Studies On Influence Of Varying Age And Sex On Hematological Indices And Physiological Parameters Of Pateri Goat Breed Of Sindh

Muhammad Arif[1], Allah Bux Kachiwal[1], Zia ur Rehman[2], Saeed Ahmed Soomro[1], Jahanzaib Khaliq[1]*, Hazrat Bilal[2] , Naseer Ahmed[2] , Ruqia Malik Dad[3] , Zain Ul Abideen[2] , Haseeb Zafar[2] , Shahzad Ahmed[1] , Shua Namood[4] , Muhammad Bilal Khan[2] , Muhammad Mushraf Ali[4], Tayyab Ahmad[2]

[1]Department of Veterinary Physiology and Biochemistry, Faculty of Animal Husbandry and Veterinary Sciences, Sindh Agriculture University Tandojam, Pakistan.
[2]Departmant of Livestock and Dairy Development, Quetta, Balochistan.
[3]Secondary School Teacher (Science, BS17), Department of Education, Balochistan.
[4]Faculty 0f Poultry Husbandry and Veterinary Sciences, Sindh Agriculture University Tandojam, Pakistan.
[5]Institute of Pharmacy, Physiology and Pharmacology of Veterinary Sciences, Agriculture University Faisalabad, Pakistan.

* **Corresponding author**: jahanzaib Khaliq
*** Email**: jahanzaibvet@gmail.com

Abstract
This study explored the influence of varying age and sex on hematological and physiological parameters of pateri goat breed of Sindh.60 Pateri goat breed of both sexes (male and female) were selected. Group-A (male 3-5 months), group-B (female 3-5 months), group-C (male 6-10 months), group-D (female 6-10 months), group-E (male 11-15 months) and group-F (female 11-15 months).Physiological parameters were determined. Blood samples were collected for determination of packed cell volume (PCV), hemoglobin (Hb) concentration, mean corpuscular hemoglobin (MCH), mean corpuscular hemoglobin concentration (MCHC), mean corpuscular volume (MCV) and differential leukocyte count (DLC).The results indicates that pulse rate was recorded higher in group A and lower in group F. Respiratory rate was observed higher in group F and lower in group D. Rectal temperature was noted higher in group D and lower in group A. Hemoglobin count was determined higher in group F and lower in group A. RBC count was determined higher in group F and lower in group A. WBC count was determined higher in group F and lower in group A. MCV count was determined higher in group F and lower in group A. MCHC count was determined higher in group F and lower in group A. MCH count was determined higher in group F and lower in group A. ESR count was determined higher in group F and lower in group A. Granulocytes count was determined higher in group F and lower in group A. Platelets count was determined higher in group F and lower in group A. Lymphocytes count was determined higher in group F and lower in group A. Monocytes count was determined higher in group F and lower in group A. Red cell distribution was determined higher in group F and lower in group A. MPV was determined higher in group F and lower in group A. It is concluded that Physiological observations were fluctuated among the different age and sex of goats while, maximum values of all blood parameters were determined in group F (adult female of 11-15 months age).

Key words: Pateri Goat, Physiological and Hematological Parameters, Age, Sex

INTRODUCTION

Livestock accounts for 58.33 percent of farm added value and 11.39 percent of GDP. In the rural economy and in rural socio-economic growth, livestock plays a significant and critical function. Almost 8 million families are interested in livestock raising, deriving more than 35 percent of the revenue from the operations of livestock processing. It is essential to the livelihoods of the country's rural poor. It is undeniably a means of cash revenue, supplying the rural and most disadvantaged people with a crucial and sometimes the only source of income. So it will play an important role for the nation in alleviating poverty and foreign exchange earnings. According to the Latest Economic Census of Pakistan (2017-18), the country's goat population was 74.1 million with 915 tonnes of annual milk, 4262 thousand tonnes of meat and 28.560 million tonnes of skin output (GOP, 2019).Goats in most western agricultural production systems are significant livestock animals. For the supply of milk, meat and other requires, rural families own small ruminants. Recognition of the value of goats is produced as a consequence of the potential of goats to work in marginal circumstances unfavourable to cattle and sheep (Asnakew, 2005). Other livestock largely neglect their preferred diet, and goats can thus make a major contribution to solving food issues in many arid and semi-arid countries, where starvation and deprivation are prevalent (Bushara, 2010). Approximately 90% of livestock are raised under the conventional pastoral method, primarily in the Western States of Kordofan, Darfur and the Southern States, rangelands that cover a region of 110 million hectares and yield approximately 18.6 million tonnes of crops. Range land supplies approximately 86 percent of livestock feed, crop

residues and farmland 10 percent, while 4 percent contributes to irrigated forage and concentrate. Compared to other livestock groups, the rangelands suffer from un-even distribution of stocking power, bush fires, deforestation, un-even distribution of water supplies and the promotion of both conventional and mechanised agriculture is comparatively restricted. The assumption that goats are elements that are environmentally hostile may be traced to one. Meager studies are present about their unique requirements for husbandry (Bushara, 2010).Goats are among the first meat-domesticated creatures and have been bred for a while by humans for food and subsistence. 75.8% of local, marginal and landless farmers participate and 24.2% of goat farming in rural areas is contributed by medium and big farmers (Haque *et al*., 2013). It then plays a dominant position in the development processes of small ruminants and acts as a source of survival for rural landless farmers. "The Poor Man's Cow" is often known to be goats as it is limited in size; thus, they do not need broad management skills and are easily controlled and managed by women and children (Kannan *et al*., 2011). In a secondary method of grazing on cultivated fallow ground, along the road and channel sides without any supplementation, they are usually raised by "poverty-stricken" village residents (Amin *et al*., 2001). Farmers are now attempting to adapt and rear goats under an intense management scheme with the enormous growth in the human population coupled with the demand for red meat. It was also recorded that farmers were bound to depend on the uncertain pedigree of the group centred buck breeding scheme (Khandoker *et al*., 2011).

