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Some wool characteristics of German originated Angora rabbits breeding in Turkey

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Angora rabbits mainly bred for wool and its origin are unknown. According to Nachtsheim it was taken from black sea coast countries to France and England by English navigators and was improved in these countries (Akin 1988).

It is a natural hollow chambered fibre that provides the best natural insulation while allowing body moisture to escape, keeping the weather dry, as well as warm. Angora rabbit wool directly could be used in felt hat industry (Emsen 1996). Angora hair is about 7 times warmer than sheep's wool and is usually blended with other fibres for a fabric that allows the skin to breathe without becoming clammy. Angora rabbits' wools are used in textile industry for producing several garments such as mittens, socks, caps, scarves, sweaters, kid clothes, Angora woman blouse, jacket, sport garments and coat because it is easy to dye, blends extremely well with other fibres.

Now-a-days, despite the fact that the most important country of producing Angora rabbit wool is China, it is also produced at important amounts in South America, Korea, Japan and European countries (Hopkins 1992). Angora rabbit wool for textile industry in Turkey has been largely imported from China and German. Although Angora rabbit has not been bred in universities and the other search centers since long years in Turkey, it has been begun interested in breeding of this species more at academic degree. So that it is rarely interested in Angora rabbit breeding in Turkey, the numbers of research in this field are as little as absent. By considering the developments at this field in the next years by determining some physical properties of wools of German Angora rabbit which bred in private firm in the province of Kirsehir, it has been aimed that in respect of textile industry to determine these wools suitability.

The materials of this research consisted of wool samples obtained from two age and female Angora rabbits raising in private firm in the Kirsehir Province in Turkey.

A totally of 40 Angora rabbits were selected for this research. Wool samples were taken from rib section of each rabbit. It was examined physical characteristics such as single nature fibre length, single true fibre length, fibre diameter, ratio of kempy fibre, breaking strength and elasticity of wool samples. While Lanameter apparatus was used for fibre diameter analyze, Schopper apparatus was used for breaking strength and elasticity. Single nature and true fibre lengths were determined according to method indicated by Doehner and Reumuth (1964). The SPSS Statistic Program was used to obtaining statistical values from wool characteristics.

In the research, phenotypic parameters of physical properties of Angora rabbit wool samples that were important for textile industry were presented in Table 1.

Table 1. Some values of some physical properties of Angora rabbit wool samples

Physical properties	N	Minimum	Maximum	$\bar{x} \pm S_{\bar{x}}$	V (%)
Single natural fibre length (cm)	40	3.31	9.75	6.49±0.220	21.46
Single true fibre length (cm)	40	7.32	10.74	8.99±0.151	10.62
Fiber diameter (Micron)	40	14.84	18.15	16.64±0.164	6.22
Kempy fibre ratio (%)	40	0.39	3.80	2.23±0.154	43.72
Single fibre breaking strength (g) (absolute)	40	7.05	18.54	12.27±0.539	27.78
Elasticity (%) (elongation)	40	48.68	66.92	56.88±0.672	7.48

Single nature fibre length is the length that fibres contain crimps and do not to expose any of stretching or extension treatments (Harmancioglu 1974). In this research, single nature fibre length of German Angora rabbit was found as

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6.49±0.220 cm. This trait was found as 5.13 cm in Tanghang Angora rabbits originated German (Zhou and Zhang 1988), were found 5.25 cm, 7.17 cm and 6.27cm in France, German and France × German Angora rabbits, respectively, (Fleischhauer *et al.* 1989) and 6.75±0.17 cm, 5.06±0.27 cm and 5.66±0.19 cm in German Russian and German × Russian Angora rabbits respectively (Srinivasan *et al.* 1995). The result with single nature fibre length in this research especially showed similarity to the results that were determined in France × German Angora rabbits (Fleischhauer *et al.* 1989) and German rabbits (Srinivasan *et al.* 1995). The advantage of the length of the Angora rabbits' fibres is that it is easier to spin.

