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DETERMINING THE RELATIONSHIPS AMONG BOTH PRODUCTIVE AND REPRODUCTIVE PERFORMANCES AND SOME WOOL TRAITS IN BARKI SHEEP

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ABSTRACT: ***Barki sheep flock of 489 animals maintained on Mariout Research Station close to Alexandria were studied during three years to determine the relationships among productive and reproductive performances and some wool traits in Barki Sheep. Flock management was typical for commercial conditions in the area. The average number of matings per conception in Barki ewes was 1.31. Ewes of low Kemp score had significantly the lowest number of matings (1.24 ± 0.04) than those of medium Kemp (1.32 ± 0.03) and abundant Kemp (1.38 ± 0.05). Generally, it could be seen that correlation coefficients showed high values between Point of Break, length (POBL) with Point of Break , weight (POBW); Coarse fibres (CF%) with Fine fibres (-FF%) ; Medullation index (MI) with Fine fibres (-FF%) and Kemp fibres (KF%) with Medullation index (MI). Correlation coefficients were of medium magnitude between Resilience (RES) with Bulkiness (BUL) ; Staple Crimp (SC) with Fibre diameter (-FD) ; (SC) with (-KF%) and (MI); (RES) with (-KF%) and (-MI) ; (FD) with (-FF%) ; (FD) with (KF%) ; (FD) with (MI); (FF%) with Heterotype fibres (-HF%) ; (FF%) with (-KF%) ; (HF%) with (MI). Other correlation coefficients were of low magnitude . It could be concluded that selection for low values of fibre diameter could result in an increase in FF%, BUL and RES and a decrease in KF% and MI. These results also indicated that selection for hi gh values of bulkiness could result in an increase in FF%, RES and yield (r= 0.22) and a decrease in FD, KF% which might cause a decrease in wool production. Phenotypic correlation coefficients between some objective wool characteristics of Barki sheep and yarns properties were also studied .***

Key words: ***Barki sheep, Relationship , Productive , Reproductive , Wool characteristics and yarn properties.***

INTRODUCTION

Wool traits can be classified as objective and subjective traits. As their names suggest, objective traits are measured according to defined measurements. Subjective traits, on the other hand, are observed with the

use of scores. Increased wool production can result in undesirable responses because of the negative relationships that could exist between wool production and reproduction traits. An important goal for breeders should be to understand how to select for improved production as well as for reproduction rate. Recently, evidence became available that indicates genotypes with high wool production may have a low lamb production (Herselman *et al.* 1998; Cloete *et al.* 2002). Lamb production and performance of ewes were measured by three methods; average number of matting per conception, average number of kilograms born and average number of kilograms weaned per ewe joined. Improvement of live weight and objective wool traits have been an important breeding objective in sheep production systems worldwide. Olivier (1999) and Safari *et al*. (2005) however, indicated reproduction as being the most important aspect to be included into any sheep breeding enterprise. Such information is lacking from literature, while further investigations about their relationships with other traits of economic importance are also needed. This study was conducted to determine the relationships among productive and reproductive performance and some wool traits in Barki Sheep.

MATERIALS AND METHODS

Barki sheep Flock (489 animals) maintained in Mariout Research Station close to Alexandria were studied during three years. Flock management was typical for commercial conditions in the area .Sheep grazed Egyptian clover (Berseem; Trifolium alexandrinum) in addition to crop residues whenever available. A concentrate mixture (14%CP and 60%TDN) of 0.5 kg / head / day was given. One kg concentrate mixture consisted of 0.5 kg undecorticated cotton seed cake, 0.18 kg wheat bran, 0.15 kg yellow corn, 0.11 kg rice polish, 0.03 kg molasses, and 0.02 kg limestone and 0.01 kg common salt. During summer months, the animals received Berseem hay ad libitum. Drinking clean tap water was provided ad libitum twice daily. The yearly mating season usually starts in June and lambing occurs in November. Lambs are allowed to suckle their dams for about three months. Shearing occurs once a year, often in May. Yearlings are usually shorn at approximately 18 months of age. Ewes are allowed to stay in yards after coming back from grazing fields and they are kept indoors at night. Greasy fleece weight and the weight of its components, skirtings and fleece wool, are estimated immediately after shearing. Animals were grading and divided into six groups. Fleeces were separated into skirtings and fleece wool. Representive samples from fleece wool of each group were taken for the study of physical wool characteristics. Each animal was grading (El-Ganaieny, 1986) few days before shearing according to staple structure (open or dense), Fleece openness grade (easy to open (1), less medium (2), medium (3) or hard to open (4), Kemp score (no Kemp (1), few Kemp (2), moderate Kemp (3) or plentiful Kemp (4), Cotting level or Felting grade (no felting (1) less medium