Effective goat husbandry relies primarily on the climate in which the goats and their management scheme are reared. Adult body weight is a significant and economic element influencing the development and output trend of the goat sector (MacHugh and Bradley, 2011). The consumer demand, which progressively wants healthier foods, is making goat meat famous because it has a low fat content relative to other red meats (Kannan *et al*., 2011). Factors such as slaughter age, ethnicity, castration, diet and butchering techniques may affect the quality characteristics of goat meat (Costa *et al*., 2013). Food is predominant among both, so any improvement in animal diets increases both the quantity and consistency of the finished product (Geay *et al*., 2011).Variations of haematological indexes and physiological parameters are precious health condition markers. Since very little knowledge on the usual haematology and physiological parameters of the Pateri goat is available. Under the influence of age, sex in the Pateri goat breed of Sindh for the diagnosis of health and disease status, it would be useful to report these improvements. This research is also intended to be carried out in order to accomplish the objectives below.

MATERIALS AND METHODS

Study area

The research was conducted in the Department of veterinary Physiology and Biochemistry, Sindh Agriculture University Tandojam.

Animals

The study was carried out on 60 Pateri goat breed of both sexes (male and female). The blood samples were collected from physiologically healthy kids, young and adult goats. (Table 1)

Experimental design

Table I.

Group	Age months	Sex	Animal No:
A (male kid)	3-5	Male	10
B (female kid)	3-5	Female	10
C (Young male)	6-10	Male	10
D (Young Female)	6-10	Female	10
E (Adult male)	11-15	Male	10
F (Adult Female)	11-15	Female	10

Physiological parameters

Rectal temperature (^{0}F)

The rectal temperature was extracted by a digital clinical thermometer from the rectum. The temperature of the body was measured by inserting a medicinal thermometer in the animal's rectum for a minimum of two minutes.

Respiratory rate (breath/minute)

The respiratory rate was measured by a stethoscope that counted the lung activity frequency. The rate of respiration was measured by examining thoraco-abdominal motions for each breath and also by applying a stethoscope to the thoracic cavity.

Heart rate (beat/min)

The heart rhythm (beat/min) was measured using a stethoscope by measuring the heart rate every minute. The heart rhythm was determined through stethoscopic auscultation of heart tones.

Collection of blood samples

Blood tests were obtained from the goat's jugular vein (5 ml) in each animal's blood using 5 ml of sterile plastic disposable syringes. Two ml of blood samples is moved to heparinized tubes instantly (EDTA). These specimens were immediately used to establish haematological parameters. The remaining samples deposited in plain plastic tubes were permitted to coagulate at room temperature for 2 hours; the sera were then extracted by centrifugation for 15 min at 3000 rpm and placed in sealed plastic containers at -20 0C before examined (Yousaf *et al*., 2016).

Determination of blood samples

The erythrocytes' packed cell volume (PCV) was determined. The concentration of haemoglobin (Hb) was calculated. Calculated by Jain formulae, Mean Corpuscular Hemoglobin (MCH), Mean Corpuscular Hemoglobin Concentration (MCHC) and Mean Corpuscular Volume (MCV) (Jain, 1998). The differential leukocyte count (DLC) in thin May-Giemsa stained blood smears was calculated microscopically from a count of 100 leukocytes (Mohri *et al*., 2007).

STATISTICAL ANALYSIS

In order to draw the mean value and standard error of the outcomes, the data was evaluated. To assess the effect of differing age and sex on haematological indices and physiological parameters investigated using SPSS version 15 computer programmes, the One-Way Variance Analysis (ANOVA) test was used. The Duncan Multiple Range Test was used to conduct mean separation

Pulse rate (beats/minute)

Influence of varying age and sex on pulse rate of Pateri goat breed of Sindh is mentioned in Table II. According to statistical analysis of data the difference in pulse rate among the varying age and sex groups were non-significant ($p>0.05$). Maximum pulse rate (81.20 beats/minute) was determined in group A as compared to group C (80.20 beats/minute), B (79.90 beats/minute), E (79.90 beats/minute) and F (79.90 beats/minute), correspondingly. Minimum pulse rate (79.40 beats/minute) was determined in group D.

Table II.Influence of varying age and sex on pulse rate (beat/minute) of Pateri goat breed of Sindh

Animals	Group A (male kid)	Group B (female kid)	Group C (young male)	Group D (young female)	Group E (adult male)	Group F (adult female)
	3-5 m	**3-5 m**	**6-10 m**	**6-10 m**	**11-15 m**	**11-15 m**
1	81	80	81	81	80	79
2	82	80	80	79	81	80
3	80	81	81	78	80	81
4	82	80	80	79	81	80
5	81	79	82	81	79	78
6	81	79	80	80	78	79
7	82	80	81	80	79	80
8	80	82	80	79	80	81
9	81	79	79	78	81	80
10	82	79	78	79	80	81
Mean ±SE	**81.20 ±0.24[a]**	**79.90 ±0.31[b]**	**80.20 ±0.35[b]**	**79.40 ±0.33[b]**	**79.90 ±0.31[b]**	**79.90 ±0.31[b]**

Superscripts among the mean values indicates significant ($p<0.05$) difference from one another.

