

EFFECT OF IRON AND VITAMIN B₁₂ INJECTION ON BODY MEASUREMENTS AND SOME BLOOD CHARACTERISTICS OF AWASSI LAMBS

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ABSTRACT

The current study was conducted on 15 Awassi lambs with an average weight 11.24 ± 0.06 kg (1 month aged), Lambs were randomly divided into three groups, (5 lambs/group) 1st group: control, 2nd group injected subcutaneously once every ten days with Iron and Vitamin B₁₂ (4.54 mg/kg body weight and 4.54 µg/kg body weight) 3rd group: lambs were injected subcutaneously with Iron and vitamin B₁₂ (9.09 mg /kg body weight and 9.09 µg/kg body weight) respectively. Results showed a significant increase ($P \leq 0.05$) in final weight, total gain, daily gain, body length, chest girth, fore thickness, lymphocyte% and monocyte% in treated groups with Iron and vitamin B₁₂ compared with control group. Also results shows a significant increase ($P \leq 0.05$) in 2nd group lambs in fore height, rear height and rear thick. While there are a significant decrease in treated groups in neutrophils % and stress indices. In conclusion, iron and vitamin B₁₂ injection improved body measurements and weights body immunity in Awassi lambs.

Key words: Awassi Lambs, Measurements body, immunity, Iron, Vitamin B₁₂

Received: 18 / 8 / 2019, Accepted: 23 / 9 / 2019

INTRODUCTION

The importance of iron is shown in it's vital role in a numbers of body functions such as oxygen transport, energy production (ATP), DNA synthesis and its important role in protecting cells from oxidation processes (Cann and Ames, 2007); (Clare, et al., 2007; Ronald, 2009 and Youssef, 2012) as well as the important course of growth (Drakesmith and prentice, 2008). Some clinical signs occur of iron in animals such as low growth rates and underutilized foods (Underwood and Suttle, 2001). Iron deficiency resulted reduce in immune system effectiveness towards pathogens (Hemminki, et al., 1991), also leads to a decrease in the functions of white blood cells and the production of antibodies (Scott, et al., 1975). Vitamin B₁₂ is the basis for the metabolism of all types of animals, and it is essential to strengthen ewes during pregnancy and lactation as well as developing birth to stimulate the immune system (Girard et al., 1996 and Papadopoulou et al., (2013). Vitamin B₁₂ deficiency leads to reduced growth rates and birth weight as well as reduces the immune system functions of the animal. This study was designed to determine the effect of subcutaneous injections of iron and vitamin B₁₂ on The weight and Measurements immune performance of the Awassi lambs.

MATERIALS AND METHODS

The study was carried out in a field of sheep breeder in Baibokhet area (8 km north of Mosul), 15 Awassi lambs were randomly assigned to three groups (5 lambs / group) with average weight 11.24 ± 0.06 kg. 1st group : control, the 2nd group injected S.C with iron and vitamin B₁₂ (4.54 mg / kg body weight and 4.54 μ g / kg body weight). The 3rd group injected S.C with an Iron and Vitamin B₁₂ (9.09 mg / kg body weight and 9.09 μ g / kg body weight), respectively once every ten days for 3 months. Blood samples were taken from the jugular vein (3 ml / animal), replaced in container tubes contained (EDTA) (Al-draghi et al., 2008). The following measurements were taken during the study :

1- Measurements of lambs body: Hands measuring tape and Caliper were used for measurements of , body length, chest girth, Fore height, rear height, fore thickness and chest depth (cm). These measurements were taken after the stability of the animal and standing in normal position.

2- White blood cells count: were determined by the use of method of (Lewis and Bain, 2001).

3- Differential leucocyte count : calculated on blood smears dyed with Leishman stain (Thrall et al., 2004). Stress indices was calculated as : neutrophil/lymphocyte.

4- Weights: Lambs were weighed before the start of the study Then weighted monthly

Data were statistically analyzed using CRD Design and Duncan (1955) multiple range test used to test the differences between means by using Anonymous, (2005) statistical model was the following :

$$Y_{ijk} = \mu + T_i + e_{ijk}$$

μ = the overall mean

T_i = The effect of the treatment.

e_{ijk} = the random error effect.

RESULTS AND DISCUSSION

Table (1) showed no significant differences ($P \leq 0.05$) in initial weight of lambs, a significant increase ($P \leq 0.05$) in treated groups with iron and vitamin B₁₂ as compared with control group in final body weight and total and daily weights gain. These result are in agreement with the study of Vatn and feramstad, (2000); vellema et al., (1997); lind and blum, (1994) and Ali, (1992). The increase in body weight is due to the important role of iron and vitamin B₁₂ in growth that is reflected on body weight (papadopoubuet al., 2013, and Drakesmith and prentice, 2008).

Table (2) shows a significant increase ($P \leq 0.05$) in treated groups (iron and vitamin B₁₂) compared with control group, in body length, chest girth, fore thick, chest depth, 2nd group were Increased significantly ($P \leq 0.05$) in fore height, rear height and rear thick. The increase in the rate of body measurements in treated groups may be due to a positive correlation between the increase in body weight with measurements and body dimensions (Naziroglu, et al., 1997).

Table (1) : Mean± S.E Effect of Iron and Vitamin B₁₂ injection on body weight of Awassi lambs.

