J. Agric. Sci. Mansoura Univ., 30 (6): 3013 - 3023, 2005

SOME CHARACTERISTICS OF THE BALADI GOATS COAT DURING AUTUMN AND WINTER SEASONS

Hekal, Samia A. A.
Desert Research Center, Matareya, Cairo, Egypt

ABSTRACT

Twenty adult Baladi does, raised at the Desert Research Station at Maryout (35 km. southwest of Alexandria), were used during autumn and winter seasons, to study the characteristics of hair coat cover (fibre length, fibre type ratio recorded monthly from six different body regions; wither, hip, back, shoulder, mid-side and Britch; as well as histological changes in the skin to estimate secondary/primary ratio as affected by season. Skin samples were taken from the mid-side of each animal twice; once in autumn (November) and the second in winter (February) seasons. The histological study confirmed that hair follicles were found to be arranged in groups consisting of three primaries and a variable number of the secondaries. Results revealed that season had a significant effect ($p<0.05$) on secondary/ primary follicles ratio (S/P ratio) with values being 3.47 vs. 5.00 in winter and autumn seasons, respectively. Also, season, stage of season and body surface regions had a highly significant ($P<0.01$) effect on both coat fibre types and fibre length. General increment of the under coat fibre percentage within months of the two seasons as well as reversible trend related to the outer coat fibre type ones has been observed.

Results indicated a tendency of medullated fibre types A, B to increase ($P< 0.001$) from the mid stage of autumn to winter season as well as clear reduction in under coat fibre percentages. Type C, the third class of the outer coat, showed highly significant percentages in both autumn (21.9 ± 0.594) and winter (24.2 ± 0.567) seasons while type D was represented only in autumn season.

The under coat fibres were found to be 12.7 and 30.1 % in both autumn and winter seasons, respectively with the highest % (41.9%) in the last stage of winter. The under coat fibres were fine with an average fibre length of 0.6 cm with 3.8 crimps/cm in winter versus 0.3cm with 1.6 crimps/cm in autumn. Likewise, body surface regions affected ($P<0.05$) percentages of coat type. Both wither and hip represented an increase ($P<0.05$) in the outer coat percentages accompanied by a significant decrease ($P<0.05$) in the under coat percentages.

Keywords: Goats, Hair follicle, seasonal variations, S/P ratio

INTRODUCTION

Goats are believed to have the widest ecological range of domestic livestock, ranging from extremes of tropical rain forests to dry deserts where sheep cannot exist (Gordon, 1997). Goats have a higher ability to survive under unfavorable conditions and exceed sheep and cattle in their tolerance (Shelton 1977). Skin and coat cover of an animal act as an integument barrier as well as a medium through which animals are in continuous contact with their surrounding environments. The double hair coat and the incidence of medulla in the outer coat are of great importance in helping animals to be more tolerant. The under coat fibres with their crimps and low thickness furnish good insulative capacity of the coat especially during cold weather. Medullated fibres are believed to play an important role in thermoregulation during hot weather conditions. The relatively low S/P ratio of Baladi goats

usually contributes hair coat characteristics. The present study aimed to investigate the characteristics of the coat cover of Baladi goats during autumn and winter seasons.

MATERIALS AND METHODS

This study was carried out on twenty adult Baladi goat does raised in Maryout Research Station (35 kilometers southwest of Alexandria) of the desert Research center. Skin Samples were taken during autumn (November) and winter (February) from the mid-side position of each animal and fixed in calcium formal for about 24 hours (Barker 1958). Specimens were dehydrated in an ascending series of ethanol (30 minutes in each of 70%, 80%, 90% and changed twice for 15 minutes in absolute ethanol. The specimens were cleared in benzene for about 30 minutes, infiltrated in paraffin wax at 60 C (4 changes, 20 minutes each) and embedded in the same paraffin wax to prepare the blocks. Sections of 6-8 microns in thickness were prepared and stained by Haematoxylin and Eosin (Drury and Wallington, 1980). From microscopical examination, S/P ratio was calculated.

Hair samples were obtained monthly from six body regions (wither, hip, back, shoulder, mid-side and Britch) during autumn (October, November and December) and winter (January, February and March) seasons.

In each sample, 300 fibres were randomly counted as outer and under coat within each season, according to the length and thickness of the fibres. The number of crimps per cm and fibre length were assessed in the under coat. The outer coat included all long and coarse fibres that were divided into 4 grades according to medulla percentages (A , B, C and D) of fibres types with 90, 70, 50 and 30 % medulla, respectively.

