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COMPARISON OF THE HAEMATOLOGICAL PARAMETERS BETWEEN PREGNANT AND NON-PREGNANT DOES

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ABSTRACT

The aim of this study was to determine the blood parameters of pregnant and non-pregnant does kept under semi-arid environment of Tiaret, Algeria. Thirty four does, from the local population of rabbits (*Oryctolagus cuniculus domesticus)*, were used in this study (fourteen pregnant and twenty non-pregnant).
The animals were housed in single rabbit cages in suitable conditions. Blood samples were analysed for the number of red blood corpuscules (RBC), hemoglobin concentration (Hb), hematocrit (Ht), average volume of red blood corpuscules (MCV) and total numbers of leukocytes (WBC), mean corpuscular hemoglobin (MCH), and mean corpuscular haemoglobin concentration (MCHC) and platelets number using an automatic cell counter. In this study, most parameters were influenced by the reproductive status of the does.

Keywords: Rabbits, pregnancy, haematological parameters, reproduction.

INTRODUCTION

In Algeria, the consumption of rabbit meat is lower than other species, which lefts the rabbit livestock in its traditional aspect, despite the various advantages that it presents as its short reproductive cycle and a high prolificacy. If we consider that one doe gives birth to an average of fifty rabbits with an average live weight of 2.4 kg slaughtered per year and per rabbit, it represents a large amount of meat (60 to 65 kg per rabbit/year) with a good organoleptic quality [1].

Although local rabbit populations existing in Algeria are well adapted to climatic conditions, their prolificacy and weight are too low. In the recent years, there has been the introduction of various rabbit breeds in Algerian farms such as the Papillon, New Zealand and Gray breeds, which creates a heterogeneous population on the farms [2].

Haematological values are widely used to determine the physiological and pathological status and the adaptation to the environmental conditions and diagnosis of

animal diseases [3]. A lot of studies were made to determine the blood parameters of various domestic animals and livestock [4]. In addition to assess the metabolic condition of animals, haematological and biochemical parameters could be affected by many factors including: sex, age, reproductive status and seasonal variations [5,6,7,8,9]. On the other hand, it was reported that haematological parameters were not influenced by sexuality [10] and gestation [11]. In order to establish reference values during gestation, under usual handling conditions, this study was conducted to assess the blood parameters of pregnant and non-pregnant does kept under semi-arid environment of Tiaret, Algeria.

MATERIALS AND METHODS

Thirty four does, from the local population of rabbits, were used in this study (fourteen pregnant and twenty non-pregnant). The animals were housed in single rabbit cages in suitable conditions.

The rabbits were given *ad libitum* commercial pelleted rabbit food and drinking water. The reproductive status was determined by hand palpation and confirmed after that by the birth date, all pregnant does were at the late stage of pregnancy at the sampling date. The non-pregnant ones were assigned to the group after weaning. Blood samples with (EDTA) were collected from marginal ear vein and were brought to the biochemical laboratory within two hours for analysis.

In the whole blood samples the number of red blood corpuscules (RBC), hemoglobin concentration (Hb), hematocrit (Ht), average volume of red blood corpuscules in the blood (MCV) and total number of leukocytes (WBC), mean corpuscular hemoglobin (MCH), mean corpuscular haemoglobin concentration (MCHC) and platelets number were determined using an automatic cell counter (COBAS INTEGRA® 400 Roche, France). For each parameter, mean and standard deviation values were determined and a statistical analysis using SPSS IMB 20 And the ANOVA test was made to determine the influence of the pregnancy on the variation of the parameters.

RESULTS AND DISCUSSION

The mean values obtained from all does used in this work are reported in Table 1. All the values obtained in this study are in the range values reported in bibliography. The effect of pregnancy on haematological parameters of rabbits is showed in Table 2.

In this study a significant ($p<0.05$) difference has been found between pregnant and non-pregnant does for all parameters tested unless for RBC.

Haematological parameters for different spices of rabbits are reported by many researchers [12,9,4,13,14] but no data have been published for the domestic rabbits raised in Tiaret, Algeria.

It was found that pregnancy of a rabbits and season influenced on haematological and biochemical parameters [15] but no significant differences in haematological parameters between non-pregnant and pregnant rabbits [16].

It has been reported that red corpuscules blood count and Ht values are influenced by stress, age, gender, season and genus in rabbits [17,18]. Ht value under 30% and the decrease in Ht parallel to Hb are evaluated as anaemia [18]. However, it has been denoted that WBC count rise in rabbits rarely indicates an infection; it generally varies due to various stress factors and blood collection methods [17,18,19].

Table 1. General values of the parameters measured for all does

Parameters	N	Means	SD	Minimum	Maximum
WBC (/mm³)	34	3477,65	2154,81	1100,00	11200,00
RBCs (x10^6 /mm^3)	34	4,87	0,86	2,10	6,18
Hb (g/dl)	34	9,66	1,42	4,70	12,30
Ht (%)	34	33,37	5,40	16,90	45,10
MCV(fl)	34	67,46	6,85	56,60	79,80
MCH(pg)	34	19,69	1,90	14,40	24,57
MCHC (g/dl)	34	29,07	2,06	22,50	33,70
Platelettes (x10^3 /mm^3)	34	374,00	239,00	39,00	936,00

Table 2. Mean±SD of the different parameters measured in pregnant and non-pregnant does

Parameters	Non-Pregnant (N=20)	Pregnant (N=14)
	Mean±SD	Mean±SD
WBC (/mm³)	2215,00±676,12*	5281,43±2271,96
RBCs (x10^6 /mm^3)	4,95±0,82	4,76±0,94
Hb (g/dl)	9,23±1,43*	10,28±1,19
Ht (%)	30,98±4,74*	36,79±4,46
MCV(fl)	62,86±3,64*	74,03±4,54
MCH(pg)	18,73±1,54*	21,07±1,51
MCHC (g/dl)	29,82±1,96*	28,00±1,76
Platelettes (x10^3 /mm^3)	469,50±254,99*	237,57±126,08

**Significantly differences between the two groups (p<0.05)*

The WBC values reported of the rabbits kept alone were higher than in rabbits fed together in groups [20]. However, reported that any increase in MCV, MCH and decrease in MCHC of rabbit above or below the normal range indicates macrocytic hypochronic anaemia [21], probably due to the increased activity of bone marrow and/or deficiency of some haemopoietic factors influencing the capacity of bone marrow to produce erythrocytes [22].

CONCLUSION

In this study, we have concluded that the reproductive status influenced the haematological parameters in rabbits so that it must be considered in the case of haematological parameters analysis and comparison with standard values. Furthermore, our work provides the reference values for comparison in the local population raised in the north west of Algeria.

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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