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STUDIES ON THE QUALITY OF REX RABBIT FUR

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SUMMARY : The skin of Rex rabbit is usually used as fur, which has characteristics of softness, smoothness and beauty. The results of our study show that the skin area of a five months old Rex rabbit is 950–1000 cm². The hair density on the skin is 15000 to 38000 fibres/cm². The diameter of hair fibre is 18–19 μm. The proportion of coarse hair is 6–7 %, and the proportion of fine hair is 93–94 %. The length of hair fibre is 1.3–2.2 cm. The thickness of the skin is 1.8–2.1 mm.

RESUME : Etude de la qualité de la fourrure du lapin Rex. *La peau du lapin Rex est généralement utilisé comme fourrure pour ses qualités de douceur, de moelleux et de beauté. Les résultats de notre étude montrent que la surface de peau d'un lapin Rex agé de 5 mois est de 950–1000 cm². La densité du poil sur la peau est de 15000 à 38000 fibres/cm². Le diamètre du poil est de 18-19 μm. Le poil grossier représente 6-7 % et le poil fin 93-94 % de la fourrure. L'épaisseur de la peau est de 1.8-2.1 mm.*

INTRODUCTION

Rex rabbit is a typical fur producing rabbit (YING *et al.*, 1993). Its fur has characteristics of shortness, fineness, density, smoothness and beauty. The aim of our research is to find the essence of quality of Rex rabbit fur through the studies on its characteristics.

MATERIALS AND METHODS

Three males and three females five month old white Rex rabbits were randomly sampled from a rabbit farm in the suburb of Hangzhou city. Three males and three females New Zealand White rabbits of the same age were used as samples for control. All the rabbits were raised in cages in the same farm.

1 - Sampling method

According to the conventional procedure the rabbits received no solid food for 24 hours and no water for 2 hours before slaughter. The rabbits were killed by cervical dislocation and then skinned. The skin samples were collected from three parts : shoulder, back and rump after air drying.

2 - Items of determination

1 - The area and output of skin
2 - Hair density and fineness
3 - Types of hair fibre
4 - Length of hair fibre
5 - Skin thickness of the different parts.

3 - Methods of determination

1 - The skin area was determined by measuring the length form neck to tailhead and the width of loin

2 - The hair density was determined by counting number of hair fibres per cm² of area and the hair fineness was determined using a projection microscope.

3 - The types of hair fibre were divided into coarse and fine according to morphological and histological structure (TAO, 1992) ; the diameter of fine hair is less than 15μm

4 - 500 pieces of hair fibre from each part were randomly collected to determine the length of hair fibre

5 - The thickness of skins was determined using a micrometer.

RESULTS AND DISCUSSION

1 - Skin area

Table 1 shows that the skin area of Rex rabbit is smaller than that of New Zealand rabbit, but the relative skin area of Rex rabbit is higher than that of New Zealand rabbit. According to China National Native Products and Animal By–Products Import and Exportation Corporation, the grades of Rex rabbit skin are as following :

- the first grade : the total area skin is above 1100 cm².
- the second grade : the total area skin is above 940 cm²

- the third grade : the total area skin is above 770 cm².

The skin area of five month old Rex rabbit greatly surpassed the national standards of the 2nd grade skin. According to the shed of Rex rabbit age, the 4.5–5.0 month old Rex rabbit was most suitable for skinning. Before the second shed of age, the weight of Rex rabbit is 2.5–3.0 kg.

2 - Hair density and fineness

The results of the determination of hair density and fineness are shown in Table 2 and 3.

Table 2 indicates that the hair density of Rex rabbit is 15 000-38 000 fibres/cm². The hair density of the female rabbit is a little higher than that of the male rabbit. The hair density on the different parts of the skin varies : rump > back > shoulder. Compared to New Zealand rabbit, Rex rabbit has higher hair density.

Table 3 shows that the mean diameter of hair fibre of Rex rabbit is 18–19 μm. The diameter of hair fibre on the different parts and of different sexes varies : rump > back > shoulder, and male > female. But the differences are not significant (P>0.05). The diameter of hair fibre of Rex rabbit is larger than that of New Zealand rabbit, but not significantly.

3 - Analysis of types of hair fibre

The results of analysis of the hair fibre types of Rex rabbit are shown in Table 4.

Table 4 indicates that the proportion of coarse hair in Rex rabbit fur is 6–7 %, and the fine hair is 93–94 %. From different parts of the body, the highest proportion of coarse hair is on the shoulder, the next on the back and the lowest on the rump. For the different sexes, the coarse hair proportion of female rabbit seems to have a tendency to be higher than that of male rabbit. Compared to New Zealand rabbit, Rex rabbit has higher proportion of fine hair.

Table 1 : Skin area and output of Rex and New Zealand rabbits.

