5.68 vs. 5.31 g/dl) and glucose (63.66 vs. 63.56 mg/dl), and lower in urea (29.50 vs 31.62 mg/dl) and creatinine (0.76 vs. 0.82 mg/dl) (Table 1). Similarly, Mona Mohammady *et al.* (2019) indicated that total protein and glucose were almost similar in the undocked and docked Barki lambs. However, Sarvar *et al.* (2009) demonstrated that urea and total protein levels in intact lambs were slightly greater ( $P>0.05$ ) than docked treatment groups.

It seems from Table (1) that total protein increased significantly ( $P<0.05$ ) from  $5.11 \pm 0.28$  g/dl at 20kg slaughter weight to  $5.76 \pm 0.14$  g/dl at 40kg slaughter weight. This rise in levels is mostly due to an increase in gamma globulin concentrations caused by antigen activation in lambs and immune system development (Silva *et al.*, 2010; Delfino *et al.*, 2014; Santos *et al.*, 2017). In the current work, the values of glucose showed no significant differences due to different slaughter weights (Table 1). Similarly, Carlos *et al.* (2015) found that age of Merada Nova lambs had no significant effect on glucose concentration.

Table (1): The effects of docking on several serum biochemical parameters in Karadi male lambs slaughtered at different weights.

Effects	No.	Slaughter Wt. (kg)	g/dl	mg/dl			
			Total Protein	B. Urea	S. Creatinine	Glucose	
Overall mean	24	30.06±1.71	5.50± 0.13	30.56± 1.39	0.79± 0.05	63.61± 3.48	
Docking	12	30.03±2.46 a	5.68± 0.18 a	29.50± 1.48 a	0.76± 0.08 a	63.66± 5.80 a	
Intact	12	30.09±2.48 a	5.31± 0.16 a	31.62± 2.38 a	0.82± 0.05 a	63.56± 4.13 a	
Slaughter Wt.	20kg	8	20.09±0.13 c	5.11± 0.28 b	27.23± 2.01 b	0.63± 0.07 b	58.74± 2.58 a
	30kg	8	29.95±0.14 b	5.62± 0.15 ab	34.70± 3.10 a	0.93± 0.07 a	72.32± 4.45 a
	40kg	8	40.15±0.08 a	5.76± 0.14 a	29.75± 1.10 ab	0.81± 0.07 ab	59.77± 8.76 a

Different letters of mean in each column are significantly differences ( $P<0.05$ ).

It seems from the results given in Table (1) that increasing slaughter weight from 20 to 40 kg resulted in a non-significant increase in urea and creatinine. However, such an increase in urea may be due to an increase in urea regenerated by the nitrogen conservation mechanism, in which some of the urea produced in the liver is released into the blood and returns to the rumen via the blood itself (Santos and Pedroso, 2011). Also, an increase in creatinine concentration may be due to the expansion of creatinine storage reservoirs as a result of increased muscular mass deposition due to the growth. Similar results have been found in lambs (Souza *et al.*, 2020), and in calves (Mohri *et al.*, 2007 and Delfino *et al.*, 2014).

In the present study, serum cholesterol, triglycerides, LDL, VLDL and HDL averaged respectively,  $51.87 \pm 4.12$ ,  $30.51 \pm 3.81$ ,  $20.29 \pm 2.83$ ,  $6.10 \pm 0.76$  and

34.73±3.53 mg/dl (Table 2). Such values are within the range obtained by Souza *et al.* (2020) in lambs. With the regard to the effect of docking lambs, it appears from Table (2) that docked lambs had slightly lower cholesterol (48.59± 4.70 mg/dl), HDL (34.47± 5.95 mg/dl), LDL (19.60± 5.10 mg/dl) and higher triglyceride (31.00± 5.84 mg/dl) than did the entire lambs. However, Sarvar *et al.* (2009) found that triglyceride and HDL levels were greater (P>0.05) in intact group than docked lambs at the beginning of fattening period, but that a drop in the two parameters cholesterol and LDL was a significant event in the docked lambs (P<0.05). To the author knowledge however, with the exception of the two reports by Sarvar *et al.* (2009) and Mona Mohammady *et al.* (2019) no further studies on the effect of docking on blood parameters have been reported in the literature.