The data were statistically analyzed according to SAS (1995) using general Linear Models classification followed by Duncan's multiple range test to examine the significance level between means.

RESULTS AND DISCUSSIONS

From the microscopic observation, the hair follicles were arranged in groups in the skin where each one consisted of three primaries and a variable number of the secondaries. Primary follicles were usually larger than the secondaries and associated with sudoriferous and sebaceous glands and an arector pili muscle. Secondaries were associated with only sebaceous gland (Figures 1 & 2). Values of S/P ratio were reported to indicate coat cover density and subsequently reflect its role in thermoregulation. Results of mean values of S/P (Table 1) revealed that season had a significant effect ($p<0.05$) on S/P ratio with values being 3.47±0.176 and 5.00 ± 0.196 in winter and autumn seasons, respectively.

Table1. Average values of S/P ratio throughout the two seasons.

Season	S/P Ratio*
Autumn	5.00 ± 0.196 b
Winter	3.47 ± 0.176 a

S/P ratio, number of secondary to primary follicle. Means with different letters differ significantly at P<0.05

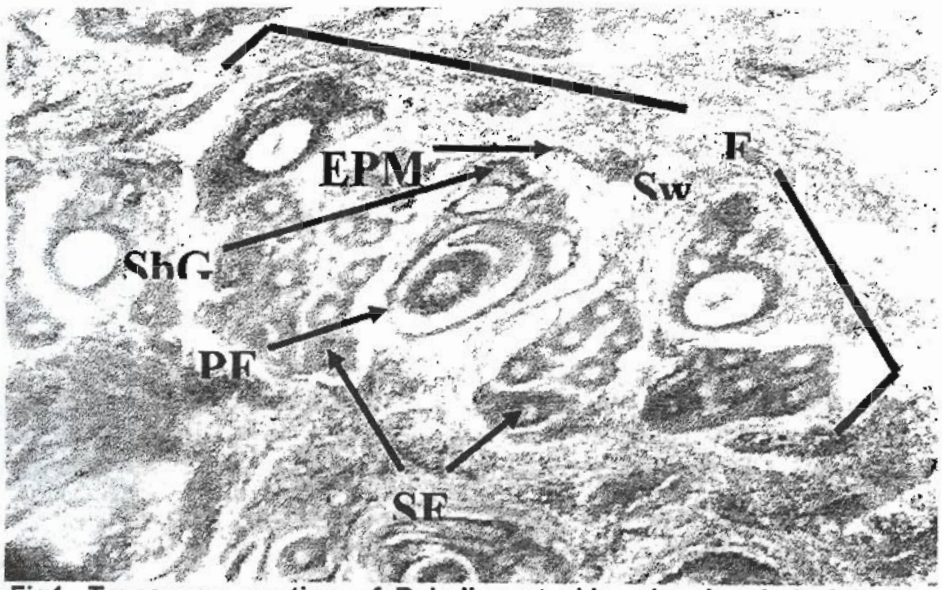
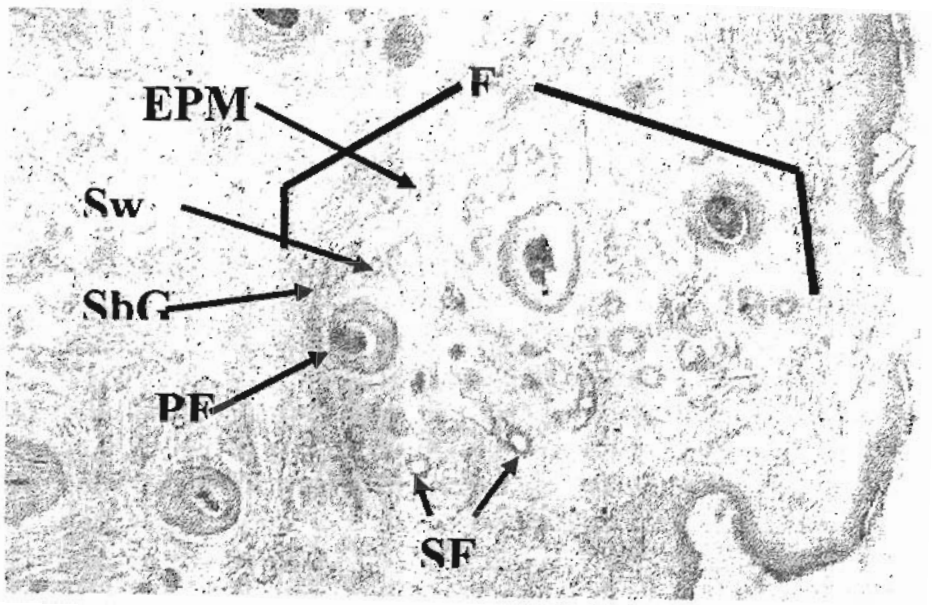