Characteristics groups	Initial B.W(kg)	Final B.W (kg)	Total B.W gain(kg)	Daily B.W gain(kg)
Control	11.26a ±0.07	23.66b ±0.08	12.40b ±0.05	0.137b ±0.01
Iron 4.54 mg + vitamin B ₁₂ 4.54 µg / kg body weight	11.06a ±0.09	25.63a ±0.07	14.60a ±0.06	0.162a ±0.03
Iron 9.09 mg + vitamin B ₁₂ 9.09 µg / kg body weight	11.39a ±0.02	25.83a ±0.05	14.44a ±0.04	0.160a ±0.02

*Means in each column with different letters are differs significantly at (P≤0.05).

Table (2) : Mean± S.E Effect of Iron and Vitamin B₁₂ injection on some body dimensions (cm) of Awassi lambs.

Characteristics groups	Body length (cm)	Chest girth (cm)	Fore height (cm)	Rear height (cm)	Fore thick (cm)	Rear thick (cm)	Chest depth (cm)
control	43.00b ±0.04	65.00b ±0.09	53.00b ±0.04.	56.50b ±0.06	14.00b ±0.08	15.00b ±0.02	26.50b ±0.05
Iron 4.54 mg + vitamin B ₁₂ 4.54 µg / kg body weight	50.50a ±0.05	72.50a ±0.04	64.50a ±0.05	64.00a ±0.04	18.50a ±0.05	19.00a ±0.04	27.50b ±0.04
Iron 9.09 mg + vitamin B ₁₂ 9.09 µg / kg body weight	53.50a ±0.02	71.00a ±0.07	58.50a ±0.08	61.00a ±0.09	17.00a ±0.06	16.29ab ±0.06	30.50a ±0.09

*Means in each column with different letters are differs significantly at (P≤0.05).

Table (3) showed there is no significant difference between the treated groups and control in white blood cells, basophils% , lymphocytes% and monocytes % , also a significant decrease (P≤0.05) in neutrophils % and stress indices in favor of the in treated. 3rd group were significant increase (P≤0.05) compared with control group in eosinophil%. This increase in white blood cells of the treatment groups compared to the control group may be due to improvements in the immune function of the body (Meydani et al., 1990). Changes in the differential number of white blood cells, which were significantly higher in lymphocytes of the treated groups, were associated with a significant reduction of the neutrophil cells compared to the control group and the effect on the stress indices, that were represented on the improvement of animals immune status and decrease stress effects (khrofa, 2013).

This can be attributed to the role of iron and vitamin B₁₂ which improved body immune system (Yusuf, 2012 and Papadopoulou et al., 2013).

Table (3): Mean± S.E Effect of Iron and Vitamin B₁₂ injection on white blood cells count and differential leucocyte count of Awassi lambs.

Characteristics groups	WBC x (mm ³)10 ³	Lymphocyte%	Neutrophil%	Acidophil%	Monocyte%	Basophils%	Stress indices N/L
control	9.66a ±0.15	47.75b ±0.10	48.75a ±0.03	1.25b ±0.25	1.75b ±0.25	1.00a ±0.00	1.02a ±0.04
Iron 4.54 mg + vitamin B ₁₂ 4.54 µg / kg body weight	11.40a ±0.17	56.25a ±0.47	39.00b ±0.07	2.00ab ±0.28	2.25a ±0.47	1.00a ±0.00	0.68b ±0.01
Iron 9.09 mg + vitamin B ₁₂ 9.09 µg / kg body weight	10.25a ±0.16	53.75a ±0.62	40.50b ±0.08	2.50a ±0.25	2.75a ±0.25	1.00a ±0.00	0.72b ±0.02

*Means in each column with different letters are differs significantly at (P≤0.05).

تأثير حقن الحديد و فيتامين B12 في قياسات الجسم وبعض صفات الدم للحملان العواسية

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الخلاصة

تم اجراء هذه الدراسة باستخدام 15 حمل عواسي بمعدل وزن 11.24±0.06 كغم وبعمر شهر واحد، وزعت الحملان عشوائيا الى ثلاثة مجاميع وواقع (5 حمل/مجموعة) المجموعة الاولى: عدت كمجموعة سيطرة والثانية حقنت تحت الجلد مرة واحدة كل عشرة ايام بعنصر الحديد وفيتامين B₁₂ (4.54 ملغم/كغم وزن جسم و4.54 مايكرو غرام/كغم وزن جسم) اما المجموعة الثالثة فقد حقنت تحت الجلد بعنصر الحديد وفيتامين B₁₂ (9.09 ملغم/كغم وزن جسم و 9.09 ميكروغرام /كغم وزن جسم) على التوالي. تبين من النتائج وجود تفوق معنوي (P≤0.05) في الوزن النهائي والزيادة الوزنية الكلية واليومية للحملان وطول الجسم ومحيط الصدر وسمك المقدمة والنسبة المئوية للخلايا اللمفاوية والخلايا وحيدة النواة للمجاميع المعاملة بالحديد وفيتامين B₁₂ مقارنة مع مجموعة السيطرة. كذلك وجود تفوق معنوي (P≤0.05) لحملان المجموعة الثانية مقارنة مع مجموعة السيطرة في صفة ارتفاع المقدمة وارتفاع المؤخرة وسمك المؤخرة . وكذلك يتضح من الدراسة حصول انخفاض معنوي (P≤0.05) للمجاميع المعاملة مقارنة مع مجموعة السيطرة في النسبة المئوية للخلايا العدلة و دليل الاجهاد. بشكل عام ادى حقن الحملان بالحديد وفيتامين B₁₂ الى تحسن وزن وابعاد الجسم والحالة المناعية للجسم في الحملان.
الكلمات المفتاحية: الحملان العواسية، قياسات الجسم، المناعة، الحديد، فيتامين B₁₂.

تاريخ استلام البحث: 2019 / 8 / 18 وقبوله: 2019 / 9 / 23

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