(2) medium felting (3) or hard felting (4), Coat depth (length to nearest 0.5 cm.) and Belly cover's wool (%). Skirtings are considered as the beginning of clip preparation, where parts inferior to the average grade of the fleeces are removed, such as the belly, neck, tail colored wool and tags. The products of skirtings are termed as skirting and fleece wool (Guirgis, 1973a).

The system applied in this study was to class Barki wool according to staple structure and Kemp content into six grades as follows:

Staple structure / Kemp score	Open	Dense
Few or no Kemp	Group 1 (OK1)	Group 2 (DK1)
Medium Kemp	Group 3 (OK2)	Group 4 (DK2)
Plentiful Kemp	Group 5 (OK3)	Group 6 (DK3)

Measurement of staple strength : 30 greasy staples were chosen at random from each class to estimate staple strength (SS). Agritest staple breaker (Agritest Pty. Ltd.) was used to estimate staple strength. Staple strength was estimated by measuring the force required to break the staple and dividing this value (in Newtons) by the thickness of the staple (in kilotex). The thickness of a staple can be calculated by dividing the weight of soured staple by its length.

Measurement of staple elongation(EL) and point of break(POB): can be estimated in the same time when estimating staple strength, as follows:(a)Before cutting the staple, its length can be estimated.(b). After cutting the staple, the length and weight of the top can be measured and also the length and the weight of the base.

Elongation % = (length of tip (cm) + length of base (cm)/staple length) x100.

POBL (length) =length of tip (cm) / (length of tip (cm) + length of base (cm)).

POBW (weight) = weight of tip (g) / (weight of tip (g) + weight of base (g)).

Measurement of Bulkiness and Resilience: Scoured samples from each class were hand-carded using a hand carding board (strike). Ten grams of scoured and hand carded wool fibres were taken from each sample and inserted into the cylinder of the WRONZ loose wool bulkometer (Dunlop et. al., 1974). The reading was recorded (height of the wool mass in the cylinder) through the lens with a maximum pressure load of 30 gf / cm^2 (H_{30}) for 30 second and without load (10 gf / cm^2) (H_{10}). Loose wool bulk and resilience in cm^3/g, were calculated as follows: Bulk (specific volume) = 0.5 x H_{10} cm^3 / g.

Resilience = 0.5 x (H_{10} - H_{30}) cm^3 / g.

Where: 0.5 = 50 cm^2 (cell cross-sectional area) / 10 g (weight of wool sample).Prior to testing, the samples were conditioned in an atmosphere of

65 ± 2 % Rh at 20°c for at least 24 hours. The average of each class was taken as the mean of 20 samples.

Generalized linear model procedure on SAS (1995) was conducted on the above mentioned traits using the following model :

$Y_{ijklmn} = \mu + Y_i + S_j + A_k + T_l + K_m + B_n + e_{ijklmn}$

Where:

Y_{ijklmn} **= the observation of interest.**

μ **= the overall mean.**

Y_i **= the effect of ith years (i=1, 2,3).**

S_j **= the effect of jth sex (j=1, 2).**

A_k **= the effect of kth age of animals (k=1,5).**

T_l **= the effect of tth staple structure (l=1,2).**

K_m **= the effect of mth Kemp score (m=1,3).**

B_n **= the effect of nth Type of birth (n=1,2).**

e_{ijklmn} **= the random error effect.**

Simple correlation coefficients were calculated between each two parameters, on the raw materials only. Means between different groups were tested by Duncan test .

RESULTS AND DISCUSSION

The average number of matings per conception in Barki ewes was 1.31 (Table 1). With respect to staple structure, it could be observed that ewes of open staple structure had insignificantly lower value (1.28 ± 0.03) compared with that of dense structure (1.34 ± 0.03). Furthermore, ewes of low Kemp score had significantly the lowest numbers of matings (1.24 ± 0.04) than those of medium Kemp (1.32 ± 0.03) and abundant Kemp (1.38 ± 0.05). Meanwhile , average weight of lambs born per ewe in kilograms was 3,84 kg. Ewes of open staple structure produced lighter kilograms of lambs born (3.66 ± 0.07 kg) compared with those of dense structure (4.00 ± 0.09 kg). However, the difference was not significant (Table 1).