Fig1. Transverse section of Baladi goat skin, showing hair follicles arranged in trio groups (FG) in autumn season. PF, Primary follicle; SF, Secondary follicle; SwG, Sweat gland; SbG, Sebaceous gland; EPM, Erector pili muscle. (HX.E. X100)



(Fig2): Transverse section of Baladi goat skin, showing hair follicles arranged in trio groups (FG)in winter season. PF, Primary follicle; SF, Secondary follicle; SwG, Sweat gland; SbG, Sebaceous gland; EPM, Erector pili muscle. (HX.E.X100)

The present results were in accordance with those of El-Ganaieny and Abdou (1999), who reported a value of 3.27±0.130 in winter. However, these results were below those reported for both Angora (8-9) and pashmina goats (4.6) according to Dreyer and Marincowitz, (1967); Clark and Smith (1975); and Bhatnagar *et.al* (1987). On the other hand, Henderson and Sabine (1991) observed a slight fall in S/P ratio in mid winter which was the usual time at which shedding occurred in adult animals in that environment.

The low S/P ratio recorded for Baladi goats might be considered as one of the adaptive features to hot arid conditions where sensible heat loss is desired to control body temperature regulation (El-Ganaieny and Abdou, 1999).

Season, stages of season and body surface regions had a highly significant (P<0.01) effect on both coat fibre types and fibre length (Table 2 and 3). Results encountered revealed that the under coat fibres contributed 31.4 and 11.5 % during winter and autumn seasons, respectively (Table 4).

Table (2): Analysis of variance for different factors affecting Fibre type ratios.

Source	DF	Mean Square					
		A	B	C	D	Crimp	Inner
Season	1	11562.240**	2865.493**	604.852**	7098.728**	628.065**	49334.7**
Stage	2	920.347**	2942.991**	418.735**	3825.426**	173.470**	25108.9**
An	39	544.70**	475.285**	520.102**	66.348**	32.098**	2903.6**
Position	5	1568.258**	291.811**	783 228**	182 315**	23.771**	1705.2**
Se*Po	5	594 734**	166.936	141.078	182.315**	5.864	635.8*
Se*St	2	270.097	2004.473**	1056.216**	3434.927**	36.799**	318.3
Residual	617	81.374	89.629	74.737	28.413	6.294	237.3

A; 90% medulla. B; 70 % medulla. C; 50 % medulla. D; 30 % medulla *; P<0.05. **; P<0.01
Se*Po; season x position interaction. Se*St; season x stage interaction

Table (3): Analysis of variance for different factors affecting fibre length.

Source	DF	M.S				
		A	B	C	D	Inner
Season	1	515.66**	271.493**	27.341**	135.866**	17.912**
Stage	2	103.102**	40.714**	3.252**	80.008**	9.016**
Animals	39	4.443**	6.906**	2.325**	0.810**	1.398**
Position	5	2.036*	0.484	0.414	0.618	0.946**
Se*Po	5	0.830	0.748	0.842	0.618	0.274**
Se*St	2	3.242**	0.089	10.238**	71.993**	0.387*
Residual	617	0.749	0.634	0.427	0.300	0.093

A; 90% medulla. B; 70 % medulla. C; 50 % medulla. D; 30 % medulla *; P<0.05. **; P<0.01
Se*Po; season x position interaction. Se*St; season x stage interaction

On the other hand, the distribution of the undercoat fibre percentage along the different body regions as shown in Table (5) recorded a higher percentage on the dorsal regions compared to the lateral ones. The previous results were in harmony with those obtained by El-Ganaieny (1999) on Baladi goats, who recorded 34.1% of undercoat fibres in winter. El-Ganaieny *et al* (2001) also showed that the under coat fibres of goats represented 15.9 and 21.3% in winter and autumn respectively. The under coat increment in winter might be essential in body heat insulation in cold weather.

