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STUDIES ON GROWTH DEVELOPMENT AND WOOL PRODUCTION OF SHEARING ANGORA RABBIT

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ABSTRACT

The analysis of growth development and wool production in 100 Luxi Shearing coarse Angora rabbit shows : the adult body weight of male and female rabbit was 4.59kg and 5.15kg; annual wool yields of adult male and female rabbit were 1331.97g and 1388.12g; the fineness of adult rabbit under wool and coarse wool were 14.11 μ m and 42.31 μ m; the coarse wool ratios of adult rabbit were 13.40% and 13.60%; the staple lengths of adult rabbit were 5.38cm and 5.32cm(90d), respectively.

Key words: Angora rabbit, Body weight, Wool yield, Coarse wool ratio, Correlation coefficient

INTRODUCTION

Coarse wool ratio has become a very important commercial trait in Angora rabbit production because it connected with the benefits of rabbit raising farm. In 1982, for increasing the coarse wool ratio and wool yield of Chinese Angora, we cross Chinese Angora with German Angora, some coarse wool Angora breeds in China and some meat-purpose rabbit breeds such as New Zealand. From 1994, we fitted and selected these high wool yield and coarse wool ratio hybrid Angora rabbits. Now, we had 8th generation rabbits. For determining the effect of these Angora rabbits, we measured growth development and wool production of 100 Luxi Shearing coarse Angora rabbit in nucleus herd.

MATERIALS AND METHODS

Animals and Diets

100 rabbits (50 male and 50 female) of 2 monthss, 5 months, 8 months, 11 months and adult from nucleus herd were measured. The wool of hip cross was analyzed for the wool quality. Experimental rabbits were weaned in 35d and supplied with pellets feed. Pellets feed was given twice every day. The component of pellets feed was shown in table 1.

Table 1 The component of pellets feed(%)

	Young rabbit	Pregnant rabbit	Suckling rabbit	Male rabbit
Cooked Soybean	11	12	15	11
Wheat bran	30	29	26	29
Grass meal	35	35	35	35
Corn	18	18	18	18
Yeast	2.5	2.5	2.5	2.5
Fish meal	2	2	2	2
NaCl	0.5	0.5	0.5	0.5
Bone meal	0.5	0.5	0.5	0.5
Premix	0.5	0.5	0.5	0.5

Note: Premix—Trace elements 0.1%, VA and VD₃ 0.1%, Choline 0.1%,Methine 0.2%.

Experimental Methods

The shearing period was related to the measurement of body size and weight. The first harvest is at 60 days of age and after the harvest interval is equal to 90 days.. After sheared wool, the body size (body length and chest girth), body weight and wool yield were measured ; and the annual wool yield was calculated.

The wool sample of hip cross was measured for length, fineness, classification and coarse wool ratio. The length of rabbit wool means staple length after sheared wool.

Data Statistics and Analysis

Mean, standard deviation and correlation coefficient of traits were calculated. The regression equations of wool yield and body weight, body length and chest girth were calculated.

RESULTS AND DISCUSSION

Body size, body weight, the diameter of different type wool and wool yield are shown in table 2.

Body length, chest girth and body weight had significant differences among different ages ($p < 0.01$). There is no significant difference of body length, chest girth and body weight between 8 months and adult rabbit ($p > 0.05$). It means that all these traits of 8 months reach adult level. All traits of male and female rabbits were similar and these traits of female rabbits were higher than male rabbits after 5 months. I It means that female rabbits had higher growth ratio than male rabbits after 5 months. The adult weight of male and female rabbits was 4.59kg and 5.15kg. Annual wool yield of adult male and female rabbit were 1333.97g and 1388.12g, respectively. The adult weight of adult female was 12.20% more than adult male rabbit, annual wool yield of adult female was 4.22% more than adult male rabbit.

The fineness of undercoat and coarse wool of male and female rabbits raised when age increased. The fineness of undercoat and coarse wool of male and female rabbits at 11 months was similar to adult rabbit fineness.

Table 2 Body size, body weight, diameter of different types of wool and wool yield (Mean and standard deviation)

Sex	Age (months)	Weight (kg)	Body length (cm)	Chest grith (cm)	Undercoat (μm)	Coarse wool (μm)	Wool Yield (g)	Annual wool yield (g)
♂	2	1.06C ±0.01	28.5B ±2.31	19.6B ±1.1	12.34 ±0.56	36.78 ±2.36	--	--
	5	3.46B ±0.25	44.8A ±3.21	29.3A ±2.31	13.22 ±0.76	38.27 ±2.18	204.4 ±18.7	--
	8	3.74B ±0.34	46.4A ±3.46	31.3A ±3.05	13.67 ±0.54	37.46 ±3.26	226.2 ±20.5	--
	11	4.44A ±0.40	49.0A ±4.35	31.3 A ±3.05	13.98 ±0.67	41.42 ±3.81	229.0 ±31.5	--
	adult	4.59A ±0.36	50.0A ±4.6	32.0A ±2.76	14.14 ±0.58	42.32 ±2.46	237.2 ±30.6	1331.97 ±126.7
♀	2	1.03C ±0.11	28.2B ±2.61	20.9B ±2.01	12.76 ±0.63	37.21 ±2.16	--	--
	5	3.45B ±0.30	45.8A ±4.36	30.6A ±2.76	13.76 ±0.36	38.76 ±1.86	187.2 ±16.8	--
	8	3.96B ±0.31	48.0A ±4.05	31.4A ±2.87	13.51 ±0.66	39.16 ±4.21	238.0 ±22.1	--
	11	4.45A ±0.45	49.2A ±3.78	31.5 A ±3.25	14.21 ±0.68	42.31 ±2.18	250.4 ±27.6	--
	adult	5.15A ±0.47	51.8A ±5.26	33.3A ±3.47	14.08 ±0.48	42.30 ±2.16	247.2 ±28.6	1388.12 ±140.6

Note: A,B,C and D mean significant at 1% level.