Variety	Sex	Nb of Animals	Body weight (kg) X ± SD	Skin area (cm²) X ± S D	Relative skin area (cm²/kg) X ± SD
Rex rabbit	Males	3	2.85 ± 0.05	992 ± 96	348 ± 18
	Females	3	2.40 ± 0.13	951 ± 132	399 ± 74
	Mean	6	2.63 ± 0.26	972 ± 96	373 ± 55
New Zealand rabbit	Male	3	3.77 ± 0.21	1273 ± 55	338 ± 14
	Female	3	3.30 ± 0.35	1122 ± 83	341 ± 14
	Mean	6	3.43 ± 0.36	1197 ± 94	339 ± 12

Table 2 : Hair density of Rex and New Zealand rabbits (1 000 fibres/cm²).

Variety	Sex	Number of Animals	Shoulder X ± SD	Back X ± SD	Rump X ± SD
Rex rabbit	Male	3	15.8 ± 4.9	21.3 ± 2.3	35.9 ± 6.6
	Female	3	16.8 ± 2.9	23.1 ± 2.6	38.4 ± 3.9
	Mean	6	16.3 ± 3.7	22.2 ± 2.4	37.1 ± 9.8
New Zealand rabbit	Male	9	8.9 ± 1.3	12.6 ± 6.7	26.3 ± 5.0
	Female	9	11.7 ± 4.1	16.4 ± 5.1	27.2 ± 7.1
	Mean	18	10.3 ± 3.1	14.5 ± 3.8	26.8 ± 5.5

Table 3 : Hair fineness of Rex rabbit and New Zealand rabbits (diameter of hair fibre μm).

Variety	Sex	Number of Animals	Shoulder X ± SD	Back X ± SD	Rump X ± SD
Rex rabbit	Male	3	19.31 ± 0.98	18.88 ± 0.75	18.12 ± 1.05
	Female	3	19.21 ± 0.52	18.72 ± 0.35	17.34 ± 0.59
	Mean	6	19.26 ± 0.71	18.80 ± 0.53	17.73 ± 0.87
New Zealand	Male	3	18.28 ± 1.22	17.34 ± 1.75	16.38 ± 1.52
	Female	3	18.26 ± 0.47	17.33 ± 1.11	16.17 ± 1.03
	Mean	6	18.27 ± 0.83	17.33 ± 1.30	16.28 ± 1.17

Table 4 : Analysis of types of hair fibre of Rex and New Zealand rabbits.

			Proportion of fine and coarse hair (%)					
			Shoulder		Back		Rump	
Variety	Sex	Nb Anim	Fine h. X ± SD	Coarse X ± SD	Fine h. X ± SD	Coarse h. X ± SD	Fine h. X ± SD	Coarse h. X ± SD
Rex rabbit	Male	3	94.1 ± 2.7	5.9 ± 2.8	94.3 ± 2.7	5.7 ± 2.7	96.2 ± 0.5	3.8 ± 0.5
	Female	3	93.0 ± 2.5	7.0 ± 2.5	93.1 ± 1.8	6.9 ± 1.7	95.0 ± 3.0	5.0 ± 3.0
	Mean	6	93.6 ± 2.4	6.4 ± 2.4	93.7 ± 2.1	6.3 ± 2.1	95.6 ± 2.0	4.4 ± 2.2
New Zealand rabbit	Male	3	89.5 ± 3.1	10.5 ± 3.1	91.5 ± 1.2	8.5 ± 1.2	92.5 ± 0.6	7.5 ± 0.6
	Female	3	87.0 ± 1.3	13.0 ± 1.3	89.5 ± 2.5	10.5 ± 2.5	93.2 ± 1.4	6.8 ± 1.4
	Mean	6	88.2 ± 2.6	11.0 ± 2.5	90.5 ± 2.1	9.5 ± 2.1	92.8 ± 1.0	7.2 ± 1.0

Table 5: Length of hair fibre of Rex and New Zealand rabbits.

			Length of fine and coarse hair (cm)					
			Shoulder's hair		Back's hair		Rump's hair	
Variety	Sex	Nb Anim	Fine X ± SD	Coarse h. X ± SD	Fine X ± SD	Coarse X ± SD	Fine X ± SD	Coarse X ± SD
Rex rabbit	Male	3	1.89 ± 0.09	1.86 ± 0.10	1.97 ± 0.11	1.92 ± 0.11	2.11 ± 0.06	2.05 ± 0.06
	Female	3	1.77 ± 0.19	1.72 ± 0.20	1.88 ± 0.18	1.84 ± 0.17	2.01 ± 0.27	1.96 ± 0.25
	Mean	6	1.83 ± 0.15	1.78 ± 0.16	1.93 ± 0.14	1.88 ± 0.14	2.06 ± 0.18	2.01 ± 0.18
New Zealand rabbit	Male	3	2.12 ± 0.04	3.22 ± 0.05	2.21 ± 0.02	3.33 ± 0.08	2.38 ± 0.03	3.45 ± 0.07
	Female	3	2.19 ± 0.11	3.26 ± 0.17	2.23 ± 0.07	3.17 ± 0.19	2.40 ± 0.19	3.49 ± 0.17
	Mean	6	2.16 ± 0.08	3.24 ± 0.10	2.22 ± 0.05	3.25 ± 0.15	2.39 ± 0.07	3.47 ± 0.12

