

## Effect of shearing intervals on the growth and wool parameters of German Angora rabbits

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### ABSTRACT

An experiment was undertaken on 138 German Angora weaners divided into 3 equal groups of 46 each, kept individually in standard size iron cages and provided similar housing and management. After first shearing at the age of 50 days; rabbits of the group 1, 2 and 3 were sheared at 65, 70 and 75 days interval, respectively, from second to seventh shearing. Parameters recorded were body weight after shearing (kg), wool yield (gm), staple length (cm), fiber diameter ( $\mu\text{m}$ ), medullation (%) and guard hairs (%). In each group, significant gain in the body weight was observed from second to seventh clip; however, between groups this gain was significant ( $P < 0.05$ ) from second to fourth shearing. At seventh shearing body weights in all groups were same. Overall pooled body weights for each group had a non-significant increase with decrease in the shearing interval from 75 to 65 days. For wool yield no definite trend was recorded, however, the correlation between the body weight and wool yield for different groups was highly positive. Average pooled wool yield for group 3 was significantly ( $P < 0.05$ ) higher than the group 1 and 2, and was numerically more in-group 2 than group 1. However, the wool yields per clip in the group 1 and 2 were obtained at the lesser age of rabbits than group 3. The staple length decreased significantly with decrease in the shearing interval. The pooled staple length at 70 days shearing interval was more than 5 cms (first class wool) as desired for the spinning of yarn. Decrease in the shearing interval made fibers finer; but had no effect on the medullation and guard hairs. Thus, it was concluded that the shearing at 70 days interval is practically more profitable and could be implemented under Indian conditions for better wool production.

**Key words:** Angora rabbit, Body weight, Guard hairs, Modulation, Shearing intervals, Staple length, Wool yield

Wool from Angora rabbit is preferred over other wool like Cashmere, mohair and Merino due to its fineness, warmth, fullness, odorless-ness and anti-static property to repel the dirt and used either in pure or blended form for making garments throughout the world. Being about eight times warmer than sheep wool, it is required, for blending with other wool, in a very little quantity. However, quality of the wool mainly fiber/staple length (SL), which should be between 3–6 cm, is an important factor to spin a yarn (pure or blended) and reported to be influenced by various non-genetic factors (Rochambeau and Thebault 1990), feed proteins (Gowda *et al.* 1997), and the shearing interval (Jadrijevic *et al.* 1982). Shearing intervals also found to influence the overall wool production, weight gain, feed

conversion efficiency, semen quality and female fertility in Angora rabbits (Schlout 1994). Economically, decreasing the shearing intervals could increase the profit of Angora farmers. In India, a conventional shearing interval of 75 days has been adopted to get first grade/class wool from the Angora rabbits. As such, there is lack of information on the shearing interval(s) suitable for the Indian conditions and the effect of shearing intervals on the production and wool parameters. This study was, therefore, envisaged to ascertain the shearing interval in Angora rabbits and to assess the effect of shearing intervals on the growth and wool parameters under sub-temperate climatic conditions.

### MATERIAL AND METHODS

An experiment was undertaken on 138 German Angora weaned rabbits of either sex randomly divided into three groups of 46 in each group. All the rabbits were housed individually in standard size iron cages inside the house with asbestos roof and wall made up of chicken wire mesh thereby providing similar housing and management, throughout the

