

SOME WOOL CHARACTERISTICS OF AWASSI EWES

By

K. E. GHONEIM and G. E. M. ASHMAWY

*Animal Production Dept., Faculty of Agriculture, Ain Shams Univ.
Ministry of Land Reform, Dokki, Cairo.*

Summary

The Egyptian Agriculture Organisation imported 54 Awassi sheep from Syria in 1960. The wool characteristics of the ewes born in Egypt were studied in the present work. A total of 405 wool samples were taken from shoulder and hip regions at different ages. The traits dealt with were fibre diameter, fibre length, medullation and crimps.

The results showed that the Awassi sheep belongs to the long wool type where the total fibre length ranged between 70.1 and 101.3 mm. for a period of six months growth. The carpet wool produced has an average fibre diameter ranging from 32.29 to 38.15 microns and contains about 54.8 percent medullated fibres. The average number of crimps per two centimeters ranged between 4.6 and 5.1 for all ages studied. The effect of age, fibre types and body region on the different wool traits were studied.

Introduction

The purpose of the present work was to study some physical characteristics of the wool of Awassi sheep in U.A.R. before undertaking to import large numbers of this breed of sheep from Syria. Also, the physical properties of Awassi wool were compared with those of the local breeds of sheep in U.A.R.

Materials and Methods

Awassi sheep were shorn twice a year, *i.e.* in April and October by experienced hand-shearers. Wool samples were taken only from the ewes born in Egypt at 9, 15, 21, 27 and 33 months of age. Prior to shearing, two wool samples were clipped from the right side of each individual. The first sample was taken from the shoulder and the second from the hip region. These two samples were used to determine the shoulder's and hip's fibre diameter, medullation, fibre length and number of crimps per two centimeters. The sub-samples were divided into three fibre types, *i.e.*, outercoat, innercoat and kempt fibres using the method suggested by Dony and Smith (1961).

For measuring fibre length, fifty fibres from each of the three fibre types were chosen at random and measured by the fibre length measuring apparatus "Metrimpex, Budapest". The fibre diameters were measured according to "A.S.T.M." width method by choosing fifty fibres from each of the three fibre types randomly. Medullation percentage was estimated by counting the number of medullated fibres occurring while recording the diameter.

The number of crimps were obtained from outercoat and innercoat fibres only. Ten fibres from each group were chosen at random and used to determine the average number of crimps per two centimeters using the method suggested by Hunt *et al.* (1952). Methods given by Cochran and Cox (1960) were applied for statistical analysis.

Results and Discussion

Fibre Diameter : The results given in Table 1 and Figures 1 and 2 indicate that kemp fibres were the largest in thickness among all types of fibres (51.4 - 75.8 m.), followed by outercoat fibres (46.5 - 54.5 m.). The innercoat fibres were the finest in this respect (23.9 - 29.8 m.). These results are in agreement with the findings of Mahal *et al.* (1953) and Doney and Smith (1961). Fibre types proved to have highly significant effect upon fibre diameter.