Table 4: Means (± SE) of fibre type ratio (FTR) and fibre length (FL) of Baladi goats during autumn and winter seasons.

Parameter	FTR		FL	
Season	Autumn	Winter	Autumn	Winter
A	26.5 ± 0.62 a	17.9 ± 0.59 b	5.0 ± 0 56 a	7.1 ± 0.05 b
B	31.0 ± 0.35 a	27.6 ± 0.62 b	4.3 ± 0 05 a	5.8 ± 0.05 b
C	21.7 ± 0.59 a	24.4 ± 0.56 b	3.2 ± 0 04 a	3.7 ± 0.04 b
D	8.1 ± 0.36 a	0.21 ± 0.34 b	1.1 ± 0.03 a	-------
Outer	87 3 ± 1.06 a	69.9 ± 1.06 b	3.4±0 032a	4.1±0 31b
Inner	12.7 ± 1.06 a	30.1 ± 1.06 b	0.3 ± 0.02 a	0.6 ±0.02b

A; 90% medulla. B; 70 % medulla. C; 50 % medulla. D; 30 % medulla
Means with different letters in the same row differ significantly at P<0.05

In New Zealand goats, Nixon *et al* (1991) found that under coat fibres were lost in spring and almost disappeared from the fleece in late October (autumn) , where new growth reappeared in January (winter). Likewise, Kassab and Stegenga (1965) observed seasonal change in coat fibres of Friesian calves. In the camel, Guirgis *et al* (1992) showed that under coat fibres were higher in winter and tended to decrease towards autumn, which proved that the coat acts as insulator against potential transfer of body heat to the cold environment and *vice versa* during the summer.

The outer coat fibres (long and coarse) were divided into four types A, B, C and D according to the medulla thickness. Type A fibres showed higher value in autumn (26.5 ± 0.62) than winter (17.9 ± 0.59). Results (Table 4) were in accordance with those of El Ganaieny (1999) for Baladi goat bucks. Furthermore, the dorsal regions (withers, back and hip) had the highest percentages of type A compared with the lateral ones (shoulder, mid side and britch) as reported in Table (5).

Type B fibres showed higher overall mean values in autumn 31.0 than that of winter 27.6. The hip position showed high percentage of type B (31.8) while homogeneously distributed along the other body regions. Table 4 indicated that type C, the third class of the outer coat fibres, recorded highly significant percentages in both autumn (21.7 ± 0.594) and winter (24.4 ± 0.567). On the other hand, the overall mean value of this type of fibres varied from higher percentages in the britch region (27.4) to lower percentages in that of the hip (20.3) (Table 5).

Table (5): Mean fibre type ratio ± SE in different positions at both autumn and winter seasons

Fibre types	Positions	Wither	Back	Hip	Shoulder	Mid side	Britch	Overall mean
A	Autumn	29.6±1.42	27.2±1.42	35.8±1.42	19.5±1.42	22.1±1.42	23.1±1.42	26.5^{a}
	Winter	19.8±1.37	18.1±1.37	19.1±1.37	14.5±1.37	17.1±1.37	18 2±1.37	17 9^{b}
	Mean	24.8^{ab}	22.8^{bc}	27.3^{a}	17.1^{e}	19.7^{cde}	20.7^{cd}	
B	Autumn	30.3±1.45	31.4±1.45	34.6±1.45	30.1±1.45	28.5±1 45	30.1±1.45	31.0^{a}
	Winter	30.6±1.39	25.7±1.39	28.9±1.39	25.9±1.39	27.6±1 39	25 6±1.39	27 6^{b}
	Mean	30 7^{abc}	28.7^{b}	31.8^{a}	28.2^{b}	28.0^{b}	28.0^{b}	
C	Autumn	20.5±1.37	20.3±1.37	18.2±1.37	25.2±1.37	21.3±1.37	24.6±1.37	21.7^{b}
	Winter	25.3±1.31	21.0±1.31	22.0±1.31	24.6±1.31	22.8±1.31	29.6±1.31	24.4^{a}
	Mean	23.1^{bc}	20.8^{c}	20.3^{c}	24.9^{ab}	22.0^{c}	27.4^{a}	
D	Autumn	7.1±0.75	5.1±0.75	4.6±0.75	11.0±0.75	6.8±0.75	9.3±0.75	8 1^{a}
	Winter	———	———	———	———	———	———	———
	Mean	3.8^{bc}	2.8^{c}	2.5^{c}	5.7^{a}	3.7^{bc}	4.9^{ab}	
Outer	Autumn	87.6±2.73	84.1±2.73	93.3±2.73	85.9±2.73	78.8±2.73	87.3±2.73	87.3^{a}
	Winter	75.8±2.62	65.0±2.62	70.1±2.62	65.1±2.62	67.2±2.62	73.4±2.62	69.9^{b}
	Mean	82.4^{a}	75.2^{c}	81.9^{a}	75.9^{bc}	73.4^{c}	80.9^{ab}	
Inner	Autumn	12.3±2.73	15.8±2.73	6.6±2.73	14.1±2.73	21.2±2.73	12.6±2.73	12.7^{b}
	Winter	24.2±2.62	34.9±2.62	29.8±2.62	34.8±2.62	32.7±2.62	26.5±2.62	30.1^{a}
	Mean	17.6^{c}	24.8^{a}	18.1^{c}	24.1^{ab}	26.6^{a}	19.1^{bc}	