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experimental period. They were offered concentrate in the form of pellet @ 50g d<sup>-1</sup>head<sup>-1</sup> from 42 to 84 days, 80 g d<sup>-1</sup> head<sup>-1</sup> from 85 to 168 days and 140 g d<sup>-1</sup>head<sup>-1</sup> after 168 days of age with a standard scoop in the morning and supplied water *ad libitum*. Additionally, each rabbit was provided *ad libitum* seasonal roughage consisting of tall fescue (*Festuca arundinacea*), rye grass (*Lolium perenne*), white clover (*Trifolium repens*), *Paspalum* spp. and *Setaria* spp. in the wilted form or their hay during winter, in the afternoon, during experimental period. After 1st shearing at 50 days of age, rabbit of groups 1, 2 and 3 were sheared at intervals of 65, 70 and 75 days, respectively from second to seventh shearing. Each rabbit sheared manually with scissors by the same person to avoid the variation in wool yield and quality parameters. After each shearing, the body weight (kg) and wool yield (g) were recorded for individual rabbit. Wool samples from dorsal region were collected for quality evaluation i.e. SL (cm), fiber diameter ( $\mu$ m), medullation (%) and guard hairs (%) using Ermascope (Erma India, Chandigarh). Staple length was measured for each wool sample, whereas wool sample from each clip/shearing for individual rabbit were pooled for estimation of fiber diameter, medullation and guard hairs. The data were analyzed using the analysis of variance (Snedecor and Cochran 1994).

RESULTS AND DISCUSSION

The body weights for different groups after each shearing are presented in the Fig. 1. In all groups, the body weights increased steadily and significantly (P<0.05) from second to clip. However, after sixth clip, the growth was minimal and increased non-significantly in all groups. Garcia *et al.*

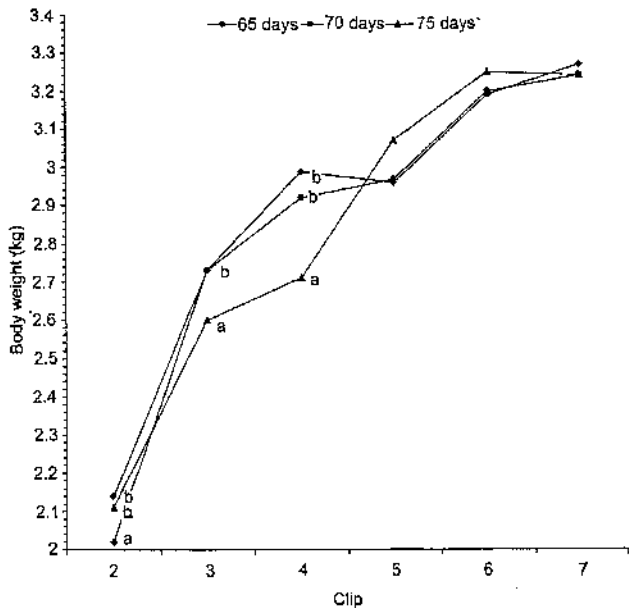


Fig. 1. Body weight of different groups at different clips (different superscripts for a particular clip indicates statistical significance (P<0.05)).

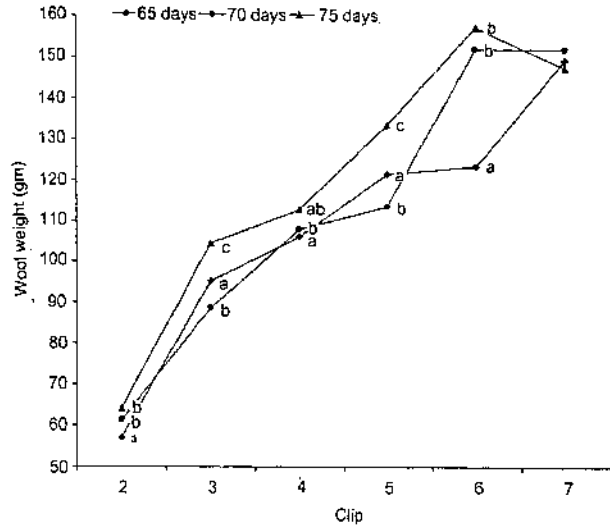


Fig. 2. Wool yield during different chips (different superscripts for a particular clip indicates statistical difference (P<0.05)).