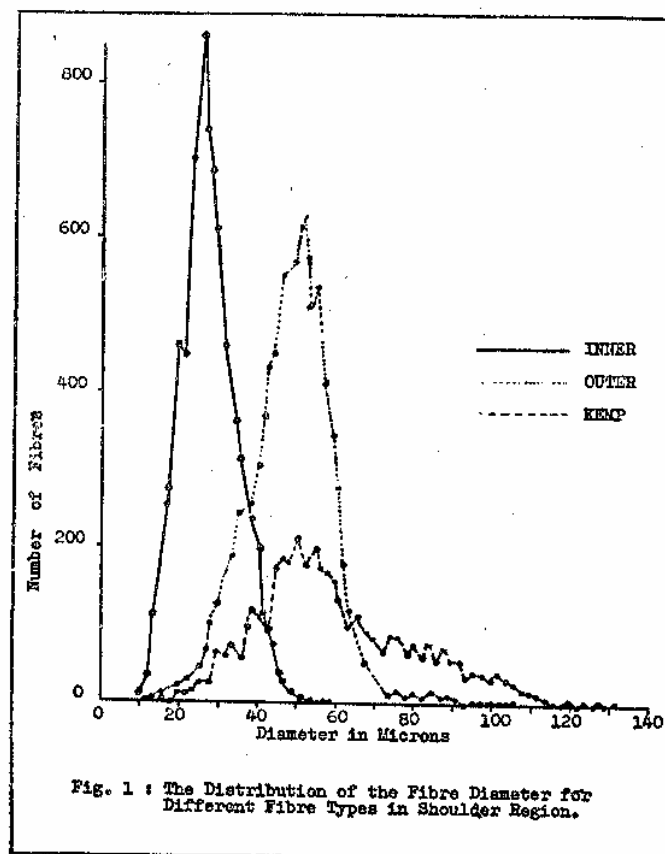
The total average fibre diameter in Awassi wool ranged from 32.29 to 38.15 microns for all ages studied (Table I). Comparing the present results with those reported by Pohle (1942), Bertone and Landblom (1949), Ralcsev (1951) and Ferreira (1958) it could be concluded that the fleeces of Awassi sheep are of carpet wool type.

Comparing the results in Table I for the fibre diameter of Awassi ewes with those stated by Badreldin *et al.* (1952), Ragab *et al.* (1956) and Ragab and Ghoneim (1961) on Ossimi, Rahmani and Barki sheep, it could be observed that the wool produced by Awassi ewes has nearly the same average fibre diameter as that obtained from the indigenous breeds of sheep.

The increase in average fibre diameter with advance in age is in accordance with the findings of Narayan (1951), Karam and Ragab (1959) and Sliwa *et al.* (1962) using different breeds of sheep. Age had a highly significant effect upon fibre diameter of Awassi wool.

The wool grown on the hip region was coarser than that grown on shoulder region at all ages studied. (Fig. 1 and 2). The differences were significant.

Medulated Fibres Percentage : The percentage of medullated fibres were higher in kemp fibres (88.0 - 95.5%) than in the outercoat fibres



(61.8 - 71.0%) while the innercoat fibres had the least values in this respect (Table I). These results are supported by the findings of Palian (1955) and Doney and Smith (1961) who showed that the number of medullated fibres increases with increasing fibre diameter.

However, the present study showed that Awassi fleeces contain as much as 54.8 percent medullated fibres. Comparing this ratio with those reported by Narayan (1951) on Pattanwadi sheep (from 0.0 to 30%) and Belic and Petrovic (1957) using Sjenica wool (2.4 - 13.2%) and Ragab and Ghoneim (1961) on Barki sheep (14.0%), it could be concluded that Awassi fleeces are highly medullated.

Nevertheless, in any breeding program for Awassi sheep, medullation percentage should be paid great attention as it makes up an obvious defect in the fleeces of Awassi sheep. On the other hand, selection can be carried out successfully as a very wide variability in the amount of medullation