Respiratory rate (breaths/minute)

Influence of varying age and sex on respiratory rate of Pateri goat breed of Sindh is mentioned in Table III. According to statistical analysis of data the difference in respiratory rate among the varying age and sex groups were significant ($p<0.05$). Significantly maximum respiratory rate (22.50 breaths/minute) was determined in group F as compared to group C (21.90 breaths/minute), E (21.20 breaths/minute), A (20.20 breaths/minute) and B (20.20 breaths/minute), correspondingly. Minimum respiratory rate (19.50 breaths/minute) was determined in group D.

Table III.Influence of varying age and sex on respiratory rate (breath/minute) of Pateri goat breed of Sindh

Animals	Group A (male kid)	Group B (female kid)	Group C (young male)	Group D (young female)	Group E (adult male)	Group F (adult female)
	3-5 m	**3-5 m**	**6-10 m**	**6-10 m**	**11-15 m**	**11-15 m**
1	20	22	23	19	19	23
2	21	21	23	18	21	24
3	22	19	22	17	22	21
4	21	19	21	18	23	22

5	21	22	22	21	21	23
6	19	21	23	20	21	23
7	18	21	22	22	22	22
8	19	20	20	21	20	21
9	20	18	21	20	22	22
10	21	19	22	19	21	24
Mean ±SE	**20.20 ±0.38^{cd}**	**20.20 ±0.44^{cd}**	**21.90 ±0.31^{ab}**	**19.50 ±0.50^{d}**	**21.20 ±0.35^{bc}**	**22.50 ±0.34^{a}**

Superscripts among the mean values indicates significant ($p<0.05$) difference from one another.

Body temperature (^{0}F)

Influence of varying age and sex on body temperature of Pateri goat breed of Sindh is mentioned in Table IV. According to statistical analysis of data the difference in body temperature among the varying age and sex groups were significant ($p<0.05$). Significantly maximum body temperature (102.05^{0}F) was determined in group D and E as compared to group F (101.97^{0}F), C (101.67^{0}F) and B (101.64^{0}F), correspondingly. Minimum body temperature (101.50 ^{0}F) was determined in group A.

Table IV.Influence of varying age and sex on body temperature (^{0}F) of Pateri goat breed of Sindh

Animals	**Group A (male kid)**	**Group B (female kid)**	**Group C (young male)**	**Group D (young female)**	**Group E (adult male)**	**Group F (adult female)**
	3-5 m	**3-5 m**	**6-10 m**	**6-10 m**	**11-15 m**	**11-15 m**
1	101.1	102.1	102.1	101.1	102.1	102.1
2	101.2	102.1	102.1	102.1	102.1	101.2
3	102.3	101.1	101.2	102.1	102.2	101.2
4	101.1	101.1	101.2	102.1	102.1	102.1
5	102.2	101.2	101.3	102.2	101.2	102.2
6	101.1	102.2	102.2	102.1	102.1	102.3
7	102.1	102.2	101.1	102.3	102.3	102.2
8	101.2	101.2	102.2	102.2	102.2	102.1
9	101.3	101.1	101.1	102.1	102.1	102.1
10	101.4	102.1	102.2	102.2	102.1	102.2
Mean ±SE	**101.50 ±0.15^{c}**	**101.64 ±0.16^{bc}**	**101.67 ±0.16^{abc}**	**102.05 ±0.10^{a}**	**102.05 ±0.09^{a}**	**101.97 ±0.13^{ab}**

Superscripts among the mean values indicates significant ($p<0.05$) difference from one another.

Hemoglobin count (g/dl)

Influence of varying age and sex on hemoglobin count of Pateri goat breed of Sindh is mentioned in Table V. According to statistical analysis of data the difference in hemoglobin count among the varying age and sex groups were significant ($p<0.05$). Significantly higher level of hemoglobin count (8.26 g/dl) was determined in group F as compared to group E (7.59 g/dl), D (7.35 g/dl), C (6.76 g/dl) and B (6.47 g/dl), correspondingly. Lower level of hemoglobin count (5.68 g/dl) was determined in group A.

Table V.Influence of varying age and sex on hemoglobin count (g/dl) of Pateri goat breed of Sindh

Animals	**Group A (male kid)**	**Group B (female kid)**	**Group C (young male)**	**Group D (young female)**	**Group E (adult male)**	**Group F (adult female)**
	3-5 m	**3-5 m**	**6-10 m**	**6-10 m**	**11-15 m**	**11-15 m**
1	6.0	6.4	6.5	7.2	7.3	8.1
2	6.2	6.5	6.7	7.3	7.5	8.2
3	5.9	6.3	6.6	7.1	7.3	8.4
4	5.8	6.6	6.3	7.8	7.7	8.5
5	5.6	6.3	6.7	7.6	7.6	8.4
6	5.4	6.8	6.9	7.4	7.8	8.3
7	5.5	6.1	7.0	7.3	7.6	8.0
8	5.7	6.2	6.8	7.5	7.9	8.4
9	5.4	6.8	7.1	7.2	7.7	8.2
10	5.3	6.7	7.0	7.1	7.5	8.1
Mean ±SE	**5.68 ±0.09^{f}**	**6.47 ±0.07^{e}**	**6.76 ±0.07^{d}**	**7.35 ±0.07^{c}**	**7.59 ±0.06^{b}**	**8.26 ±0.05^{a}**

Superscripts among the mean values indicates significant ($p<0.05$) difference from one another.

