

Phenotypic and Morphometric characteristics of Angora Rabbits in Rabbit Model Farm JabbaMansehra Khyber Pakhtunkhwa-Pakistan

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Abstract

A research study was carried out at Angora rabbit model farm JabbaMansehra Khyber PakhtunkhwaPakistan to document the phenotypic and morphometric characteristics of Angora rabbits. Fifteen male and fifteen female were selected for study. Phenotypic characteristics (color of coat, eye, eyelashes, muzzle,fore head and tail claw) were recorded visually. The color of coat, eyelashes, muzzle, fore head was white. Eye was noted to be pink or light red and tail claw was off white.Morphometric measurements(body length, heartgirth,height,tail length,earlength,earwidth,necklength,space between two rear teat, space between two middle teat, space between front and rear teat, headlength, fore head width) was recorded by using measuring tape.. In female rabbit mean body length, heart girth, and height of body was 112.93 ± 1.07 , 11.82 ± 1.44 , and 121.35 ± 1.95 inches. Mean tail length, ear length, ear width and neck length was noted to be 3.45 ± 0.55 , 3.87 ± 0.335 , 2.71 ± 0.53 and 2.61 ± 0.552 inches. Space between two rear teats, space between two middle teats, space between two front teats and spc between front and rear teats was found to be 1.77 ± 0.22 , 2.81 ± 0.53 , 2.85 ± 0.38 , 6.87 ± 1.05 while mean head length, fore head width was 4.80 ± 0.61 , $2.63\pm .54$ inches respectively. In male Rabbits mean body length, heart girth and height of the body was 13.20 ± 1.04 , 13.20 ± 1.04 and 10.40 ± 1.14 . Mean tail length, ear length and ear width was 3.36 ± 0.410 , 3.96 ± 2.89 , 2.76 ± 0.25 while mean head length, fore head width and mean neck length was, 4.90 ± 0.894 , 2.48 ± 0.563 and 2.60 ± 0.651 inches respectively. The present study helped to document the phenotypic characteristics and morphometric measurements of Angora rabbits in our country.

Keywords:Angora rabbits, phenotypic, morphometric, colour, sex, Peshawar.

1 INTRODUCTION

Most of the world's human population is fed on food produced on small farms which have continued to get smaller as the human population pressure increases (McIntire et al., 1992). This has led to the need to search for alternative protein sources that are cheap, readily available and pose minimal competition to man in their food demand (Akinmutimi, 2007). Based on these facts, The rabbit's high prolificacy, fast growth rate, high genetic selection potential, high feed conversion efficiency and economic utilization of space (Lebas, 1997; Hassan et al., 2012) make them a viable option.

Rabbit breeds are distinctively identified phenotypically by body size, shape and the coat color (Lebas et. al., 1997). Using this basis of classification, American rabbit breeders association (2010) recognized 47 distinct rabbit breeds of which only a few are kept in Kenya (MOLD, 2010). The most common rabbit breeds in

Kenya include: New Zealand white, Californian, Chinchilla, French Lop, Dutch, Checkered giant, Flemish giant, Angora and Rex. Rabbits have further been classified as: small sized rabbits weighing about 1.4 – 2kg at maturity, medium sized breeds weighing 4–5.4kg and large breeds weighing 6.4 – 7.3kg (USDA, 1972). In this classification New Zealand white and Californian white are medium sized breeds. They are the most popular for meat production due to good growth characteristics and a high meat: bone ratio (Oseni, 2008; Mailafia et al., 2010). The New Zealand white is also well recognized as a dam breed based on its outstanding maternal genetic merits for litter size, milking, and general mothering ability (Lebas et al., 1997; McNitt et al., 2000). The good attributes of the two breeds are due to their specific selection for improved reproductive performance (King, 1978; Owen, 1981).