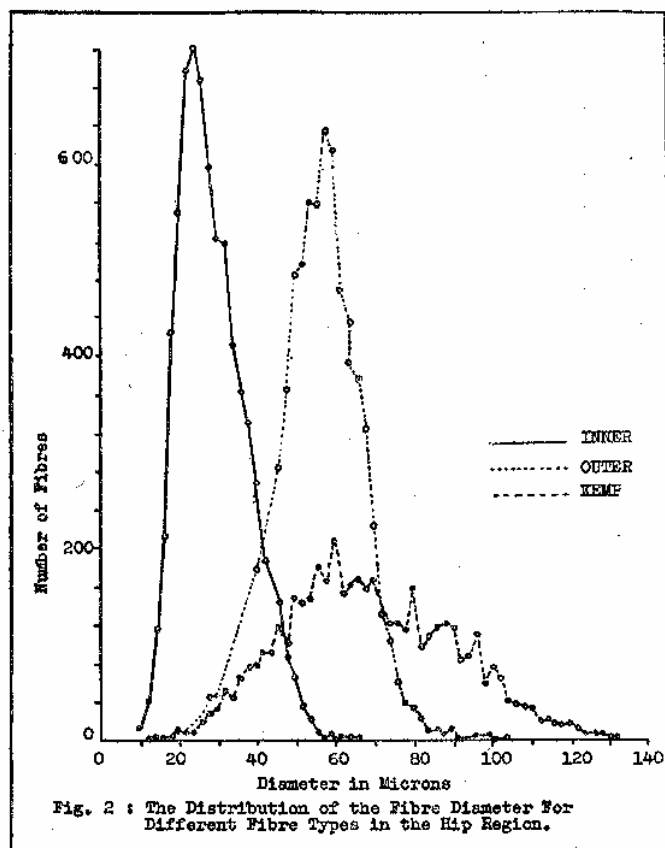


Fig. 2 : The Distribution of the Fibre Diameter For Different Fibre Types in the Hip Region.

was noticed in the innercoat and outercoat fibres. It appears that there is a relationship between the number of medullated fibres and fibre diameter. The medullation percentage increased from innercoat to outercoat to kemp fibres. As it was noticed that kemp fibres are almost medullated, eliminating kemp fibres from Awassi fleeces should cause a remarkable reduction in medullation percentage.

Although age proved to have no significant effect on medullation percentage, yet the decrease in the percentage of medullated fibres from 57.2% at 9 months old to 52.7% at 33 months of age in Awassi fleeces is in agreement with the findings of Belic (1954) and Nawara (1961).

Hip region had higher percentage of medullated fibres than shoulder ones for all ages studied and the differences were significant. This result is supported by the findings of Narayan (1951), Belic (1954) and Sonmez

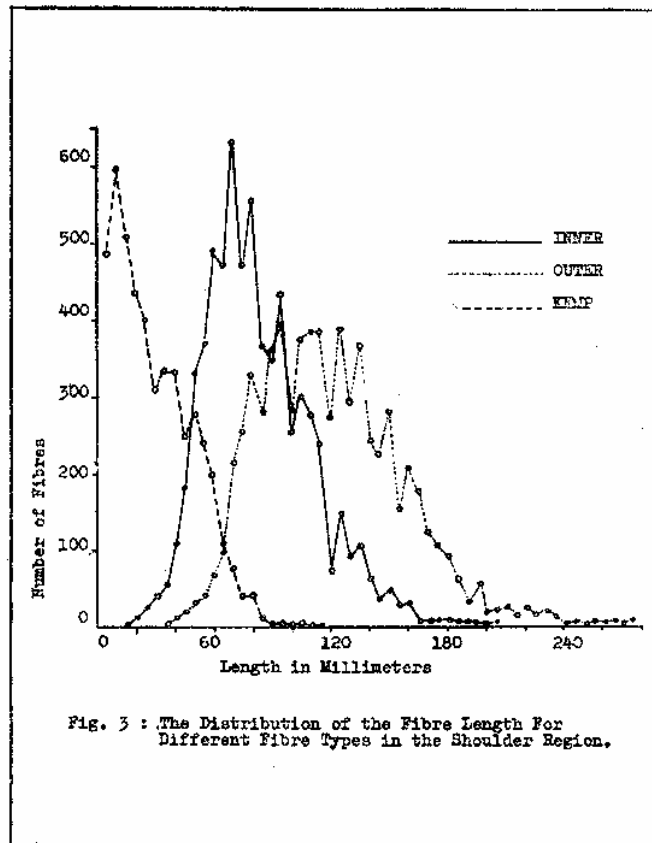


Fig. 3 : The Distribution of the Fibre Length For Different Fibre Types in the Shoulder Region.

(1962) who agreed that the rear parts of the fleece had a higher percentage of medullated fibres than the front parts.