(1993) recorded a gradual increase in body weight of high yielding Angora rabbits until 701 days of age. The group comparison for body weights at different clips/shearing revealed that significant (P<0.05) difference exists among them from second to fourth shearing. After fifth shearing group body weights were not significantly different from each other and at seventh shearing the body weights were almost equal for all three groups indicating that rabbits could have achieved the adult body weights by the time and further little gain would be there. Interestingly, the body-weight of group 1 at seventh shearing was numerically more and had been achieved at an age about 30 and 60 days earlier than group 2 and 3, respectively. Likewise, the group 2 also gained the body weight equal to group 3 about 30 days before at seventh clip. Further, overall average of pooled body weights for each group, from second to seventh shearing (Fig. 4), also had a nonsignificant increase in body weight, while shearing interval decreased from 75 to 65 days. Results, thus, indicate that there was better growth in rabbits sheared at shorter intervals. Similar effect of shorter shearing intervals on better body weight and growth had been reported earlier in Angora rabbits (Schlolut 1994).

The wool yields for each group (Fig. 2) at different clips had an increasing trend from second to seventh shearing. Rachambeau and Thebault (1990) observed rapid increase in the total weight of wool harvested during the first four harvests. Comparison between wool yields of all groups at different clips revealed no definite trend. The yield in-group 3 was significantly (P<0.05) more than group 2 and 1 at different intervals from second to sixth shearing. However, at seventh shearing, the wool yield in all groups was almost equal and non-significantly different from each other and could be related to similar trend in body weights. Similarly, increase in wool production with increase in the body weight and number of shearing have been reported earlier in Angora

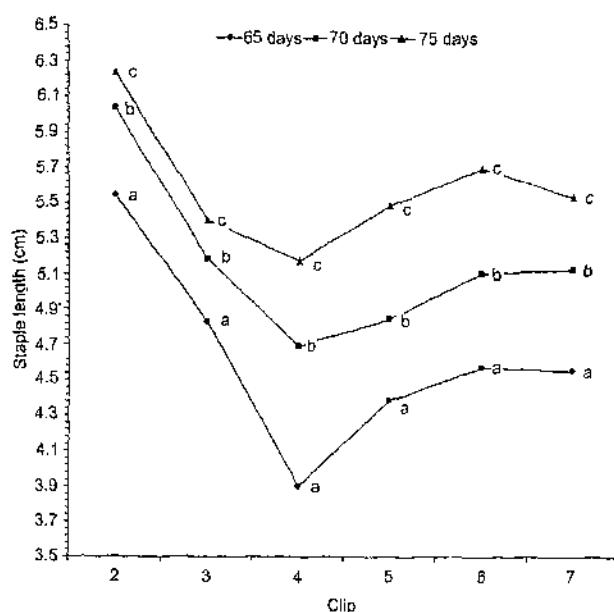


Fig. 3. Staple length(s) for different groups at different clips (different superscripts for a particular clip indicates statistical significance ( $P < 0.05$ )).

rabbits (Eiben and Szabo 1994). Also, wool weight evidenced to increase with increasing body weight (Thebault *et al.* 1992) and the age up to 22 months (Caro *et al.* 1984) in Angora rabbits. The correlation between the body weight and the wool yield for the group 1, 2 and 3 was found highly positive (0.82, 0.83 and 0.80, respectively). Average pooled wool yield for different groups (Fig. 4) indicated that average wool