Furthermore, ewes of low Kemp score had insignificantly the highest value of lambs born in kilograms (3.94 ± 0,12) than those of medium Kemp (3.84 ± 0.08) and abundant Kemp (3.72 ± 0.09). On the other hand, Barki ewes had an average number of kilograms weaned of 18,79 kg. Saddick (1992) found values of 10,91, 11.62 and 14,14 kg of lambs produced at weaning per each ewe bred in groups of Ossimi ewes shorn once, twice and three times per year, respectively. Ewes of open staple structure weaned insignificantly lower kilograms of lambs born (17,98 ± 0,516 kg) compared with those of dense structure (19.49 ± 0,511 kg). Meanwhile, ewes with medium Kemp score had the highest value of lambs weaning weight (19.07 ± 0,529) than those of abundant Kemp (18.77 ± 0.628) and low Kemp (18.21 ± 0.745). However, differences were not significant .

Table (1): Least-squares means ± standard errors for numbers of mating per conception, Lambs born (kg) and Lambs weaned (kg)

Items	No.	Number of matings per conception (NOM)	No.	Lambs born (kg)	No.	Lambs weaned (kg)
µ	489	1.31 ± 0.02	339	3,84 ± 0,06	242	18,79 ± 0,37
Kemp score		*		NS		NS
Few	117	1.24 ± 0.04 [a]	85	3.94 ± 0.12	62	18.21 ± 0.75
Medium	276	1.32 ± 0.03 [ab]	192	3.84 ± 0.08	131	19.07 ± 0.53
Abundant	96	1.38 ± 0.05 [b]	62	3.72 ± 0.09	49	18.77 ± 0.63
Age (Years)		*		*		**
2	113	1.35 ± 0.05 [ab]	54	3.45 ± 0.14[a]	45	17.73 ± 0.65[a]
3	77	1.22 ± 0.05 [a]	66	3.61 ± 0.11[ab]	54	18.05 ± 0.63[a]
4	68	1.25 ± 0.05 [a]	60	3.92 ± 0.11[bc]	40	16.84 ± 1.12[a]
5	63	1.33 ± 0.06 [ab]	53	3.92 ± 0.12[bc]	44	20.57 ± 0.74[b]
6	64	1.41 ± 0,06 [b]	51	4.23 ± 0.17[c]	44	21.08 ± 1.00[b]
Staple structure		NS		NS		NS
Open	225	1.28 ± 0.03	155	3.66 ± 0.07	112	17.98 ± 0.52
Dense	264	1.34 ± 0.03	184	4.00 ± 0.09	130	19.49 ± 0.51
Year of shearing		NS		NS		NS
2002						
2003	152	1.39 ± 0.04 [a]	98	3.91 ± 0.10	90	17.66 ± 0.52
2004	174	1.26 ± 0.03 [b]	121	3.86 ± 0.09	51	19.37 ± 0.68
	163	1.28 ± 0.04 [b]	120	3.77 ± 0.11	101	19.50 ± 0.65
Type of birth		NS		NS		NS
Single	356	1.32 ± 0.03	265	3.83 ± 0.06	212	18.80 ± 0.40
Twins	26	1.23 ± 0.08	16	3.54 ± 0.34	13	19.98 ± 1.20

NS = not significant. * = significant at P<0,05 ** = significant at P<0.01.
Means within columns followed by the same superscript are not significantly different.