Fibre Length : The results given in Table 1 and Figures 3 and 4 show the total average of fibre length ranged between 70.12 and 101.34 mm. for all ages studied and for 6 months growth. Therefore, it is expected that the average fibre length in Awassi wool may range from 140 to 202 mm. for a period of twelve months growth.

Kammlade (1947) stated that staple length was 75, 100 and 175 mm. for Merino, Oxford and Romney sheep respectively. The average fibre length in coarse and carpet-wooled sheep was reported by many workers. Nikolic (1952), Saraza (1953) and Lalatovic (1958) showed that average fibre length ranged from 116.6 to 240.0 mm. for different breeds of sheep. Hence, it could be concluded that Awassi breed is of the long wool type of sheep.

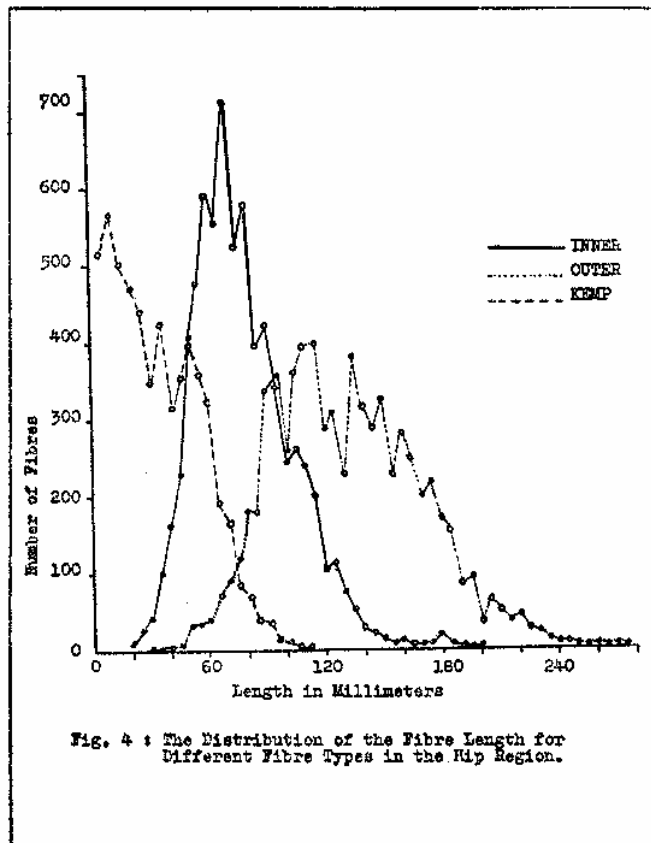


Fig. 4 : The Distribution of the Fibre Length for Different Fibre Types in the Hip Region.

The fibre length of both outercoat and innercoat as well as the total average (Table 1) increased from 9 to 15 months of age and from 21 to 27 months old, while it decreased from 15 to 21 and from 27 to 33 months of age. It seems that the time of shearing or in other words the season during which wool is grown has a great influence upon fibre length. The wool samples taken at 9, 21 and 33 months of age were generally shorn in October of 1961, 1962 and 1963 respectively (summer growth), while those taken at 15 and 27 months old were shorn in April 1962 and April 1963 respectively (winter growth). It was observed that wool grown in summer was, in general, shorter than that grown in winter. This is in agreement with the results of Badreldin *et al.* (1952) and Vecchiotti (1960).