RBC (x10^3/µl)

Influence of varying age and sex on RBC count of Pateri goat breed of Sindh is mentioned in Table VI. According to statistical analysis of data the difference in RBC count among the varying age and sex groups were significant ($p<0.05$). Significantly higher level of RBC count ($1.16x10^3$/µl) was determined in group F as compared to group E ($1.15x10^3$/µl), D ($1.12x10^3$/µl), C ($1.09x10^3$/µl) and B ($0.94x10^3$/µl), correspondingly. Lower level of RBC count ($0.82x10^3$/µl) was determined in group A.

Table VI. Influence of varying age and sex on RBC count ($x10^3$/µl) of Pateri goat breed of Sindh

Animals	Group A (male kid)	Group B (female kid)	Group C (young male)	Group D (young female)	Group E (adult male)	Group F (adult female)
	3-5 m	**3-5 m**	**6-10 m**	**6-10 m**	**11-15 m**	**11-15 m**
1	0.80	0.90	1.11	1.14	1.15	1.18
2	0.87	0.95	1.09	1.12	1.16	1.17
3	0.90	0.96	1.12	1.11	1.17	1.15
4	0.78	0.89	1.10	1.13	1.14	1.17
5	0.75	0.88	1.13	1.12	1.15	1.18
6	1.00	0.86	1.12	1.14	1.16	1.16
7	0.85	1.01	1.09	1.12	1.17	1.18
8	0.80	1.00	1.08	1.14	1.16	1.17
9	0.77	1.03	1.02	1.11	1.15	1.15
10	0.75	1.01	1.06	1.12	1.16	1.17
Mean ±SE	**0.82 ±0.02^{e}**	**0.94 ±0.01^{d}**	**1.09 ±0.01^{c}**	**1.12 ±0.03^{bc}**	**1.15 ±0.03^{ab}**	**1.16 ±0.03^{a}**

Superscripts among the mean values indicates significant ($p<0.05$) difference from one another.

WBC ($x10^3$/µl)

Influence of varying age and sex on WBC count of Pateri goat breed of Sindh is mentioned in Table VII. According to statistical analysis of data the difference in WBC count among the varying age and sex groups were significant ($p<0.05$). Significantly higher level of WBC count (16.76 $x10^3$/µl) was determined in group F as compared to group E (16.44 $x10^3$/µl), D (15.04 $x10^3$/µl), C (16.01 $x10^3$/µl) and B (15.17 $x10^3$/µl), correspondingly. Lower level of WBC count (11.30 $x10^3$/µl) was determined in group A.

Table VII. Influence of varying age and sex on WBC count ($x10^3$/µl) of Pateri goat breed of Sindh

Animals	Group A (male kid)	Group B (female kid)	Group C (young male)	Group D (young female)	Group E (adult male)	Group F (adult female)
	3-5 m	**3-5 m**	**6-10 m**	**6-10 m**	**11-15 m**	**11-15 m**
1	11.5	11.6	16.8	15.9	16.9	16.9
2	11.4	14.5	16.7	11.1	16.3	16.7
3	11.2	16.6	16.8	11.3	16.4	16.8
4	11.2	15.7	16.3	16.6	16.6	16.8
5	11.4	15.6	16.5	15.8	15.3	16.9
6	11.3	15.4	16.4	15.9	16.2	16.8
7	11.2	15.5	15.7	16.2	16.9	16.7
8	11.2	15.6	15.8	16.4	16.7	16.9
9	11.4	15.7	14.6	15.7	16.5	16.6
10	11.2	15.5	14.5	15.5	16.6	16.5
Mean ±SE	**11.30 ±0.03^{d}**	**15.17 ±0.42^{bc}**	**16.01 ±0.27^{ab}**	**15.04 ±0.64^{c}**	**16.44 ±0.14^{a}**	**16.76 ±0.04^{a}**

Superscripts among the mean values indicates significant ($p<0.05$) difference from one another.

MCV (fl)

Influence of varying age and sex on MCV count of Pateri goat breed of Sindh is mentioned in Table VIII. According to statistical analysis of data the difference in MCV count among the varying age and sex groups were significant ($p<0.05$). Significantly higher level of MCV count (59.56 fl) was determined in group F as compared to group E (54.22 fl), D (45.43 fl), C (38.54 fl) and B (36.63 fl), correspondingly. Lower level of MCV count (35.50 fl) was determined in group A.

Table VIII. Influence of varying age and sex on MCV count (fl) of Pateri goat breed of Sindh

Animals	Group A (male kid)	Group B (female kid)	Group C (young male)	Group D (young female)	Group E (adult male)	Group F (adult female)
	3-5 m	**3-5 m**	**6-10 m**	**6-10 m**	**11-15 m**	**11-15 m**
1	34.4	36.5	40.1	44.2	54.2	60.1
2	34.6	36.4	39.2	43.2	54.3	60.2
3	35.7	36.4	38.3	44.6	53.2	59.3
4	36.8	35.6	37.4	44.7	52.8	58.8
5	34.4	37.2	37.8	44.8	52.9	59.2
6	35.5	37.1	37.9	45.2	53.3	57.9
7	36.3	37.3	37.7	46.3	54.7	58.8
8	34.5	36.6	38.9	46.8	55.6	60.9
9	36.6	36.7	39.1	47.3	56.1	60.1
10	36.2	36.5	39.0	47.2	55.1	60.3
Mean ±SE	**35.50 ±0.30^{f}**	**36.63 ±0.15^{e}**	**38.54 ±0.26^{d}**	**45.43 ±0.44^{c}**	**54.22 ±0.36^{b}**	**59.56 ±0.28^{a}**

Superscripts among the mean values indicates significant ($p<0.05$) difference from one another.