Table (2): The effect of docking Karadi lambs, slaughtered at different weight on blood lipid profile.

Effects	No.	Slaughter Wt. (kg)	mg/dl					
			Triglycerides	Cholesterol	LDL	HDL	VLDL*	
Overall mean	24	30.06± 1.71	30.51± 3.81	51.87± 4.12	20.29± 2.83	34.73± 3.53	6.10± 0.76	
Docking	12	30.03 ± 2.46a	31.00± 5.84 a	48.59± 4.70 a	19.60± 5.10 a	34.47± 5.95a	6.20± 1.17a	
Undocking	12	30.09 ± 2.48a	30.02± 5.14 a	55.15± 6.84 a	20.98± 2.73 a	34.99± 4.07a	6.00± 1.03a	
Slaughter Wt.	20kg	8	20.09± 0.13c	47.28± 7.77 a	68.31± 6.52 a	26.35± 3.02 a	32.76± 2.50a	9.46± 1.55a
	30kg	8	29.95± 0.14b	22.75± 2.11 b	42.70± 6.83 b	10.56± 2.45 b	26.65± 3.17a	4.55± 0.42b
	40kg	8	40.15± 0.08a	21.50± 4.19 b	44.61± 4.43 b	23.96± 6.58ab	44.78± 9.05a	4.30± 0.84b

Different letters of means in each column are significantly differences (P<0.05).

\*VLDL= Triglyceride/ 5 (Abdulla, *et al.*, 2019).

In the current study, an increase in slaughter weight of lambs from 20 to 40kg resulted in a decrease (P<0.05) in cholesterol, triglycerides, LDL and VLDL levels, and an increase (P>0.05) in HDL levels. Similarly, Santos *et al.* (2017) and Souza *et al.* (2020) revealed a reduction in cholesterol and triglycerides with increasing age.

### CONCLUSION

According to the results, it appears that docking has no negative impact on a studied parameter.

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## CONFLICT OF INTEREST

We declare that we don't have affiliation or entity with any organization regarding the financial or non-financial interest in this subject matter discussed in this article.

### تأثير قطع الالية للحملان الكرادية على بعض صفات الدم الكيموحيوية

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### الخلاصة

تم في هذه الدراسة قطع الالية لـ 12 حمل كرادية عند عمر ثلاثة ايام باستخدام الحلقات المطاطية وتركت مع امهاتها لحين الفطام (2.5 شهر) و ثم شراء 12 حمل مفطوم من الاسواق المحلية. وبعد فترة تاقلم لمدة اسبوع تم توزيع كل من الحملان المقطوع الالية والاعتيادية وباوزان الابتدائية 16.83 و 19.92 كغم عشوائياً لتذبح عند اوزان 20، 30 و 40 كغم. تشير النتائج بان المعدل العام لكل من البروتين الكلي، اليوريا، الكرياتينين، الكلوكوز، الدهون الثلاثية، الكوليستيرول، البروتين الدهني منخفض الكثافة والبروتين الدهني مرتفع الكثافة قد بلغ 5.5 ± 0.13 غم/دسي ليدر، 1.39 ± 30.56، 0.05 ± 0.79، 3.48 ± 63.61، 3.81 ± 30.51، 4.12 ± 51.87، 2.83 ± 20.29 و 3.53 ± 34.73 ملغم/دسي ليدر على التوالي. كما اتضح بان الحملان مقطوعة الالية مقارنة بالحملان الاعتيادية زيادة غير معنوية في كل من البروتين، الكلوكوز والدهون الثلاثية، وانخفاض في مستويات كل من اليوريا، الكرياتينين، الكوليستيرول، البروتين الدهني منخفض الكثافة و البروتين الدهني مرتفع الكثافة. كما لوحظ بان زيادة الوزن عند الذبح قد ادت الى زيادة غير معنوية في البروتين والبروتين الدهني مرتفع الكثافة، وانخفاض في البروتين الدهني منخفض الكثافة، البروتين الدهني الكثافة منخفضة جداً، الدهون الثلاثية والكوليستيرول.

**الكلمات الدالة:** مقطوعة الالية، الحملان الكرادية، صفات الدم الكيموحيوية

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