4 - Length of hair fibre

Table 5 shows that the length of fine hair is 1.83–2.06 cm and that of coarse hair is 1.79–2.01 cm. The difference is not significant (P>0.05). It indicates that both coarse and fine hair of Rex rabbit have almost the same length.

From the different parts, the longest hair fibre is on the rump, secondly on the back and the shortest on the shoulder. However these differences are not significant (P>0.05). But the difference of hair length of New Zealand rabbit between coarse and fin hair is significant. It shows that Rex rabbits have characteristics of almost the same length of hair on the whole body, compared with New Zealand rabbit.

The hair of male rabbits is longer than that of female ones. But the difference is not significant (P>0.05). The length of hair fibre of Ram rabbit is 2.5–3.0 cm, and that of Angora is 6.0–10.0 cm (ZHENG, 1992). Thus, Rex rabbit fur has characteristics of shortness and homogeneity.

5 - Thickness of skin of the different part of Rex rabbit

The thickness of the skin from different parts is shown in Table 6.

Table 6 shows that the thickness of the skin on the shoulder, back and rump of Rex rabbit is 1.80, 1.91 and 2.07 mm, respectively. The skin of male rabbits is thicker than that of female ones. However, the difference between shoulder and rump and the difference between back and rump of male rabbits are a little higher than that of the female ones. But the difference is not significant (P>0.05). The skin of New Zealand rabbit is significantly thicker than that of Rex rabbit.

Table 6 : Skin thickness of different parts of Rex and New Zealand rabbits (cm).

Variety	Sex	Nb of Anim.	Shoulder X ± SD	Back X ± SD	Rump X ± SD
Rex rabbit	Male	3	1.88 ± 0.19	1.95 ± 0.10	2.08 ± 0.06
	Female	3	1.72 ± 0.24	1.86 ± 0.16	2.06 ± 0.15
	Mean	6	1.80 ± 0.19	1.91 ± 0.14	2.07 ± 0.10
New Zealand rabbit	Male	3	2.67 ± 0.61	2.77 ± 0.62	2.92 ± 0.59
	Female	3	2.51 ± 0.42	2.65 ± 0.59	2.92 ± 0.60
	Mean	6	2.57 ± 0.49	2.77 ± 0.58	2.92 ± 0.56

CONCLUSION

1 - Studies on the characteristics of Rex rabbit skin shows that Rex rabbit has a larger skin area, expressed in proportion of the live weight, than the New Zealand rabbit. So the utilization ratio of its skin is high. The Rex rabbit fur has characteristics of high hair density, normal diameter and almost same length of hair fibre for all types of hair (fine and coarse) and from different parts of the body, and even thickness of the whole skin. So Rex rabbit fur has short, dense, smooth and beautiful hair and is an excellent material for fur.

2 - Speaking of the sex difference, the hair density, the fineness of fine hair, the type and length of hair fibre, the thickness of skin and its deviation between the different parts of five month old male and female rabbits are not significant (P>0.05). So in practice, under the same raising conditions, the quality of the skin of the commercial Rex rabbits has no significant sex difference if the rabbits are skinned at the right age.

3 - Concerning the skin area, the skin area of a five month old Rex rabbit accords with the standards of the grade skin. In the production practice, the skin of Rex rabbits is usually ripped when they are 4.5–5.0 months old and have a weight of 2.5–3.0 kg, that is, after the first shed and before the second shed. The time when the skin has bright and standard colour, dense and fine hair, is the best time for Rex rabbit skinning.

4 - Many properties of Rex rabbit skin have close relationship with the property of the variety and raising conditions. Especially, the hair density and smoothness are affected not only by the genetic factors, but also by the environmental conditions. Unsuitable raising conditions and ignoring the selection and breeding of the variety would induce degeneration of the variety and reduce the quality of the skin (ZHENG, 1192).

5 - Rex rabbits have many different skin colours. Some of them are fixed through long period of selection and breeding. Some, for examples red and blue rabbits, are still in the state of separation, which is expected to be fixed. The quality characteristics of Rex rabbit's fur of other colour than white is to be studied in the future.

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