Correlation coefficients between some objective wool characteristics

Phenotypic correlation coefficients between some objective wool characteristics of Barki sheep are presented in Table (2). Staple length (SL) showed low positive values (r=0.17) of correlation with wool resilience (RES) and Fine fibres percentages (FF%; r=0,20) and low negative value with Staple crimp frequency (SC; r= -0,17) and medullation index (MI; r= -0.18). The correlation coefficients between Staple length and each of the above mentioned characteristics were significant (P<0.05) and highly significant (P<0.01) with SC. Furthermore, it could be observed that staple length had

very low negative and insignificant correlation with Fibre diameter. Azzam (1982) reported a negative and insignificant correlation coefficient between staple length and fibre diameter. These results disagreed with those reported by many authors. Guirgis (1973 b), working on Barki wool; Guerreiro *et. al.,* 1984, on different breeds of sheep; Garcia and Alvarez, 1992, on German Mutton Merino wool; Tekin, *et al,* 1998; Ahtash, 1998, on Libyan Barbary ewes; Abd El-Maguid, 2000, on Barki and Ossimi sheep, and Gadallah, 2001, on Barki wool reported positive and significant correlation coefficients between staple length and fibre diameter. Kroiter and Dyudina (1991) found that the correlation coefficient between wool length and fibre diameter was highly significant and ranged between r=0.74 and r=0.9. On the other hand, Helal (2000) found a negative and significant correlation coefficient between staple length and fibre diameter.

Staple crimp frequency (SC) showed low positive values (r=0.20) of correlation with wool resilience (RES) and low negative value with staple elongation (SE; r= -0,17). The correlation coefficients between staple crimp frequency and each of the above mentioned characteristics were highly significant (P< 0.01). Meanwhile, it could be observed that (SC) showed a medium negative value with Kemp fibres (KF%) and Medullation index (MI) but correlations were not significant. Gadallah (2001) reported a low negative correlation between staple crimp frequency and (KF%; r=-0.2) and medium negative correlation with (MI; (r=-0,3). The correlation coefficients between staple crimp frequency and each of KF% and MI were significant (P< 0.01). Bulkiness (BUL) showed a medium and positive (P<0.01) correlation coefficient with resilience (RES), and low positive correlation with fine fibres percentage and clean wool percentage, whereas values of correlation coefficient were low and negative (P<0.05) with KF% and MI. Significant and positive correlation coefficient of BUL with RES and FF%, and negative correlation coefficients of BUL with CF%, KF% and MI were reported by Gadallah (2001), on Barki wool, Abd El-Maguid (2000), on Barki and Ossimi sheep, and Helal (2000), on Siwa and El-Wady sheep.

Table (2): Correlation coefficients between some objective wool characteristics

Items	SC	SS	POBW	POBL	SE	BULK	RES
Staple Length (SL)	-0.17**	0.09	0.04	0.08	-0.04	0.08	0.17*
Staple Crimp (SC)		0.09	0.03	0.04	-0.17**	0.04	0.20**
Staple Strength (SS)			-0.003	0.06	-0.22	0.04	-0.11
Point of Break, weight(POBW)				0.64**	-0.08	-0.08	-0.03
Point of Break, length (POBL)					-0.19**	0.03	0.04
Staple Elongation (SE)						-0.02	0.08
Bulkiness (BUL)							0.53**

*** = significant at P<0.05   ** = significant at P<0.01.**

Table (2): Continued

Items	FD	FF%	CF%	HF%	KF%	MI	Yield
Staple Length (SL)	-0.01	0.20*	-0.12	-0.11	-0.10	-0.18*	0.01
Staple Crimp (SC)	-0.36	0.13	0.15	-0.07	-0.40	-0.32	0.02
Staple Strength (SS)	-0.06	-0.06	-0.07	0.11	0.15	0.13	-0.001
Point of Break, weight(POBW)	-0.002	-0.07	0.11	-0.07	-0.1	0.01	-0.04
Point of Break , length (POBL)	-0.06	0.01	0.03	-0.04	-0.05	-0.04	-0.02
Staple Elongation (SE)	0.01	-0.004	0.02	-0.01	-0.1	-0.01	-0.06
Bulkiness (BUL)	-0.16*	0.20*	-0.10	-0.002	-0.17*	-0.20*	0.22**
Resilience (RES)	-0,18*	0.22**	-0.03	-0.04	-0.30**	-0.30**	-0.04
Fibre diameter (FD)		-0.36**	0.02	0.19*	0.47**	0.49**	-0.03
Fine fibres (FF%)			-0.71**	-.26**	-0.48**	-0.83**	0.09
Coarse fibres (CF%)				-0.18*	-0.21**	0.20*	-0.14
Heterotype fibres (HF%)					0.23**	0.41**	0.05
Kemp fibres (KF%)						0.88**	0.04
Medullation index (MI)							-0.01