A; 90% medulla. B; 70 % medulla. C; 50 % medulla. D; 30 % medulla. Means with different letters in the same row differ significantly at P<0.05

The fourth type of outer coat fibre (D) was represented only in autumn season (8.1 ± 0.36). The distribution of the type D fibres along the whole body of the animal was homogeneously observed whereas, Table 5 clarified that the lateral line of the body had a higher percentages of fibre type D than those of the dorsal ones. Generally, in both autumn and winter seasons there was a gradual decrease in the outer coat fibre percentage from the first stage reaching the lowest ratio in the third stage (Table 6). On contrary, the under coat fibre percentage showed an increasing trend parallel to that of the outer coat fibre at the same season stages (Table 6). Figure 3 also showed the general increment of the outer coat fibre percentage along the stages of the two seasons and the reversible trend which related to the outer coat fibre ones. The same trend was also detected in the averages of the fibre length in both outer and under coats found in all different season stages (Table 7).

There was a tendency of medullated fibre types A, B to increase ($P< 0.01$) from autumn to winter season as well as clear reduction in under coat fibre percentages. Similar findings were also reported by El- Ganaieny (1999). El-Ganaieny (1996) attributed such increase in the outer coat ratio in

different goat fleeces (Maryout and Kostal) to the nature of the outer coat as being highly medullated and sparse thus assisting heat dissipation from body in the prevailing hot conditions.

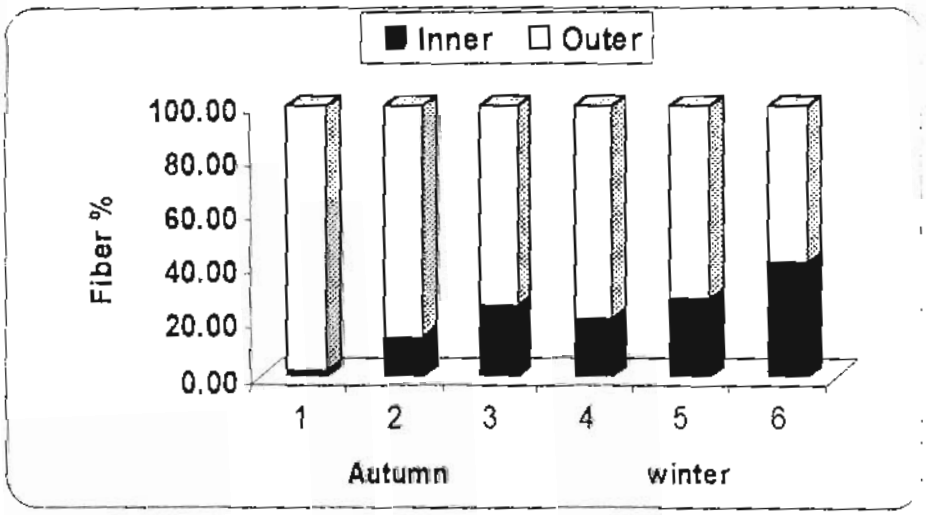


Fig 3: Percentage of inner and outer coat fibre at different stages of both autumn and winter

Likewise, Guirgis and El-Ganaieny (1998) confirmed the previous results in goats raised at the extreme south East of Egypt (Halaib, Abou-Ramed and Shalateen triangle). Results were in accordance with those of El-Ganaieny (1999) who recorded 34.1%of under coat fibres in winter in goat buck.