MCHC (%)

Influence of varying age and sex on MCHC count of Pateri goat breed of Sindh is mentioned in Table IX. According to statistical analysis of data the difference in MCHC count among the varying age and sex groups were significant ($p<0.05$). Significantly higher level of MCHC count (32.44%) was determined in group F as compared to group E (31.96%), D (31.68%), C (31.25%) and B (30.14%), correspondingly. Lower level of MCHC count (28.07%) was determined in group A.

Table IX. Influence of varying age and sex on MCHC count (%) of Pateri goat breed of Sindh

Animals	Group A (male kid)	Group B (female kid)	Group C (young male)	Group D (young female)	Group E (adult male)	Group F (adult female)
	3-5 m	**3-5 m**	**6-10 m**	**6-10 m**	**11-15 m**	**11-15 m**
1	27.9	30.1	31.1	31.1	31.6	32.1
2	27.6	29.9	31.2	31.5	31.9	32.3
3	27.5	29.8	31.5	31.8	32.1	32.5
4	27.4	29.7	31.7	31.9	32.2	32.6
5	28.2	30.2	31.6	31.8	31.9	32.7
6	29.1	30.3	31.9	31.9	32.3	32.5
7	28.2	30.4	30.8	32.1	32.4	32.8
8	28.8	30.5	30.9	31.1	32.2	32.5
9	27.9	30.3	30.7	31.7	31.9	32.1
10	28.1	30.2	31.1	31.9	31.1	32.3
Mean ±SE	**28.07 ±0.17^{e}**	**30.14 ±0.08^{d}**	**31.25 ±0.12^{c}**	**31.68 ±0.10^{b}**	**31.96 ±0.12^{b}**	**32.44 ±0.07^{a}**

Superscripts among the mean values indicates significant ($p<0.05$) difference from one another.

MCH (pg)

Influence of varying age and sex on MCH count of Pateri goat breed of Sindh is mentioned in Table X. According to statistical analysis of data the difference in MCH count among the varying age and sex groups were significant ($p<0.05$). Significantly higher level of MCH count (76.25 pg) was determined in group F as compared to group E (70.87 pg), D (67.83 pg), C (65.08 pg) and B (62.62 pg), correspondingly. Lower level of MCH count (61.59 pg) was determined in group A.

Table X.Influence of varying age and sex on MCH count (pg) of Pateri goat breed of Sindh

Animals	Group A (male kid)	Group B (female kid)	Group C (young male)	Group D (young female)	Group E (adult male)	Group F (adult female)
	3-5 m	**3-5 m**	**6-10 m**	**6-10 m**	**11-15 m**	**11-15 m**
1	61.7	62.1	65.1	67.1	70.1	71.1
2	61.6	62.4	65.5	68.2	71.3	74.2
3	61.9	63.1	64.4	67.5	72.2	74.7
4	61.1	63.2	64.6	67.5	72.1	75.9
5	61.6	62.5	66.7	68.3	70.3	76.7

6	61.8	62.6	66.4	68.4	70.5	77.1
7	61.4	63.1	64.7	67.5	70.4	77.4
8	61.3	63.2	63.9	68.3	70.3	78.9
9	61.8	61.9	64.8	67.8	70.8	78.8
10	61.7	62.1	64.7	67.7	70.7	77.7
Mean ±SE	**61.59 ±0.07^{f}**	**62.62 ±0.15^{e}**	**65.08 ±0.27^{d}**	**67.83 ±0.14^{c}**	**70.87 ±0.23^{b}**	**76.25 ±0.75^{a}**

Superscripts among the mean values indicates significant ($p<0.05$) difference from one another.

ESR (mm/hr)

Influence of varying age and sex on ESR count of Pateri goat breed of Sindh is mentioned in Table XI. According to statistical analysis of data the difference in ESR count among the varying age and sex groups were significant ($p<0.05$). Significantly higher level of ESR count (1.17 mm/hr) was determined in group F as compared to group E (1.12 mm/hr), D (1.11 mm/hr), C (1.07 mm/hr) and B (1.04 mm/hr), correspondingly. Lower level of ESR count (0.83 mm/hr) was determined in group A

Table XI.Influence of varying age and sex on ESR count (mm/hr) of Pateri goat breed of Sindh

Animals	**Group A (male kid)**	**Group B (female kid)**	**Group C (young male)**	**Group D (young female)**	**Group E (adult male)**	**Group F (adult female)**
	3-5 m	**3-5 m**	**6-10 m**	**6-10 m**	**11-15 m**	**11-15 m**
1	0.9	1.0	1.1	1.1	1.2	1.2
2	0.8	1.1	1.1	1.2	1.1	1.2
3	0.	1.0	1.1	1.1	1.2	1.1
4	0.9	1.0	1.1	1.1	1.0	1.2
5	0.8	1.0	1.0	1.0	1.2	1.2
6	0.9	1.1	1.1	1.1	1.1	1.1
7	1.0	1.1	1.0	1.2	1.1	1.1
8	1.0	1.0	1.1	1.1	1.1	1.2
9	1.0	1.1	1.0	1.1	1.0	1.2
10	1.0	1.0	1.1	1.1	1.2	1.2
Mean ±SE	**0.83 ±0.09^{c}**	**1.04 ±0.01^{b}**	**1.07 ±0.01^{ab}**	**1.11 ±0.01^{ab}**	**1.12 ±0.02^{ab}**	**1.17 ±0.01^{a}**

Superscripts among the mean values indicates significant ($p<0.05$) difference from one another.