*** = significant at P<0.05** **** = significant at P<0.01.**

Resilience (RES) showed a low and positive (P<0.01) correlation coefficient with Fine fibres percentage (FF% ; r=0.22) , whereas values of correlation coefficient were medium and negative (P<0.01) with KF% (r= - 0.30) and MI (r= - 0.30) and low negative correlation (P<0.05) with Fibre diameter (FD; r= - 0.18). On the other hand , FD showed medium and positive (P<0.01) values of correlation coefficients with Kemp fibres percentage(KF%; r=0.47) and medullation index (MI; r=0.49) and low positive value (P<0.05) with Heterotype fibres (HF%; r=0.19), while it showed medium and negative correlation with FF% (r= -0.36). These results agreed with those reported by Gadallah (2001), in Barki wool. Ramadan (2005), in Barki ewes, found a negative and significant correlation coefficient (r=-0.76) between Fibre diameter and Fine fibres percentage. He found that correlation coefficient between Fibre diameter and Coarse fibres percentage was positive and highly significant (r=0.75). Tekin *et. al*., (1998) reported that FD was positive and significantly correlated with Kemp ratio. Significant and positive correlation coefficients of FD with medullated fibres percentage were reported by Ghoneim *et. al*., (1974b), Ahtash (1998), on Barbary sheep, Abd El-Maguid (2000), on Barki and Ossimi sheep, and Helal (2000), on Siwa and El-Wady sheep. Significant and negative correlation coefficients of FD with BUL and RES were also reported by Helal (2000). Furthermore , Fine fibres

percentage (FF%) showed high and negative (P<0.01) values of correlation coefficients with Coarse fibres percentage (CF%; r= - 0.71) and Medullation index (MI; r = - 0.83) and medium negative (P<0.01) values with HF% (r= - 0.26) and K% (r= - 0.48). These results agreed with those reported by Gadallah (2001), in Barki wool. Coarse fibres percentage (CF%) showed low (P< 0.05) and positive values of correlation coefficient with MI (r= 0.20) and low negative values with HF% (r= - 0,18 ; P< 0,05) and KF% (r= - 0,21;P< 0.01). Abd El-Maguid (2000), working on Barki and Ossimi sheep, found that CF% was negatively and significantly correlated with FF% and KF%. Similar findings were reported by Ahtash (1998), working on Libyan Barbary sheep and Gadallah (2001), in Barki sheep. Meanwhile , HF% showed medium and positive values of correlation coefficient with MI (r= 0.41) and low positive value with KF% (r= 0,23). In turn KF% showed high and positive values of correlation coefficient (r= 88; P< 0,01) with MI.

Generally, it could be seen that correlation coefficients showed high values between POBL with POBW; CF% with -FF%; MI with -FF% and KF% with MI. Correlation coefficient were of medium magnitude between RES with BUL ; SC with –FD; SC with – KF% and MI; RES with -KF% and -MI; FD with –FF%; FD with KF%, FD with MI; FF% with -HF% ; FF% with –KF%; HF% with MI. Other correlation coefficients were of low magnitude (Table 2).

It could be concluded that selection for low values of fibre diameter could result in an increase in FF%, BUL and RES and a decrease in KF% and MI. These results also indicated that selection for high values of bulkiness could result in an increase in FF%, RES and yield (r= 0.22) and a decrease in FD, KF% which might cause a decrease in wool production. Guirgis *et al* (1982), Soltan (1991) and Ahtash (1998) reported positive and significant correlations between greasy fleece weight and FD. Some authors reported positive and significant correlation between clean fleece weight and SL (Steinhagen and Wet, 1986; Soltan, 1991 and Ahtash, 1998). Gadallah (2001) showed that fibre diameter had a medium positive (P< 0.01) correlation coefficient with staple length.