The distribution of under coat fibres along the different stages of the two seasons is represented in Fig 3. Results demonstrated that the highest percentage of the under coat fibres (41.9 ± 1.72) was found to be in the last stage of winter (Table 6) so, the under coat fibres could be harvested at late winter.

The under coat fibres were fine with an average fibre length of 0.6 cm with 3.8 crimps/cm in winter and 0.3 cm with 1.6 crimps/cm in autumn (Table 4). However, these results were below those reported by El- Ganaieny (1999) and El-Ganaieny *et al.* (2001). They recorded1.1 cm with 3.6 crimps/cm in Baladi goats. On the other hand, Guirgis *et al* (1992) reported an increase in crimps/cm of under coat fibres, in the dromedary camel, during winter season, thus increasing insulating capacity through holding more of still layer of air.

Table 6. Means (± SE) of fibre type ratio of Baladi goats during stages of autumn and winter seasons.

Season	Autumn			Winter		
	October	November	December	January	February	March
A	27.1±0.96	30.2±0.98	24.6±1.11	19.9±0.95	18.2±0.96	14.9±1.01
B	30.2±1.00	34.7±1.03	28.9±1.17	33.4±1.00	27.0±1.00	19.2±1.06
C	24.1±0.92	19.1±0.94	22.7±1.07	25.2±0.91	26.8±0.92	20.6±0.97
D	17.4±0.56	4.8±0.58	0.35±0.65	----------	----------	----------
Outer	98.1±1.82	85.9±1.87	74.5±2.10	79.1±1.82	71.9±1.82	58.1±1.92
Inner	1.8±1.64	14.1±1.67	25.5±1.90	20.9±1.63	28.1±1.63	41.9±1.72

A; 90% medulla. B; 70 % medulla. C; 50 % medulla. D; 30 % medulla

Table 7. Means ± SE of fibre length of Baladi goats during stages of autumn and winter seasons.

Season	Autumn			Winter		
	October	November	December	January	February	March
A	4.3 ± 0.09	5.2 ± 0.09	5.7± 0.09	6.4± 0.09	6.9 ± 0.09	7.1± 0.09
B	4.4 ± 0.08	4.9 ± 0.08	4.9 ± 0.08	5.3 ± 0.08	5.9 ± 0.08	6.3 ± 0.08
C	3.4 ± 0.07	3.1± 0.07	3.2 ± 0.07	3.3 ± 0.07	3.7± 0.07	4.1± 0.07
D	2.5 ± 0.05	0.6 ± 0.05	———	----------	----------	----------
Outer	3.5 ± 0.05	3.3 ± 0.05	3.4 ± 0.06	3.6 ± 0.05	4.1± 0.05	4.6 ± 0.05
Inner	0.01± 0.03	0.3 ± 0.03	0.5 ± 0.03	0.4 ± 0.03	0.6 ± 0.03	0.9 ± 0.03

A; 90% medulla. B; 70 % medulla. C; 50 % medulla. D; 30 % medulla

Likewise, body surface regions affected ($P<0.05$) percentages of coat type. Both wither and hip represented a significant increase in the outer coat percentages accompanied by a significant decrease in the under coat percentages.

El-Ganaieny (1999) observed higher percentages of shed fibres on dorsal regions compared with lateral ones. Results of Table (8) revealed no significant difference in outer coat fibre length among different positions. Moreover, fibre type D was found only in autumn season.

Dorsal positions reflect the highest fibre length as compared to lateral ones with values being insignificant. Britch showed the longest fibre length while withers showed the shortest length.

Meanwhile, the back and mid-side positions represents the highest under coat fibres length than other positions. On the other hand, Hekal (2001) concluded that, during the hottest months (summer-autumn) the under

coat fibres tended to disappear and a new growth renewed during early autumn and markedly increased towards the end of winter season where it could easily be harvested.

The absence and renewed under coat fibre might reflect a role of the coat cover in thermoregulation and survival rate under the prevailing harsh condition. That would dominate under the semi arid condition.