Age, body region and fibre types proved to have highly significant effect upon fibre length of Awassi wool. Hip region produced longer wool

TABLE I
Average fibre diameter, medullation, fibre length and crimps for Awasi wool
at different ages

Group	No. of samples	Fibre diameter (micron)	Medullation %	Fibre length (mm.)	No. crimps of per 2 cms.
At 9 months old					
Outercoat	56	46.53	70.5	118.7	2.86
Innercoat	56	23.87	11.6	79.5	6.29
Kemp	56	51.40	88.0	22.8	—
Average*		32.29	57.21	84.08	4.73
At 15 months old					
Outercoat	60	51.79	71.0	139.2	2.08
Innercoat	60	28.48	11.8	92.1	6.18
Kemp	60	61.59	88.5	28.1	—
Average*		35.28	57.03	101.34	4.96
At 21 months old					
Outercoat	64	54.26	65.0	114.5	1.93
Innercoat	64	29.85	12.7	71.7	5.69
Kemp	64	72.00	94.9	33.5	—
Average*		37.06	53.78	80.38	4.61
At 27 months old					
Outercoat	38	50.47	63.9	137.3	2.02
Innercoat	38	26.81	14.1	81.6	6.67
Kemp	38	65.64	94.1	26.6	—
Average*		35.53	53.30	90.10	5.03
At 33 months old					
Outercoat	42	54.51	61.8	101.4	1.68
Innercoat	42	29.78	12.3	63.2	5.67
Kemp	42	75.80	95.5	34.9	—
Average*		38.15	52.75	70.12	4.63

* The averages were computed on the basis of fibre type ratio by count.

than shoulder region and this is in accordance with those reported by Badreldin *et al.* (1952) and Doney (1959) who stated that the shoulder region has shorter wool fibres than the hip or the thigh in different breeds of sheep.

Crimps : The total average number of crimps per two centimeters ranged between 4.61 and 5.03 for Awassi wool fibres at all ages studies (Table 1). The innercoat fibres had more crimps than the outercoat fibres and the differences were significant (Figs. 5 and 6).

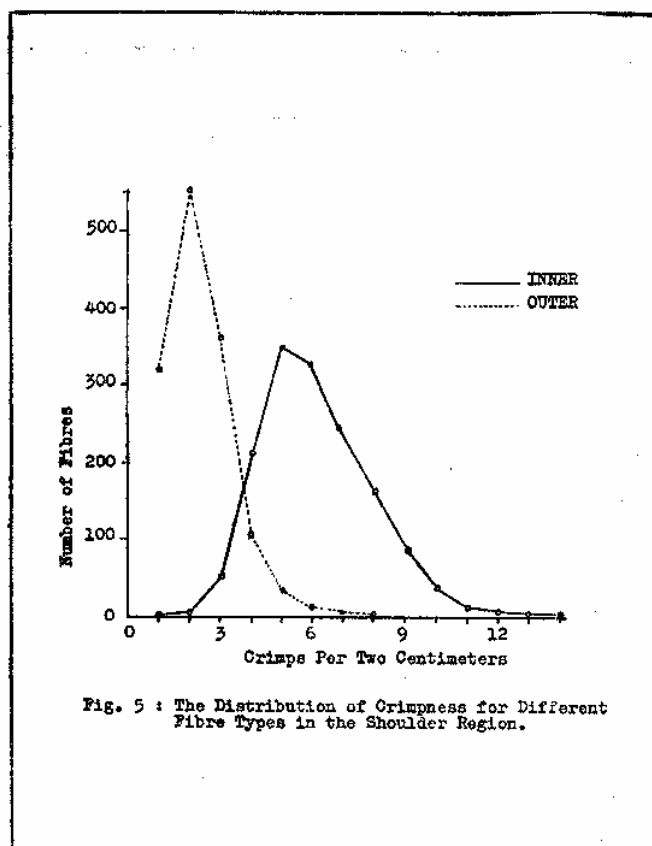


Fig. 5 : The Distribution of Crimpness for Different Fibre Types in the Shoulder Region.

It seems that Awassi wool fibres are more elastic and attractive than those of the native sheep, as they are more crimp. Ragab and Ghoneim (1961) stated that the average number of crimps per two centimeters ranged from 2.56 to 2.81 for Barki wool.

The decrease in number of crimps of Awassi wool with advance in age agrees with the findings of Narayan (1951) and Ragab and Ghoneim (1963), but it disagrees with the results stated by Sharafeldin and Ghoneim (1963), on Merino sheep. However, age proved to have a highly significant effect upon number of crimps of Awassi fleeces.