Relationships between raw wool characteristics and yarn properties

Phenotypic correlation coefficients between some objective wool characteristics of Barki sheep and yarn properties are presented in Tables (3 and 4). Staple length showed low positive values of correlation with single yarn strength (r=0.16) and tenacity (r=0.17) and low negative value with abrasion (r= - 0.27) plied yarns (Table 4). Staple crimp frequency showed (Table 3) low negative values of correlation with number of thick places per kilometer of single yarns (r= - 0.24). However, Staple strength showed low positive values of correlation (r= 0.23) with irregularity of the mass (UM) and medium positive (r=0.39) value with thin places per kilometer of single yarns

(Table 3). In respect of plied yarns, staple strength showed low positive (r=0.28) values of correlation with yarns weight, low negative value with yarn count (r=-0.28) and low negative values with yarn strength and tenacity. Staple elongation showed medium negative (r = -0.38) values of correlation with mass irregularity (UM) and low negative value (r =-0.31) with (CVm) and number of thin places per kilometer (r = -0.032) of single yarns and low positive value (r = 0.19) with yarn twisting. Wool bulkiness (BUL) showed medium negative value (r = -0.41) of correlation with single yarn twisting, low negative values (r = -0,20) with single yarn tenacity and Coefficient of variation of mass (CVm ; r = -0.25) and low positive value (r = 0.18) with single yarn strength. In respect of plied yarns (Table 4) , wool bulkiness (BUL) showed low negative (r= - 0.28) values of correlation with yarns weight and low positive (r=0.26) value with yarn count. This might mean that higher bulk wool could produce lighter carpet weight in unit area. Furthermore, wool resilience showed low positive value (r = 0.17) of correlation with single yarn weight. low negative values with single yarn count (r = -0.19) and twisting (r = -0.14) and low negative value with number of thin places per kilometer of single yarns (r = -0.34). In respect of plied yarns (Table 4), wool resilience showed low negative (r=-0.25) values of correlation with yarns weight, low positive (r=0.23) value with yarn count. This might mean that higher resilience wool could produce lighter carpet weight in unit area. Meanwhile, Fine fibres percentages correlated negatively (Table 3) with yarn abrasion (r= - 0.18 ; P< 0.05). Heterotype fibres percentage showed positive value with single yarn count (r= 0.25; P< 0.01) and negative one with yarn weight (r= - 0.26 ; P< 0.01) and single yarn elongation (r= - 0.16 ; P< 0.05) . On the other hand Kemp fibre percentage correlated significantly positive (Table 3) with single yarn abrasion (r= 0.16 ; P< 0.05) , single yarn CVm% (r= 0.32 ; P< 0.01) and thin places per kilometer of single yarn (r= 0.36 ; P< 0.01) and significantly negative with single yarn strength (r= - 0.19 ; P< 0.05) and single yarn elongation (r= - 0.20 ; P< 0.05). Medulation index showed low positive value (P< 0.05) with single yarn count (r= 0.19), single yarn abrasion (r= 0.20) and thin places per kilometer of single yarn (r= 0.25) and low negative value with single yarn weight (r= - 0.19). On the other hand , yield % correlated negatively with single yarn strength (r= - 0.14) m single yarn tenacity (r= - 0.16) and single yarn twisting (r= 0.17). On the Other hand , plied yarn weight showed positive value of correlation with Staple Strength (r= 0.28 ; P< 0.01) , Heterotype fibres (r= 0.30 ; P< 0.05) and Medullation index (r=0.20 ; P< 0.05) and showed in turn negative value with Bulkiness (r= - 0.28 ; P< 0.01) and Resilience (r= - 0.25 ; P< 0.01). Plied yarn count showed positive value of correlation with Bulkiness (r= 0.26 ; P< 0.01) , Resilience (r= 0.23 ; P< 0.05) and showed in turn negative values with Staple Strength (r= - 0.28 ; P< 0.01) . Heterotype fibres (r= - 0.29; P< 0.01) and Medullation index (r= - 0.19 ; P< 0.05).

Table (3): Correlations between raw wool characteristics and single yarn properties

Items	Yarn weight	Yarn count	Yarn strength	Yarn elongation	Yarn tenacity
Staple Length (SL)	0.03	0.04	0.16**	0.01	0.17**
Staple Crimp (SC)	0.02	-0.04	0.07	0.10	0.07
Staple Strength (SS)	-0.09	0.09	-0.08	-0.10	-0.07
Point of Break , weight(POBW)	-0.06	0.07	0.04	0.02	0.04
Point of Break , length (POBL)	-0.03	0.04	-0.07	0.02	-0.08
Staple Elongation (SE)	0.06	-0.06	0.1	-0.002	0.11
Bulkiness (BUL)	0.11	0.11	0.18*	-0.11	-0.20**
Resilience (RES)	0.17*	-0.19*	0.08	-0.05	0.09
Fibre diameter (FD)	-0.19*	0.21*	-0.01	-0.05	-0.01
Fine fibres (FF%)	0.16	-0.14	0.01	-0.01	0.01
Coarse fibres (CF%)	-0.01	-0.01	0.17*	0.20*	0.17*
Heterotype fibres (HF%)	-0.26**	0.25**	-0.15	-0.16*	-0.15
Kemp fibres (KF%)	-0.13	0.14	-0.19*	-0.2*	-0.19*
Medullation index (MI)	-0.19*	0.19*	-0.14	-0.14	-0.14
Yield	-0.01	-0.02	-0.14*	-0.03	-0.16*