Rabbits are animals with high reproductive potentials and fast growth rate. Other attributes are short gestation period, early sexual maturity and ability to rebreed shortly after kindling. These qualities confer on rabbits a potential to bridge the shortage of animal protein in developing countries. The practical potential of rabbit meat in supplying world's protein needs has been reported (Rao et al., 1977).

Angora rabbits produce fibers called Angora, which belongs to the luxury animal fibers category. The projection microscope method for measuring fiber diameter in Angora rabbits has been used in some studies (Rougeot and The'bault 1983, 1989; Qi et al., 1994; The'bault and Vrillon, 1994; Olmez and Dellal, 2002; Risam et al., 2005).

The Angora rabbit fleece is made of different kinds of medullated fibers that have a variable cross-section shape between and along the fiber. A rapid method for measuring cross-section characteristics of the different fiber types of the Angora rabbit fleece has been proposed (Allain and the'bault, 1996). Morphometric equations can be used to predict growth trait with heart girth, body length, height at wither, giving the best prediction. Coefficients of variation for production and reproduction traits in this study were noted to be high. Elaminet al. 2011.

Rabbits (*Oryctolagus cuniculus*) produce large quantities of tasty meat for domestic consumption (Wilson, 1995). Rabbit meat is high in protein, about 22 %, low in fat, 4 % and cholesterol, 5 % and thus possesses health promoting qualities (Aduku and Olukosi, 1990).

The present study is therefore designed to assess the phenotypic and morphometric characteristics of Angora rabbits.

1.1 Objectives

The following objectives were studied

- 1 To assess the phenotypic characteristics of Angora rabbits.
- 2 To evaluate morphometric measurements of Angora rabbits.

2 MATERIAL AND METHODS

Present study was carried out at Angora rabbit model farm Jabba Mansehra Khyber Pakhtunkhwa Pakistan. Fifteen male and fifteen female rabbits of same age and body weight were selected in model farm. The climate is warm and temperate in Mansehra. The rainfall in Mansehra is significant, with precipitation even during the driest month. The average annual temperature in Mansehra is 18.5 °C. In a year, the average rainfall is 1445 mm.

3 Phenotypic and Morphometric characteristics:

Physical characteristics (color of coat was white, eye, eyelashes, muzzle, fore head and tail claw) were recorded visually. Morphometric measurements (Body length, heart girth, height, tail length, ear length, ear width, neck length, space between two rear teat, space between two middle teat, space between front and rear teat, head length, fore head width) was recorded by using measuring tape.

4 Result & Discussion

4.1 Phenotypic and Morphometric characteristics of Angora rabbits.

Table 1 revealed different Physical characteristics and found that colour of coat, eyelashes, muzzle, fore head was white. Eye was noted to be pink or light red and tail claw was off white. The domesticated rabbit has extremely diverse characteristics, varying in colour through every grade, shade, and mixture, from pure white to all black; in coat from very short to long, silky hair capable of being woven; and in style of ears from the prick ear—erect, small and almost as stiff as metal—to the floppy, broad, soft-skinned lopped ear, which hangs to the ground (Redmond, 2009). Akugre (2010) reported white, red, black, ash and mixed colour varieties of rabbits from the Upper East region of Ghana. He noted that farmers use colour of fur and behaviour to classify rabbit. According to Sanford (1996), all domestic rabbits throughout the world are the same species, *Oryctolagus cuniculus*.

Table 1 Phenotypic characteristic of Angora rabbit

Variable	Colour
Eye	pink or light red
Eye lashes	white
Muzzle	white
Fore Head	white
Coat	white
Tail	white
Claw	Off white

Morphometric characteristics have been given in table 2. In female rabbit mean body length, Heart girth, height, tail length, ear length, ear width, neck length, S.R.Teet, S.M.Teet, aS.F.teat, S.F.R.teat, head length, F.H.Width 12.93 ± 1.07 , 11.82 ± 1.44 , 121.35 ± 1.95 , 3.45 ± 0.55 , 3.87 ± 0.335 , 2.71 ± 0.53 , 2.61 ± 0.552 , 1.77 ± 0.22 , 2.81 ± 0.53 , 2.85 ± 0.38 , 6.87 ± 1.05 , 4.80 ± 0.61 , $2.63 \pm .54$ inches respectively.

