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65 EFFECT OF BREED AND SEX ON PELT GROWTH OF NEW ZEALAND
WHITE AND CHINCHILLA GIGANTAS RABBITS

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Abstract

New Zealand White and Chinchilla Giganta rabbits are breeds of rabbits popularly known for their meat production and pet strain and usually produce top quality pelts when slaughtered. As the rabbits increased in sizes, so also are the pelt weight and pelt area which corresponded to the body volume and the vastness of the pelt. The research aim was to study the effect of breeds and sexes on the development of pelt. A total of 216 (54 males and 54 females of NZW; 54 males and 54 females of the Chinchilla Giganta) rabbits were used in this research. Data were analysed with analysis of variance using GenStat software and the pelt area was calculated using ImageJ analysis. Variables observed were pelt weights and pelt area. The results showed that sexes had no interaction on pelt area but the breed does, and as the rabbit's increases in age, so also the increase in pelt weight and pelt area.

KEYWORDS: Sex, Breed, Pelt, New Zealand White, Chinchilla, Rabbit

INTRODUCTION

New Zealand White (NZW) and Chinchilla Giganta rabbits are one of the most popular rabbit breeds in the world, known for their meat production and pet strain (Ozurlu *et al.*, 2009; Galal *et al.*, 1994). New Zealand White rabbit has a short, soft fly back and tight-set white fur in the pelt while the Chinchilla Giganta are grey in colour and produce a top quality pelt when slaughtered. However, their intensive meat rabbit production techniques are frequently incompatible with quality fur pelt production standards (Lebas *et al.*, 1997). Although meat is the main goal of rabbit production, furs and pelts are by-products that are usually recovered from skins with no particular production constraints (Lebas *et al.*, 1997). The New Zealand White and the Chinchilla Giganta rabbits has high-quality skins that are used in fur garments, trimming, medical and cosmetic research, and other applications (Taha *et al.*, 2006). Several factors influence the characteristics of animal skins, including sex, seasonal variations, production system, and slaughtering ages (Taha *et al.*, 2006; Lebas *et al.*, 2007; Taha *et al.*, 2017). Rabbit pelts have a low monetary value compared to other by-product of live animals (Lebas *et al.*, 2007). Several studies have shown that several factors affect the properties of rabbit pelts, but there is a lack of evidence regarding the effect of breeds and sexes on the

characteristics and development of New Zealand White and Chinchilla Giganta rabbit pelts. As a result, the purpose of this study was to investigate into the effect of breeds and sexes on the growth of the pelt of New Zealand White and Chinchilla Giganta rabbits.

MATERIALS AND METHODS

Two hundred and sixteen (216) rabbits of 108 (54 males and 54 females) New Zealand White (NZW) and 108 (54 males and 54 females) Chinchilla Giganta rabbits were used for this study. The two (2) strains of rabbits after slaughtering, were defured, and the weight (g) of the pelts were also recorded at various slaughtering ages (21, 28, 35, 42, 56, 70, 84, 112 and 140 days). The first cut was usually an incision at the hind feet, passing from one thigh to the other, then the skin was pulled off in one piece after which the skin will be opened up. The surface area was determined by spreading the pelt over a hard surface and the outline traced. The traced version was subjected to free draw and the surface area determined by means of image analysis (ImageJ). The area (sq.cm) of the pelts were recorded using ImageJ analytical software. The data generated were subjected to statistical analysis of variance using GenStat, 2020 version.

RESULTS AND DISCUSSION

The weight and area (cm²) of the pelt of male and female New Zealand White rabbits at their respective slaughter ages (days) were presented in Table 1 and Figure 1. More so, the weight and area (cm²) of the pelt of male and female Chinchilla Giganta rabbits at their respective slaughter ages (days) were presented in Table 2 and Figure 2. There were significant differences ($P < 0.001$) in the pelt area of male and female NZW rabbits, as the rabbits increased in age until day 42, when almost all the rabbits retained their mature pelt areas. Significant differences ($P < 0.001$) were recorded in the breed against the sex and breed.sex of the chinchilla Giganta which were not significant ($P > 0.05$). There was progressive linear increase in the pelt area of male and female Chinchilla Giganta between 21 – 140 days. The mean pelt area (995.8 cm²) of the female Chinchilla Giganta was slightly higher than that of the male (994.3 cm²), while the male (1071.6 cm²) was higher than the female (1058.8 cm²) in the New Zealand White rabbits.

As the rabbits (New Zealand White and Chinchilla Giganta) increased in sizes, so also are the pelt weight and pelt area which corresponded to the body volume and the vastness of the pelt. The vastness of the fresh pelt increased and matched with pelt weight because the rabbits' size

(or weight) translated to a higher vastness of the pelt due to the accumulation of fat under the skin.

The results obtained in this study are at variance with the findings of Tao (1994), which stated that New Zealand White crossbreed rabbits weighing 3.43 ± 0.36 kg at day 105 had a pelt area of $1.197 \pm 0.94 \text{cm}^2$. The result of this research is in line with the result of Maynard and Loosely (1969) which demonstrated that an increase in the weight of rabbits would be accompanied by an increase in rabbit pelt's area. The pelt area in this study was not affected by sex, but the pelt of male rabbits was significantly larger than the female rabbits in the New Zealand White. This could be because male rabbits are usually fed for meat and maintenance purpose only unlike the female rabbits that go through the process of reproduction and lactation. This result may explain the decrement of follicle density in the skins of male rabbits. However, previous studies showed that the fibre density was significantly higher in female rabbits than that of the male rabbits (Ozurlu *et al.*, 2009; Tao, 1994), while the significant difference between the two sexes in this study were not in agreement with Yagci *et al.* (2006).