As far as the effect of body region on the incidence of crimpness is concerned, it was found that the wool grown on the shoulder region was more crimp than that grown on the hip region. The differences were significant.

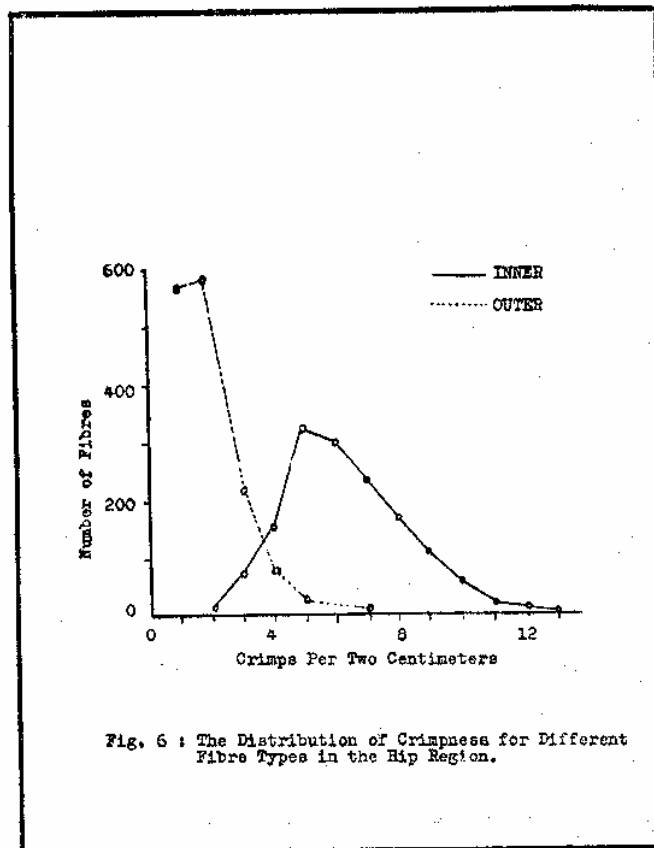


Fig. 6 : The Distribution of Crimpness for Different Fibre Types in the Hip Region.

It was noticed that Awassi sheep had no trouble in adapting themselves to conditions in Egypt. The breed was noticed for its relatively high milk and lambing production. The results stated by Ghoneim *et al.* (1957) on some physical properties of Awassi fleeces indicate that the breed gives more wool yield than the indigenous sheep, which is a matter of great economic importance nowadays in U.A.R. Meanwhile, the other wool characteristics — except that of medullation — proved to be on par with — if nobetter than — those of the local sheep.

On the fore-mentioned considerations, it is recommended that greater numbers of Awassi sheep should be imported. It is also thought that crossing Awassi sheep with the native breeds may have encouraging results.

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بعض الخصائص العامة لصوف أغنام العوامس

الملخص

امتوردت الجمعية الزراعية المصرية ٥٤ رأسا من أغنام العوامس السورية في عام ١٩٦٠ . ولقد درست بعض الصفات العامة لصوف النعاج التي ولدت بمصر حيث استخدم في هذا البحث ٤٠٥ عينة من صوف الكتف وأعلى الفخذ .

أوضحت هذه الدراسة ان صوف اغنام العوامس السورية ينتمى الى رتبة الصوف الطويل ، حيث تراوح طول الليفة في ستة شهور من النمو بين ٧.١ - ١٠.١ سم وتراوح سمك الليفة بين ٣٢.٢٩ - ٣٨.٥١ ميكرون في الاعمار المختلفة . كما بلغت نسبة الالياف ذات النخاع نحو ٥٤.٨٪ وتراوح عدد التموجات في كل ٢ سم طولى بين ٤٦ - ٥١ ، كما درس تأثير العمر ونوع الالياف ومنطقة الجسم على صفات الصوف السابقة .