Table 2 Morphometric measurements of female Angora rabbits

Variable	Min.value	Max.value	Mean	Mean SE
Body length	11.00	15.00	12.9267	1.07734
Heart girth	10.00	15.00	11.8200	1.44182
Height	8.50	14.80	12.3533	1.95480
Tail Length	3.00	5.00	3.4467	.55403
Ear length	3.00	4.30	3.8733	.33481
Ear width	1.80	3.50	2.7067	.53247
Neck length	1.80	3.50	2.6133	.52217
S.R.T	1.50	2.00	1.7733	.21865
S.M.T	2.00	4.00	2.8133	.53301
S.F.T	2.50	4.00	2.8467	.37007
S.F.R.T	5.00	8.40	6.8667	1.04790
Head length	4.00	6.00	4.8000	.60945
F.H.W	1.80	3.50	2.6333	.54204
Valid N (listwise)				

S.R.T =Space between two rear teat S.M.T =Space between two middle teat
 S.F.T =Space between two front teat S.F.R.T= Space between front and rear teat
 F.H.W =Fore head width

In Table 3 male Rabbits body length, mean heart girth, height, mean tail length, ear length, Ear width, head length and F.H width were 13.20 ± 1.04 , 13.20 ± 1.04 , 10.40 ± 1.14 , 3.36 ± 0.410 , 3.96 ± 2.89 , and 2.76 ± 0.25 inches, mean neck length, head length and fore head width were 2.48 ± 0.563 , 4.90 ± 0.894 and 2.60 ± 0.651 inches respectively.

Table 3 Morphometric measurements of male Angora rabbits

Variable	Min,value	Max.value	Mean	Mean SE
Body length	12.00	14.50	13.2000	1.03682
Heart Girth	12.00	14.50	13.2000	1.03682
Height	9.00	12.00	10.4000	1.14018
Tail length	3.00	4.00	3.3600	.49800
Ear length	3.50	4.30	3.9600	.28810
Ear width	2.50	3.00	2.7600	.25100
Neck length	2.00	3.30	2.4800	.56303
Head length	4.00	6.00	4.9000	.89443
F.H.W	2.00	3.50	2.6000	.65192
Valid N (listwise)				

F.H.W= Fore head width

Morphometric measurements have been used to evaluate the characteristics of various breeds of animals, and could provide useful information on the suitability of animals for selection (Yakubuet *al.*, 2010; Martins *et al.*, 2009; Araujoet *al.*, 2006; Mwacharoet *al.*, 2006; Rastijaet *al.*, 2004; Nesamvuniet *al.*, 2000).

Hassan et al.2012 reported that coefficients of variation varied from high to low, being high for body weight and height at wither, moderate for heart girth. These coefficients are high than those obtained by Orheruata et al., (2006). However, Karima et al., (2002) found fairly high coefficients in the pre-weaning periods. The depict sex effects on linear body measurements of rabbits. Traits that were significantly affected ($P \leq 0.05$) by sex were: heart girth at 3 month of age (males being higher in estimates), heart girth and fore limb length at 5 month of age (males being higher in estimates) and abdominal circumference and tail length at over

12 month of age (females being higher in estimate for both traits) noted by Hassan et al.,(2012).

5 Conclusion and Recommendations

- 1 Color of coat,eyelashes,muzzle,fore head was white. Eye was noted to be pink or light red and tail claw was off white.
- 2 Mean body length and heart girth was higher in male Angora rabbits than female rabbits while height of the body of male rabbits was lower than female rabbits.
- 3 More research works should be conducted on characterization of the indigenous rabbit including phenotypic, genetic, molecular, and immunological characterization and genetic parameter estimation.
- 4 Selection and breeding programs should be carried out to improve the production performance of local rabbits.

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