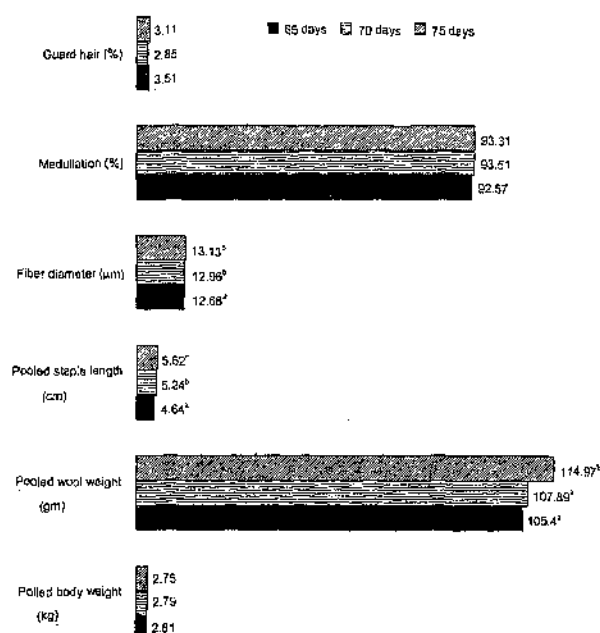


Fig. 4. Pooled growth and wool traits of Angora rabbits (different superscripts for a particular parameter indicates statistical significance ( $P < 0.05$ )).

yield per clip was significantly ( $P < 0.05$ ) more in group 3 than in 1 and 2 while it was numerically more in group 2 than group 1. However, the wool yields in the group 1 and 2 (on individual clip or pooled basis) had been obtained at the lesser age of rabbits than group 3, thereby, significantly reducing the input cost for production of same quantity of wool. Magofke *et al.* 1993 recorded that the total averaged hair yield in Angoras increased with increase in the averaged shearing intervals from 66 to 121 days.

The SL at second shearing in the group 1, 2 and 3 was  $5.54 \pm 0.05$ ,  $6.03 \pm 0.04$  and  $6.23 \pm 0.05$  cms, respectively and was the maximum length recorded for respective group during the experiment (Fig. 3). Shen and Liang (1984) also reported similar fiber length for German Angora rabbits. The SL followed a decreasing trend up to fourth shearing in all groups and then had increasing trend. In Angora rabbits, the maximum staple length had been recorded at 4 months, while minimum at 26 months of age following a 70 days shearing intervals (Caro *et al.* 1984). Further, the decrease in SL during fourth and fifth clips could have been due to relatively hotter (Summer) and hot and humid (rainy) period. Between groups comparison for SL at different clips (Fig. 3) and on pooled basis (Fig. 4) followed a similar trend. On both basis, there was significant ( $P < 0.05$ ) reduction in SL with decrease in shearing interval from 75 days to 65 days. However, the pooled SL at 70 days shearing interval was more than 5 cms (first class fiber) and the daily averaged hair growth was similar to that at 75 days. The average wool yield per clip might be decreased due to more shearing in the short period in 1 and 2 groups from fourth to sixth clip but after that wool yields was almost similar. The daily average hair growth in Angoras recorded to decrease with an increase in shearing interval (Jadrijevic *et al.* 1984). Also, the growth of hairs in Angora is not continuous and varies according to the season in addition to control by the pineal and pituitary glands (Ailain and Russel 1993).

Other wool quality parameters viz. The fiber diameter, medullation, and guard hair, for different groups are presented in the Fig. 4. Significantly ( $P < 0.05$ ) low pooled fiber diameter was recorded in the group 1 than group 2 and 3 while it was numerically more in group 3 than 2 indicating that the fiber diameter increased with an increase in shearing interval. Olmez and Dellal (2002) reported higher fiber diameter ( $16.64 \mu$ ) for German Angora rabbits as compared to our results. There was no significant effect of the shearing intervals on the medullation and guard hairs indicating that the shearing interval did not influence these quality parameters. The fiber diameter and medullation in the present experiment were similar to the reported earlier for pure German Angora rabbits (Herrmann *et al.* 1996). The guard hair contents were not influenced by the shearing intervals in the experiment and their values corroborated for German Angora rabbits under Indian conditions (Srinivasan *et al.* 1995).

It was, therefore, concluded that the shearing at 70 days

interval is possible without any qualitative and quantitative effect on the wool and could be profitable for the Angora farmers as more shearing per rabbit could be obtained during its life. However, more elaborated studies on the larger populations needed to further refine the shearing intervals to assess the impact of such interval on other important parameters under native conditions.

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