Granulocytes (%)

Influence of varying age and sex on granulocytes count of Pateri goat breed of Sindh is mentioned in Table XII. According to statistical analysis of data the difference in granulocytes count among the varying age and sex groups were significant ($p<0.05$). Significantly higher level of granulocytes count (42.42%) was determined in group F as compared to group E (38.88%), D (36.48%), C (34.42%) and B (31.48%), correspondingly. Lower level of granulocytes count (29.69%) was determined in groupA.

Table XII.Influence of varying age and sex on granulocytes count (%) of Pateri goat breed of Sindh

Animals	**Group A (male kid)**	**Group B (female kid)**	**Group C (young male)**	**Group D (young female)**	**Group E (adult male)**	**Group F (adult female)**
	3-5 m	**3-5 m**	**6-10 m**	**6-10 m**	**11-15 m**	**11-15 m**
1	29.9	30.2	33.1	35.3	38.1	40.1
2	29.8	31.2	33.5	36.4	39.2	40.9
3	29.5	31.1	34.4	36.9	38.8	40.5
4	30.1	31.2	34.5	37.3	38.7	41.3
5	30.4	31.3	35.3	37.2	39.2	42.3
6	29.4	31.5	35.8	37.3	39.7	43.5
7	29.3	31.5	34.9	36.5	38.7	44.2
8	29.2	32.1	33.8	36.9	39.1	43.3
9	29.2	32.4	34.5	35.1	38.2	44.5
10	30.1	32.3	34.4	35.9	39.1	43.6
Mean ±SE	**29.69 ±0.13^{f}**	**31.48 ±0.20^{e}**	**34.42 ±0.25^{d}**	**36.48 ±0.25^{c}**	**38.88 ±0.15^{b}**	**42.42 ±0.51^{a}**

Superscripts among the mean values indicates significant ($p<0.05$) difference from one another.

Platelets (x10^3/µl)

Influence of varying age and sex on platelets count of Pateri goat breed of Sindh is mentioned in Table XIII. According to statistical analysis of data the difference in platelets count among the varying age and sex groups were significant ($p<0.05$). Significantly higher level of platelets count (2269.0 x10^3/µl) was determined in group F as compared to group E (2219.5 x10^3/µl), D (2139.0 x10^3/µl), C (2111.0 x10^3/µl) and B (1922.5 x10^3/µl), correspondingly. Lower level of platelets count (1824.4 x10^3/µl) was determined in group A.

Table XIII.Influence of varying age and sex on platelets count (x10^3/µl) of Pateri goat breed of Sindh

Animals	Group A (male kid)	Group B (female kid)	Group C (young male)	Group D (young female)	Group E (adult male)	Group F (adult female)
	3-5 m	**3-5 m**	**6-10 m**	**6-10 m**	**11-15 m**	**11-15 m**
1	1755	1895	2055	2160	2210	2245
2	1756	1885	2060	2165	2215	2250
3	1758	1865	2055	2140	2220	2295
4	1835	1955	2140	2145	2230	2290
5	1855	1855	2145	2160	2250	2255
6	1935	1965	2145	2155	2210	2260
7	1865	1965	2130	2110	2240	2265
8	1755	1990	2145	2115	2245	2260
9	1865	1895	2120	2120	2195	2280
10	1865	1955	2115	2120	2180	2290
Mean ±SE	**1824.4 ±20.26^e**	**1922.5 ±15.29^d**	**2111.0 ±12.31^c**	**2139.0 ±6.65^c**	**2219.5 ±7.04^b**	**2269.0 ±5.76^a**

Superscripts among the mean values indicates significant ($p<0.05$) difference from one another.

Lymphocytes (%)

Influence of varying age and sex on platelets count of Pateri goat breed of Sindh is mentioned in Table XIV. According to statistical analysis of data the difference in platelets count among the varying age and sex groups were significant ($p<0.05$). Significantly higher level of lymphocytes count (73.03%) was determined in group F as compared to group E (67.41%), D (60.07%), C (52.02%) and B (45.88%), correspondingly. Lower level of lymphocytes count (44.41%) was determined in group A

Table XIV.Influence of varying age and sex on lymphocytes count (%) of Pateri goat breed of Sindh

Animals	Group A (male kid)	Group B (female kid)	Group C (young male)	Group D (young female)	Group E (adult male)	Group F (adult female)
	3-5 m	**3-5 m**	**6-10 m**	**6-10 m**	**11-15 m**	**11-15 m**
1	44.8	45.4	50.2	60.1	61.7	72.1
2	44.7	44.9	50.1	60.3	61.2	71.2
3	44.2	45.8	49.8	60.5	60.9	70.9
4	44.3	45.7	49.7	60.9	70.2	74.1
5	44.5	45.9	48.7	59.9	71.1	74.2
6	44.6	45.8	49.3	59.7	70.7	73.9
7	43.8	46.1	50.2	60.2	70.9	74.4
8	43.9	46.2	50.6	60.4	69.8	73.8
9	44.7	46.4	50.7	58.8	68.7	72.9
10	44.6	46.6	50.9	59.9	68.9	72.8
Mean ±SE	**44.41 ±0.11^e**	**45.88 ±0.15^e**	**50.02 ±0.21^d**	**60.07 ±0.17^c**	**67.41 ±1.36^b**	**73.03 ±0.40^a**

Superscripts among the mean values indicates significant ($p<0.05$) difference from one another.