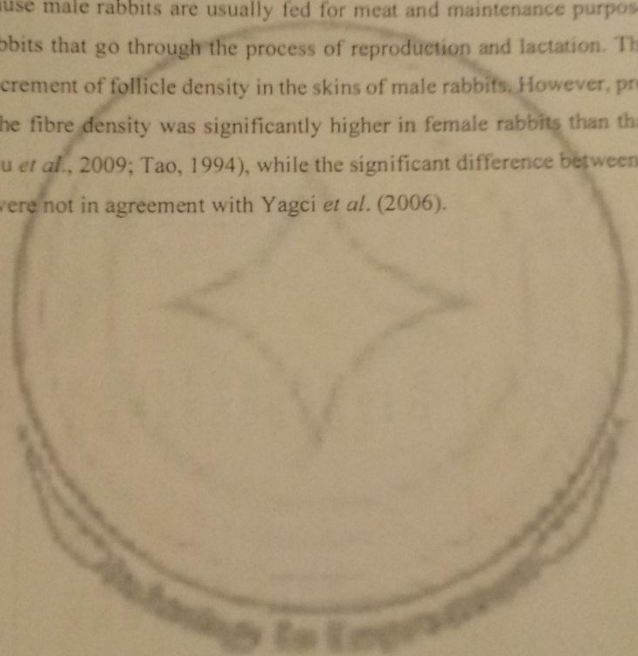


Table 1: Weekly mean pelt weight (g) and pelt area (cm²) of female and male New Zealand White rabbits.

Age (Days)	Pelt weight		Pelt area		Mean (cm ²)
	F	M	F	M	
21	69.2	66.3	789.7	809.4	799.6
28	86.0	78.1	1008.3	1013.0	1010.7
35	126.4	129.9	1109.7	1175.0	1142.4
42	192.5	197.8	1161.9	1138.6	1150.3
56	214.0	192.1	1126.8	1097.0	1111.9
70	222.9	230.0	1167.3	1172.1	1169.7
84	315.9	331.1	1109.2	1191.7	1150.5
112	386.7	372.7	1222.0	1118.7	1170.4
140	367.3	462.6	1179.1	1258.0	1218.6
Mean	220.1	228.9	1097.1	1108.2	1102.7
LSD	Breed ns	Sex ns	Breed ***	Sex ns	Breed.sex ns
SEM	8.94	4.00	22.31	9.98	31.55
RMS	959.4		5974.0		

Table 2: Weekly mean pelt weight (g) and pelt area (cm²) of female and male Chinchilla Giganta rabbits.

Age (Days)	Pelt weight (g)		Mean (g)	Pelt area (cm ²)		Mean (cm ²)
	F	M		F	M	
21	34.4	37.5	35.9	783.8	798.2	791
28	68.3	70.5	69.4	799.8	780.7	790.2
35	77.3	75	76.1	885.7	876.9	881.3
42	146.5	166.7	156.6	934	914.5	924.2
56	224.9	226	225.4	965.6	926.7	946.2
70	245.6	203.1	224.3	1015.8	1091.3	1053.6
84	237.8	230	237.4	1125.1	1119.4	1122.2
112	338.2	337	337.6	1196.7	1207.9	1202.3
140	384.7	394.8	389.7	1255.7	1233.1	1244.4
Mean	195.3	193.4	194.7	995.8	994.3	995
LSD	Breed ***	Sex ns	Breed,sex ***	Breed ***	Sex ns	Breed,sex ns
SEM	3.29	1.47	4.65	5.93	12.59	17.80
RMS		129.9			1901	

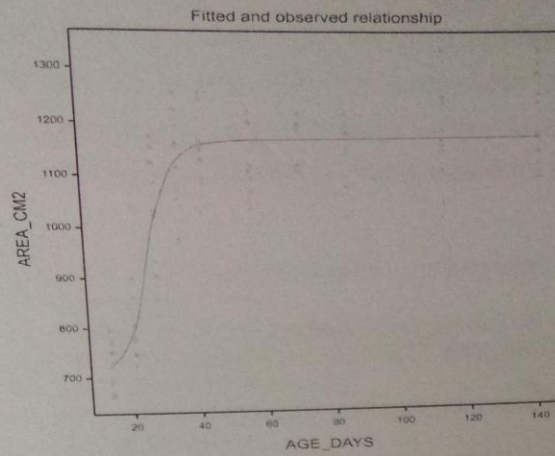


Figure 1: Fitted and observed relationship of the pelt area (cm^2) of male and female New Zealand White rabbits at their respective slaughter ages (days)

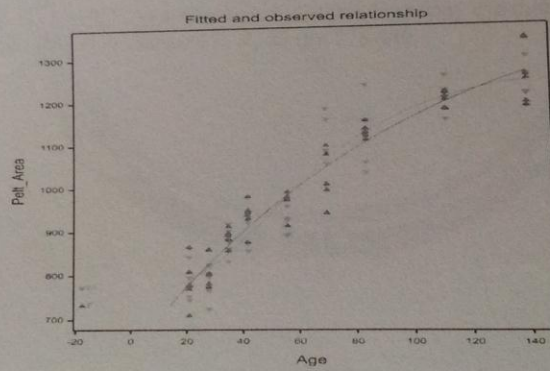


Figure 2: Fitted and observed relationship of the pelt area (cm^2) of male and female Chinchilla Giganta rabbits at their respective slaughter ages (days).

CONCLUSION

This current study showed a variation in the pelts developments due to breed and sexes of New Zealand White and Chinchilla Giganta rabbits. The findings highlighted that the mean pelt area was higher in the male than the female of the New Zealand White rabbits, while the pelt area of the female was higher than that of the male rabbits in the Chinchilla Giganta. This showed that the Chinchilla Giganta had higher pelt area than the New Zealand White rabbits.

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