Single true fibre length is obtained by straightening of crimpy of fibre. Fibres that have higher values difference between nature and true length are more value than others (Hermann *et al.* 1996). In this research, single true fibre length was found as 8.99±0.151 cm. However, it was not possible to discuss this value because didn't find any researching result concerning this trait in Angora rabbits.

Fibre diameter is the most important trait of Angora rabbit wool, and it plays a big role on the quantity determination. In this research, fibre diameter was found as 16.64±0.164 m. Different values for fibre diameter were obtained in the some research on different origin of Angora rabbits. Therefore Gürtanin (1979) found that in German male and female rabbits fibre diameter were 17.08 μ and 16.19 μ respectively. Fleischnaues *et al.* (1989) found fibres diameter as 15.5 μ, 14.9 μ, and 15.9 μ in France, German and France × German rabbits respectively. Therefore this trait was found as 17.08 μ and 16.19 μ in German male and female rabbits, respectively, (Gürtanin 1979), 15.5 μ, 14.9 μ and 15.9 μ in the France, German and France × German rabbits, respectively, (Fleischhauer *et al.* 1989), 12.8 μ and 19.8 μ in German and France Angora rabbits, respectively (Hermann 1996), and 14.9 μ in German Tanghang Angora rabbits (Zhou and Zhang 1988). The value with fibre diameter in this research has already been in convenience with values obtained from German female rabbits by Gürtanin (1979). The advantage of the fineness of Angora rabbits' wool is that it is likely to matt or felt and it is ideal for baby garments, winter underwear, sweaters, hats, scarves, and mittens.

In this research, kempy fibre ratio was determined as 2.23±0.154 %. This value was lower than 3.0% and 8.5%, respectively, values obtained from German and France × German Angora rabbits by Fleischnaues *et.al* (1989) and 3.98±0.27%, 6.10±0.418% and 4.12±0.290%, respectively, values obtained from German, Russian and German × Russian Angora rabbits by Srinivasan *et al.* (1995). Many people find sheep's wool too irritable and scratchy because of the kempy fibre ratio. But many people find Angora wool a beautiful alternative for warmth, comfort and luxurious.

In this research, single fibre breaking strength of Angora rabbits fibres was determined as 12.27±0.539. This result was fairly higher than 8.32 g and 8.69 g values obtained from, respectively, male and female Angora rabbit wools by Gürtanin (1979). One advantage of this is that it is very durable and hand-washable. Also elasticity of Angora rabbits fibres was found as 56.88±0.672 %. This result was fairly higher than 35.12%, 38.20%, 41.39%, 39.38% values determined in 9, 10, 11 and 12'th month after shearing by Finzi *et al.* (1989).

As a result of this research, the determined values of fibre length, diameter, elasticity and breaking strength in German Angora rabbit's wool were found as sufficient level in respect of textile knitting or tricot industry. According to determined values it can be spun very fine and with a high twist. Also it could be say that Angora rabbits were bred not important changes in their wool characteristics in this firm in the Kirsehir Province of Turkey. That's why, the generalization of very few level Angora rabbit breeding in this region is very important for supplying of need Angora rabbits wool in Turkey textile industry.

SUMMARY

Angora rabbit wool for textile industry in Turkey has been largely imported from China and German. Although Angora rabbit has not been bred in universities and the other search centers since long years in Turkey, it has been begun interested in breeding of this species more at academic degree. The materials of this research consisted of wool samples obtained from 2 age and female Angora rabbits raising in private firm in the Kirsehir Province in Turkey. In this research, some physical characteristics such as single nature and true fibre lengths, fibre diameter, kempy fibre ratio, single fibre breaking strength and elasticity were studied on wool from German originated rabbits. These characteristics were found as 6.49±0.220 cm, 8.99±0.151 cm, 16.64±0.164 μ, 2.23±0.154%, 12.27±0.539 cm, and 56.88±0.672% respectively. These results showed similarity to the results that were determined in the other researches. These values shows that Angora rabbit wools suitable for textile knitting industry and Angora rabbit breeding is very important for supplying of need Angora rabbits wool in Turkey textile Industry.

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