Monocytes (%)

Influence of varying age and sex on monocytes count of Pateri goat breed of Sindh is mentioned in Table XV. According to statistical analysis of data the difference in monocytes count among the varying age and sex groups were significant ($p<0.05$). Significantly higher level of monocytes count (11.14%) was determined in group F as compared to group E (8.80%), D (7.24%), C (6.54%) and B (5.27%), correspondingly. Lower level of monocytes count (4.20%) was determined in group A.

Table XV.Influence of varying age and sex on monocytes count (%) of Pateri goat breed of Sindh

Animals	Group A (male kid)	Group B (female kid)	Group C (young male)	Group D (young female)	Group E (adult male)	Group F (adult female)
	3-5 m	**3-5 m**	**6-10 m**	**6-10 m**	**11-15 m**	**11-15 m**
1	4.1	5.1	6.1	7.1	8.1	10.1
2	4.5	4.9	5.9	7.2	7.9	10.3
3	3.9	5.2	6.2	7.1	8.3	10.9
4	3.8	5.7	6.3	6.9	8.8	11.1
5	4.3	4.7	6.7	7.1	7.9	11.2
6	4.6	5.9	6.9	7.3	9.1	11.5
7	4.7	5.2	6.9	6.9	9.4	11.4
8	4.1	5.1	6.7	7.7	9.3	11.2
9	4.2	5.3	6.8	7.8	9.4	11.9
10	3.8	5.6	6.9	7.3	9.8	11.8
Mean ±SE	**4.20 ±0.10^{f}**	**5.27 ±0.11^{e}**	**6.54 ±0.11^{d}**	**7.24 ±0.09^{c}**	**8.80 ±0.22^{b}**	**11.14 ±0.18^{a}**

Superscripts among the mean values indicates significant ($p<0.05$) difference from one another.

Red cell distribution (%)

Influence of varying age and sex on red cell distribution of Pateri goat breed of Sindh is mentioned in Table XVI. According to statistical analysis of data the difference in red cell distribution among the varying age and sex groups were significant ($p<0.05$). Significantly higher level of red cell distribution (30.88%) was determined in group F as compared to group E (29.47%), D (28.45%), C (27.42%) and B (26.40%), correspondingly. Lower level of red cell distribution (25.39%) was determined in group A.

Table XVI.Influence of varying age and sex on red cell distribution (%) of Pateri goat breed of Sindh

Animals	Group A (male kid)	Group B (female kid)	Group C (young male)	Group D (young female)	Group E (adult male)	Group F (adult female)
	3-5 m	**3-5 m**	**6-10 m**	**6-10 m**	**11-15 m**	**11-15 m**
1	25.3	26.1	27.2	28.1	29.1	30.1
2	25.2	25.9	27.1	28.2	29.7	30.2
3	25.4	26.3	27.3	27.9	28.9	31.1
4	25.3	26.9	27.4	28.3	29.2	30.8
5	25.4	26.8	27.9	28.9	29.1	30.9
6	25.8	26.7	27.8	28.4	30.1	31.1
7	25.1	26.7	27.7	28.9	29.9	31.2
8	24.9	26.9	27.1	28.7	29.8	31.7
9	25.8	25.8	27.2	28.6	29.7	30.8
10	25.7	25.9	27.5	28.5	29.2	30.9
Mean ±SE	**25.39 ±0.09^{f}**	**26.40 ±0.14^{e}**	**27.42 ±0.09^{d}**	**28.45 ±0.10^{c}**	**29.47 ±0.13^{b}**	**30.88 ±0.14^{a}**

Superscripts among the mean values indicates significant ($p<0.05$) difference from one another.

MPV (%)

Influence of varying age and sex on MPV of Pateri goat breed of Sindh is mentioned in Table XVII. According to statistical analysis of data the difference in MPV among the varying age and sex groups were significant ($p<0.05$). Significantly higher level of MPV (16.17%) was determined in group F as compared to group E (15.40%), D (14.98%), C (14.32%) and B (13.57%), correspondingly. Lower level of MPV (12.85%) was determined in group A.

Table XVII.Influence of varying age and sex on MPV (%) of Pateri goat breed of Sindh

Animals	Group A (male kid)	Group B (female kid)	Group C (young male)	Group D (young female)	Group E (adult male)	Group F (adult female)
	3-5 m	**3-5 m**	**6-10 m**	**6-10 m**	**11-15 m**	**11-15 m**
1	12.9	13.1	14.1	15.1	15.8	16.1
2	12.8	13.9	14.7	15.2	15.2	16.3
3	13.1	13.8	14.1	14.8	15.9	16.2
4	12.2	13.6	14.4	14.9	15.4	16.1

5	12.6	13.5	14.2	15.4	15.2	15.9
6	12.1	13.6	14.5	15.2	15.1	16.4
7	13.3	13.8	14.2	15.1	15.2	16.1
8	13.4	13.9	14.6	14.9	15.4	16.3
9	13.2	13.4	14.1	14.4	15.3	16.2
10	12.9	13.1	14.3	14.8	15.5	16.1
Mean ±SE	**12.85 ±0.13^{f}**	**13.57 ±0.09^{e}**	**14.32 ±0.06^{d}**	**14.98 ±0.08^{c}**	**15.40 ±0.08^{b}**	**16.17 ±0.04^{a}**

Superscripts among the mean values indicates significant ($p<0.05$) difference from one another.