The amount ratio, weight ratio and coarse wool ratio of different type wool are shown in table 3.

Table 3 Classification and coarse wool ratio of wool fiber(%)

Sex	Age (months)	Amount ratio			Weight ratio			Coarse wool ratio
		Undercoat	Heterotypical fiber	Hair	Undercoat	Heterotypical fiber	Hair	
♂	5	98.56±0.39	0.32±0.03	1.12±0.11	88.73±3.08	3.41±0.17	7.86±0.25	11.27b±2.56
	8	98.37±1.21	0.33±0.05	1.29±0.09	87.04±4.26	3.56±0.08	9.41±0.13	12.96a±2.36
	11	98.12±1.08	0.35±0.04	1.53±0.05	86.91±3.15	4.00±0.09	9.09±1.17	13.09a±1.77
	adult	96.07±1.76	1.37±0.06	2.57±0.11	86.60±2.17	4.15±1.08	9.25±2.31	13.40a±5.01
♀	5	98.41±0.76	0.51±0.04	1.08±0.13	88.67±3.21	1.96±0.09	9.37±0.33	11.33b±1.89
	8	98.33±1.56	0.53±0.06	1.15±0.08	87.46±5.22	2.00±0.06	10.54±0.39	12.54a±2.76
	11	97.81±1.35	0.50±0.01	1.69±0.10	86.85±3.06	2.86±0.05	10.29±0.47	13.15a±2.61
	adult	97.25±2.38	0.48±0.03	2.27±0.50	86.40±4.11	3.34±1.20	10.26±2.51	13.60a±5.45

Note: a,b mean significant different at 5% level.

Table 3 shows that the coarse wool ratio increased when age raised. Compared with 5 months, coarse wool ratio of 8 months, 11 months and adult rabbit were higher ($p < 0.05$). Because of reproduction, male and female rabbits of 8 months, 11 months and adult need more nutrients. If ill-nourished, some secondary hair follicles were inactive and undercoat decreased.. Coarse wool was not affected by nutrition.

The staple length is mainly affected by shearing period. The staple length of 2 months male and female rabbits (60d) of Shearing Angora rabbit nucleus herd was 4.15 ± 0.31 cm and 4.10 ± 0.47 cm, respectively. The staple length of 5 months male and female rabbits (85d) of Shearing Angora rabbits nucleus herd was 5.40 ± 0.27 cm and 5.42 ± 0.29 cm, respectively. The staple length of 8 months male and female rabbits (85d) was 5.50 ± 0.25 cm and 5.51 ± 0.36 cm, respectively. The staple length of 11 months male and female rabbits (85d) was 5.46 ± 0.41 cm and 5.41 ± 0.24 cm, respectively. The staple length of adult male and female rabbits (85d) 5.38 ± 0.25 cm and 5.31 ± 0.30 cm, respectively. The staple length of adult male and female rabbits was shorter than those at 2, 5, 8 and 11months.

Ignoring age, the correlation coefficient of body size and body weight was shown in table 4.

Table 4 The correlation coefficient of body size and body weight

Trait	Body length	Chest girth	Wool yield
Body weight	0.9501**	0.9733**	0.8199**
Body length		0.9349**	0.8166**
Chest girth			0.7342**

Note: ** mean $p < 0.01$.

The correlation of body size and body weight traits was significant at 1% level. Among of them, the correlation coefficient of chest girth size and body weight was the highest(0.9733).

For estimating wool yield, the regression equation was shown in table 5.

Table 5 The regression equation of estimating wool yield

Independent variable	Regression equation	Correlation coefficient
Body length	$Y(\text{wool yield, g}) = -133.47 + 7.50X$	$r = 0.8116$
Chest girth	$Y(\text{wool yield, g}) = -211.21 + 14.00X$	$r = 0.7342$
Body weight	$Y(\text{wool yield, g}) = 106.36 + 29.14X$	$r = 0.8109$

CONCLUSION

This paper presents the analysis of growth development and wool production in 100 Luxi Shearing coarse Angora rabbits. Body size, body weight, wool yield and fineness of undercoat and coarse wool increased when age raised; these traits stabilized at 11 months and reached adult level. Comparing different sex, all traits of female rabbits were higher than male rabbits after 5 months. So, growth development and wool yield of female rabbits were higher than male rabbits with the same feed and management.

The adult body weight of male and female rabbits was 4.59kg and 5.15kg, average weight was 4.87kg; annual wool yield of adult male and female rabbit was 1331.97g and 1388.12g, average annual wool yield was 1359.55g; the fineness of adult rabbit under wool and coarse wool was $14.11\mu\text{m}$ and $42.31\mu\text{m}$; the coarse wool ratio of adult rabbit was 13.40%

and 13.60%, average coarse wool ratio was 13.50%;the staple length of adult rabbit was 5.38cm and 5.32cm(90d).

The correlation analysis of body size, weight and wool yield shows that there were strong correlations among body size, body weight and wool yield ($p < 0.01$). So, selecting one or two traits will improve the other traits in individual selection and is available at the production level.

Replacement female rabbits and adult female rabbits need strict feeding and management because body size, body weight and wool yield of female rabbit were higher than male rabbit after 5 months.