Table (8): Mean fibre length ± SE in different positions at both autumn and winter seasons

Fibre types	Positions	Wither	Back	Hip	Shoulder	Mid side	Breech	Overall mean
A	Autumn	4.9±0.13	4.9±0.13	5.0±0.13	5.2±0.13	5.1±0.13	5.2±0 13	5 0 ^{a}
	Winter	6.8±0.12	7.0±0.12	7.1±0.12	6.9±0.12	7.3±0.12	7 3±0 12	7 1 ^{a}
	Mean	5.9^{b}	6 0^{ab}	6.1^{ab}	6.1^{ab}	6.2^{a}	6.3^{a}	
B	Autumn	4.2±0.12	4 2±0.12	4.2±0 12	4 4±0.12	4 4±0.12	4.3±0.12	4.3^{b}
	Winter	5.7±0.11	5.8±0.11	5.9±0 11	5 6±0.11	5 7±0.11	5.8±0.11	5.8^{a}
	Mean	4.9^{a}	5.1^{a}	5.1^{a}	5.0^{a}	5 1^{a}	5.1^{a}	
C	Autumn	3.1±0.10	3.1±0.10	3 0±0.10	3.1±0.10	3.1±0.10	3.2±0.10	3 2^{a}
	Winter	3 6±0.09	3.6±0.09	3.7±0.09	3.4±0.09	3.8±0.09	3.6±0 09	3.7^{b}
	Mean	3.4^{a}	3.5^{a}	3.4^{a}	3 3^{a}	3.5^{a}	3.5^{a}	
D	Autumn	1.1±0.07	0.8±0.07	0.9±0.07	1.2±0.07	0.9±0 07	1.0±0.07	1.1^{a}
	Winter	----	----	----	----	----	----	----
	Mean	0.6^{ab}	0.5^{b}	0.5^{b}	0.7^{a}	0.5^{b}	0.6^{ab}	
Outer	Autumn	3.4±0.07	3.4±0.07	3.3±0.07	3 5±0.07	3.5±0.07	3.5±0.07	3.4^{b}
	Winter	4.0±0.07	4.1±0.07	4.2±0.07	4.0±0.07	4.2±0.07	4 2±0.07	4.1^{a}
	Mean	3.7^{a}	3.8^{a}	3.8^{a}	3.8^{a}	3.9^{a}	3.9^{a}	
Inner	Autumn	0.2±0.06	0.4±0.06	0.1±0.06	0.3±0.06	0 4±0.06	0.3±0.06	0.^{a}
	Winter	0.5±0.05	0.8±0.05	0.6±0 05	0.6±0.05	0.7±0.05	0.6±0 05	0.6^{b}
	Mean	0.4^{a}	0.6^{a}	0.4^{a}	0.5^{a}	0 6^{a}	0.4^{a}	

A; 90% medulla. B; 70 % medulla. C; 50 % medulla. D; 30 % medulla. Means with different letters in the same row differ significantly at P<0.05

REFERENCES

Barker, J. R.(1958). Principles of biological technique. London, Meunchen, New York, John Wiley. Bancrooft.J.D.

Bhatnagar,V. Garth S. G. and Bhattacharyya, K.. (1987). Histological studies of follicles in Pashmina goat proceedings of international conference goats. March 8 to131 Brazilla, Brazil.

Clarke,W.H. and Simth, I.D. (1975). Aprelimi evaluation of production and the potential of Angora goats in three eastern states. J. Aust. Inst. Agric Agic.Sci.41:220-224.

Dreyer, J. H. and Marincowiz, G. (1967). Some observations on the skin histology and fibre characteristics of the Angora goat (capra hircus Angoraensis).S.Afr.J.Agric.Sci.10:477-500.

El-Ganaieny,M.M and Abdou, A.S.A (1991). Ahistological study on skin hair follicles of Baladi goats Minufiya .J. of Agric. Res. Vol.24, No.2 (1):469-480.

El-Ganaieny,M.M, Khattab, F.L., Abdou, A.S. and Hekal, S.A. (2001). Hair coat characteristics in Baladi goats in relation with thermoregultion during the yearly seasons. Epypt. J. Anim. Prod. 38, 2: 111-127

El-Ganaieny,M.M.,(1996). Preliminary study on some hair characteristics of goats raised under two different environment in Egypt. J. Appl.Sci.,11 (2):226-236.

El-Ganaieny,M.M.,(1999). Physical characteristics of hair coat and its thermoregulation role in Baladi goats. Minufiya J.of Agric.Res. Vol.24 (1) : 143-157.

Gordon, I. (1997). Controlled reproduction in sheep and goats. CAB International, New York.