*** = significant at P<0.05** **** = significant at P<0.01.**

Table (3): Continued

Items	Yarn twisting	Yarn abrasion	Um	CVm %	Thin places	Thick places
Staple Length (SL)	-0.07	-0.08	0.21	0.26	0.23	0.15
Staple Crimp (SC)	-0.08	-0.1	-0.07	-0.15	-0.23	-0.24*
Staple Strength (SS)	-0.09	-0.01	0.23*	0.18	0.39 **	-0.09
Point of Break , weight(POBW)	0.05	-0.01	0.08	0.01	-0.06	-0.06
Point of Break, length(POBL)	-0.09	0.08	0.02	-0.01	-0.1	-0.02
Staple Elongation (SE)	0.19**	0.014	-0.38**	-0.31*	-0.32**	0.07
Bulkiness (BUL)	-0.41**	-0.03	-0.21	-0.25*	-0.215	0.02
Resilience (RES)	-0.14*	-0.07	-0.20	-0.15	-0.34**	0.11
Fibre diameter (FD)	0.02	0.25**	0.17	0.3*	0.23	-0.09
Fine fibres (FF%)	0.05	-0.18*	0.05	-0.07	-0.03	0.08
Coarse fibres (CF%)	-0.09	0.06	-0.17	-0.16	-0.27*	-0.27*
Heterotype fibres (HF%)	-0.07	0.1	-0.21	-0.05	0.04	-0.20
Kemp fibres (KF%)	0.09	0.18*	0.23	0.32**	0.36**	0.02
Medullation index (MI)	0.02	0.20*	0.09	0.23	0.25*	-0.15
Yield	-0.17**	-0.01	0.04	0.004	0.13	0.05

*** = significant at P<0.05** **** = significant at P<0.01.**
Um: Irregularity of the mass **CVm%: Coefficient of variation of mass**

Whereas, plied yarn strength correlated negatively with Staple Strength (r= - 0.18 ; P< 0.01) and Yield % (r= - 0.17 ; P< 0.01). Plied yarn tenacity in turn showed low negative value of correlation with Staple Strength (r= 0.15 ; P< 0.05) and Yield % (r= 0.13 ; P< 0.05). Otherwise , plied yarn twisting correlated negatively significantly with yield % (r= - 0.18 ; P< 0.05). On the other hand plied yarn abrasion showed negative value of correlation with Staple Length (r= - 0.27 ; P< 0.01). Other correlation coefficients were of low magnitude and /or not significant (Tables 3 and 4).

Table (4): Correlations between raw wool characteristics and plied yarns properties

Items	Yarn weight	Yarn Count	Yarn Strength	Yarn elongation
Staple Length (SL)	-0.15	0.14	-0.01	-0.06
Staple Crimp (SC)	-0.12	0.11	-0.05	0.05
Staple Strength (SS)	0.28**	-0.28**	-0.18**	0.02
Point of Break , weight (POBW)	0.01	-0.01	0.03	-0.05
Point of Break , length (POBL)	0.00	0.01	-0.01	0.02
Staple Elongation (SE)	-0.01	0.01	0.08	0.06
Bulkiness (BUL)	-0.28**	0.26**	-0.08	0.03
Resilience (RES)	-0.25**	0.23*	0.08	0.04
Fibre diameter (FD)	0.03	-0.01	-0.05	-0.03
Fine fibres (FF%)	-0.17	0.15	-0.09	-0.07
Coarse fibres (CF%)	0.003	0.01	0.04	0.13
Heterotype fibres (HF%)	0.30**	-0.29**	-0.03	-0.02
Kemp fibres (KF%)	0.15	-0.13	0.1	-0.06
Medullation index (MI)	0.21*	-0.19*	0.1	-0.01
Yield	0.09	-0.08	-0.17**	-0.01