DISCUSSION

In order to determine the health condition of particular animals, blood is an effective and accurate medium. Variations in animal blood parameters are attributed to many variables, such as altitude, feeding intensity, age, sex, ethnicity, diurnal and seasonal variation, animal temperature and physiological condition (Ramprabhu *et al*., 2010). Hematological and serum biochemical testing are commonly used to detect severe animal disorders that may contribute to economic losses in livestock, such as diminished development of fur, fibre and milk (Ismail *et al*., 2008). The physiological and haematological values of the Pateri goat were located inside standard ranges, according to the current research. Such reports are backed by others previously recorded (Piccione *et al*., 2010; Olayemi *et al*., 2009; Rice and Hall, 2007). In the arid region, age and sex have been documented to impact the haematological values of goats in Egbe-Nwiyi *et al*. (2000); Zumbo *et al*. (2011) and Zamfirescu *et al* (2009). Hematological parameters in goats may also be affected by illness (Sulaiman *et al*., 2010). The haematological blood parameters may indicate physical changes occurring in the body of an animal, such as RBCs, Hb, WBCs. Such modifications may be attributed to conditions or natural changes in physiology. The material responsible for delivering oxygen to body tissues and eliminating waste carbon dioxide is haemoglobin. It also plays a significant part in protecting the blood's pH. Transport RBCs Hb. Hb or RBC reduction contributes to low O2 in the tissues, producing short air, a sign of anaemia. WBCs, or leukocytes, protect the body from foreign particle invasions. It is necessary to use their numbers to identify the involvement of infections in the blood of ill animals. In this research, the shift in age values of all haematological parameters in rising children is compatible with other studies that either contrasted groups of young and adult goats (Daramola *et al*., 2005 and Pampori *et al*., 2010), goats of several age groups and sheep (Tibbo *et al*., 2004; Simsek *et al*., 2005) or examined improvements in growing animals such as calves and swine (Anton, A. and Pavel, 2009). The decrease in Hb and PCV values from birth to three weeks of age and the corresponding rise to previous values reported in this study is comparable to that reported by Mbassa and Poulsen in neonatal Dwarf and Landrace infants (1991). The mean values of all parameters in Omani children were comparable at an early age to those stated by Gutierrez, *et al*. (1999) in Canary goat children aged 1 week. However, only the PCV values were equal to those of the white German and coloured German noble breeds at around three months of age (Frank *et al*., 2000).

RBC, Hb, MCH and MCHC levels were higher, while MCV and WBC were lower for Omani children than for German breeds. Hb was comparable to Barbari male goats at 9-12 months of age at the end of the study span, i.e. at the age of 25 weeks, with other goats, lower than the mean value of adult West African Dwarf goats and within the goat range given by the Merck Veterinary Manual (2009). On the other hand, in 25-week-old Omani baby, RBCs, MCHC and WBCs were higher while PCV, MCV and MCH were lower than the values recorded by Sharma, *et al*., (2002) Daramola *et al*., (2005) and the Merck Veterinary Manual (2009). Many variables, including variations in environment, lifestyle, management method and ethnicity, may be due to the differences between values obtained in the present study and other studies (Ukanwoko *et al*., 2013). In the current research, the above cause is verified, as goats of all races have been raised under the same conditions. In Ethiopia, Bangladesh, Northern Nigeria and Mubi Adamawa State of Nigeria, breeding variations in haematological values were also found in other goats (Olayemi *et al*., 2009; Ifutt *et al*., 2011; Olayemi *et al*., 2000 and Imasuen *et al*., 2013). Sex also affected RBC, Hb and PCV in the latter study. This was in comparison to the Tibbo *et al*. (2004) research, which found slightly higher PCV and RBC values in males than females in Ethiopian indigenous goats but no noticeable sexual impact on MCHC or WBC and reports from Egbenwiyi *et al*. (2000) of higher RBC, PCV and MCV values in male goats between birth and 7 years. Similarly, in Kanni Indian goats, Ramprabhu *et al*. (2010) recorded that males had greater Hb, PCV, RBC and WBC values. In the other side, in neonatal Dwarf and Danish Landrace children and West African Dwarf goats, sex did not impact haematological parameters in (Mbassa and Poulsen, 1991). Another research by Opara *et al*. (2010) on the same West African Dwarf goats from various age classes, however, recorded greater WBC in males than in females.

CONCLUSION

On the present scenario, it is concluded thatPhysiological observations like pulse rate, respiration rate and rectal temperature were fluctuated among the different age and sex of goats.Numerically the maximum values of all blood parameters were determined in group F (adult female of 11-15 months age).

ACKNOWLEDGEMENTS
The research work was accomplished by utilizing budget of Department of Veterinary Physiology and Biochemistry, Sindh Agriculture University Tandojam, Pakistan**.** *Statement of conflict of interest* The mentioned authors have declared no conflict of interest.

CONTRIBUTION
MA, ABK, ZUR and SAS conceived and designed the experiments .MA performed the experiments. JK, HB, NA and RMD analyzed the data. ZUA, HZ, SA and SN revised the manuscript .MA, MBK, MMA and TA wrote the manuscript.

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