Guirgis,R.A. and El-Ganaieny, M.M.(1998). Some observations on the coat of small ruminants in the extreme south of Egypt. Egyptian J. Anim. Prod. 35, Suppl. Issue, Dec. 416-428.

Gurigs,R.A, El-Ganaieny, M.M,. Khidr, R.E.E, El-Sayed, N. A. and Abou El-Ezz, S.S. (1992). Camel hair, role in thermoregulation and as a speciality textile fibre.Egypt. J. Anim. Prod. 29, No.1:.61-72.

Hekal, S.A.A. (2001). Histological and histochemical studies on Baladi goats skin during different seasons of the year. Ph.D. Thesis, Faculty of Science, Ain Shams university.

Henderson, M. and Sabine, J. R. (1991). Secondary follicle development in Australian cashmere goats. Small Ruminant Research. 4, 349-363

Kassab, S. A and Stegenga, T.H. (1965). Hair growth in FH and MRY calves. Egypti. Anim. Prod. 5:11-16.

Nixon, A. J.; Gurnsey, M.P.; Betteridge, R. J.; Mitchell, R. J. and Welch, R. A. S.(19991). Seasonal hair follicle activity and fibre growth in some New Zealand Cashmere-Bearing goats (*caprus hircus*) J.Zool.Lond. 224:589-598.

S. A. S (1998). Statistical analysis system, STAT/user's guide, release 603 ed. SAS Institute, Cary NC. U. S. A.

Shelton. (1977). Management of production in the goat .In proceeding symposium in management of production in sheep and goats. Madison, Wisconsin, July 24-25, 134-139.

J. Agric. Sci. Mansoura Univ., 30 (6), June, 2005

بعض خصائص الغطاء الشعرى للماعز البلدى خلال الخريف والشتاء

سامية عبد المجيد عبد العال هيكل
مركز بحوث الصحراء -شعبة الانتاج الحيوانى والدواجن

استخدم فى هذة الدراسة ٢٠ انثى ماعز بلدى موجودة بمحطة بحوث مريوط التابعة لمركز بحوث الصحراء بهدف دراسة بعض خصائص غطاء الشعر للماعز البلدى خلال موسمى الخريف (اكتوبر نوفمبر ديسمبر) والشتاء (يناير فبراير مارس) حيث تم اخذ عينات شعر من عدد٦ مناطق من كل حيوان خلال موسمى الخريف والشتاء بالاضافة الى ٢ عينة جلد من منطقة وسط الجنب من كل الحيوانات مرة خلال الخريف (نوفمبر) والاخرى خلال الشتاء (فبراير) لعمل القطاعات الهستولوجية.

اوضحت النتائج ان للموسم تاثير معنوى على نسبة الحويصلات الثانوية الى الاولية وكانت القيم المتحصل عليها ٣,٤ فى الشتاء مقابل ٥,٠ فى الخريف. كان هنال اتجاة عكسى فى نسبة تواجد كل من الغطاء الخارجى والداخلى يبدأ من الفترات الاولى فى الخريف وحتى نهاية الشتاء حيث يقل الغطاء الخارجى بزيادة الغطاء الداخلى.

كان للموسم ومناطق الجسم تاثيرا معنويا عاليا ($P<0.01$) على كل من طول الياف الغطاء الخارجى وكذلك انواعها حيث ازدادت النسبة المئوية لقيم النوع A فى الخريف عن الشتاء وكانت منطقة الـhip بها اعلى نسبة من النوع B فى حين ازداد النوع C فى الشتاء عن الخريف كما تلاحظ عدم وجود النوع D فى الشتاء بينما تواجد فى الخريف . بالنسبة للغطاء الشعرى للماعز بنوعية الداخلى والخارجى فقد اتجهت قيم النسب المئوية للالياف ذات النخاع من النوع A&B إلى للنقص من الخريف الى الشتاء مصحوبة بزيادة واضحة فى القيم الخاصة بالياف الغطاء الداخلى. بلغت النسبة المئوية لالياف الغطاء الداخلى ١٢,٧، ٣٠,١% فى كل من الخريف والشتاء على التوالى. كان متوسط اطوال الالياف فى الغطاء الداخلى ٠,٦ سم وعدد التموجات/سم ٣,٨ فى الشتاء مقارنة بـ ٠,٣، ١,٦ فى فصل الخريف وكان لمناطق توزيعها على الجسم تاثيرا معنويا.