*** = significant at P<0.05 ** = significant at P<0.01.**

Table (4): Continued

Items	Yarn tenacity	Yarn twisting	Yarn abrasion
Staple Length (SL)	-0.06	-0.04	-0.27**
Staple Crimp (SC)	0.11	-0.14	-0.07
Staple Strength (SS)	-0.15*	-0.01	0.06
Point of Break , weight (POBW)	-0.01	0.03	0.05
Point of Break , length (POBL)	-0.07	0.05	0.12
Staple Elongation (SE)	0.10	-0.09	0.11
Bulkiness (BUL)	-0.04	0.07	-0.09
Resilience (RES)	0.08	-0.09	-0.09
Fibre diameter (FD)	-0.09	-0.09	0.02
Fine fibres (FF%)	0.003	-0.09	0.15
Coarse fibres (CF%)	0.06	-0.07	0.09
Heterotype fibres (HF%)	-0.13	-0.01	0.15
Kemp fibres (KF%)	-0.04	-0.05	0.06
Medullation index (MI)	-0.04	-0.08	0.13
Yield	-0.13*	0.18*	-0.06

*** = significant at P<0.05 ** = significant at P<0.01.**

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تحديد العلاقات بين الآداء الإنتاجى والتناسلى وبعض صفات الصوف فى أغنام البرقى

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الملخص العربى

استخدم فى هذه الدراسة عدد ٤٨٩ حيوان من أغنام البرقى بمحطة بحوث مريوط التابعة لمركز الصحراء حيث استمرت الدراسة مدة ثلاث سنوات وكان الهدف منها هو تحديد العلاقات بين الآداء الإنتاجى والتناسلى وبعض صفات الصوف فى أغنام البرقى وكانت ظروف الرعاية مماثلة لتلك المتبعة فى القطعان التجارية لهذه المنطقة.

كان متوسط عدد التلقيحات اللازمة للإخصاب ١.٣١ وقد كانت أصواف النعاج ذات درجة الكمب المنخفضة هى الأقل معنويا فى عدد التلقيحات (١.٢٤±٠.٠٠٤) مقارنة بتلك التى درجة الكمب بها متوسطة (١.٣٢ ±٠.٠٠٣) أو الكثيفة فى درجة الكمب (١.٣٨±٠.٠٠٥)، وبوجه عام أظهرت معاملات الإرتباط قيما مرتفعة بين كل من بعد نقطة القطع عن قمة الخصلة على اساس الطول و بعد نقطة القطع عن قمة الخصلة على اساس الوزن ، نسبة اللألياف الخشنة مع نسبة الألياف الناعمة، دليل النخاع مع نسبة الألياف الناعمة ونسبة ألياف الكمب مع دليل النخاع .

سجلت معاملات ارتباط متوسطة بين المقدرة على استعادة الشكل أو الحجم بعد تأثير الضغط والمقدرة على مقاومة الضغط ، تعرجات الخصلة مع قطر الليفة، تعرجات الخصلة مع الياف الكمب، دليل النخاع والمقاومة للشد مع الياف الكمب، دليل النخاع وقطر اللألياف مع الألياف الناعمة، قطر الليفة مع الياف الكمب، قطر الألياف مع دليل النخاع، الألياف الناعمة مع الألياف المختلفة ، اللألياف الناعمة مع الياف الكمب والألياف غير المتجانسة مع دليل النخاع. سجلت أيضا بعض قيم الإرتباطات المنخفضة .

امكن استنتاج أن الإنتخاب لقيم منخفضة من قطر الليفة ينتج عنه زيادة فى نسبة الصوف الناعم وقوة الضغط ومقاومة الشد ونقص فى نسبة الياف الكمب ودليل النخاع.

أظهرت النتائج أيضا أن الإنتخاب للقيم العالية من قوه الضغط يمكن أن تؤدى لزيادة فى نسبة الألياف الناعمة ومقاومة الشد والمحصول ونقص فى قطر الألياف ونسبة الياف الكمب والذى ربما يسبب نقص فى انتاجية الصوف.

درست أيضا معاملات الإرتباط المظهرى بين بعض صفات الصوف المدروسة وصفات الغزول.