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RESULTS AND ASPECTS OF THE ANGORA RABBIT PERFORMANCE TEST IN GERMANY

by

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In spite of the use of synthetic fibres in the production of textiles, the Angora rabbit hair has been able to maintain a good position as a high-grade natural product. The export of Angora rabbit wool from the People's Republic of China alone increased fourfold since 1978 and reached almost 8,000 metric tons in 1983 (Schlolaut, 1988). This development multiplied the demand for German breeding rabbits, which in comparison with other populations exhibit an exceptionally high level of efficiency. This can mainly be attributed to the station tests carried out since 1934. The average annual shearing yield at the station tests rose from 300 to 400 grams in 1934 to over 1,300 grams at present. Excellent achievements even exceeded the 2,000 gram mark. Figure 1 shows the development of the shearing yield with an unaltered trend towards increasing efficiency since 1956. The resulting trend calculation up to the year 2,000 is displayed in Figure 2.

Angora rabbits have been reared in Germany since about 200 years, mostly out of fancy. Tänzer of the Institute of Animal Breeding at the Halle University can be attributed to giving new impulses to Angora rabbit breeding (Tänzer, 1931 and 1932). He prepared the first guiding principles for the performance tests (Tänzer, 1933). Yet, his demand for uniform environmental conditions could not be realized until 1972.

Testing Methodology

On the basis of the diverse handling of tests, the testing period can be divided into 5 phases. Table 1 gives a review of the individual phases of development. As can be seen in the table, the number of test shearings was reduced from four to one. The same holds true for the minimum age - at present, there are no obligatory age limits any more. The procedure for evaluation was all together simplified without reducing the efficiency of the test. There is a correlation of r = 0.77 between the hair yield at an age of 34 weeks and the performance at an age of 164 weeks (Schepens, 1968; Schlolaut & Lange, 1983).

In phase I (1934-1938), the 12-months testing period included four shearings, the sum of which accounted to the annual wool yield. The average annual weight, calculated by means of regular weighing of the rabbit, made it possible to specify the "annual wool yield per kilogram of live weight", thus rendering possible a comparison of the animals which is independent of their weight. The portion of the wool type I and the "wool value" were used as parameters of quality. The wool value resp. wool index, in recent publications termed wool value coefficient, completely charges the grade I (> 6 cm long), but makes substractions for wool grade II (< 6 cm long) and for felt.

The parameters mentioned above were decisive for the calculations in phase II (1938-1957) as well, but more detailed by means of supplements, and with a few changes. Because of a lack of distinct quality requirements on behalf of the wool processing industry, technological parameters were taken into consideration in phases II and III only. During phase III (1958-1971), instead of computing the mean annual wool yield per kilogram live weight, the so-called "wool value end number" was calculated out of the wool value coefficient and the size of the body surface (Niehaus, 1956, 1968). The formula is:

Wool value end number (Wollwertendzahl) = wool value coefficient x 100/body surface in cm^2.

From 1972 in phase IV, the "wool value end number" was not used as weight-correcting index value anymore. The preference of extremely small resp. light-weight rabbits, which in spite of their high hair density exhibit a lower absolute wool yield than heavier ones, impaired the profitableness of Angora rabbit wool production (Schepens, 1968). The calculation of the wool value coefficient has not been a component of the tests during phase V since 1984 (DLG, 1984) because the classification and payment for the wool was not handled uniformly by the textile industrie in dependence on its final utilization. Besides, because of great subjective diversities of the wool grading at the different stations, a comparability of this index figure was not possible (Lange, 1982).

A remarkable progress and increasing efficiency was brought about by the general introduction of the pelleted complete feed with a standardized content of 0.6 to 0.7 % of sulphur containing amino acids (Schlolaut & Lange, 1973; Schlolaut & Lange, 1983). This feed was first presented in Neu-Ulrichstein in 1965. For dietetic reasons, mainly to avoid trichobezoares, the all-mash feed is to some extend supplemented with hay or straw. Since 1982, the transition from outdoor to indoor housing of the rabbits was realized, thus reducing saisonally implied differences in the amount of wool yield. At present, the Angora rabbits are exceptionally kept in flat-deck cages which are equipped with wire or plastic slats. This livestock raising applies to the guiding principles for animal protection of rabbits prepared by the German group of the WRSA (Schley, 1985).

Propositions and Objectives of the Angora Rabbit Performance Tests

In spite of the problems mentioned above regarding subjective point rating and exterior valuation, the station tests can without doubt be largely attributed to the presently high level of Angora rabbit performance. This not only renders possible the genetic improvement, but at least to the same extend the impulses

to the country-wide breeding resulting from the tests. The greatest share of the research in the field of Angora rabbit production in Germany is based on data from the station tests or else was motivated by them.

In view of the positive experiences and the attained efficiency level, Angora rabbit performance tests (ARET), besides the estimation of the breeding value, have the following functions:

1. Establishing of an objective control basis for the performance level of various strains;
2. Analysis of Angora rabbit populations;
3. Motivation for the realization of research for further development of the test methodology and of the genetic foundations of breeding as well as management in general;
4. Informations about sources of supply of exceptionally efficient breeding stock.

The efficiency increases achieved so far are mostly based on a multiplication of woolly hair follicles (Koetter & Mehner, 1965) which are expedited by optimum nutrition. The correlation between annual wool yield and hair thickness is +0.88. High shearing yields, on the other hand, may not be considered in an isolated sense. In comparison to normal-hair rabbits, Angora rabbits are now exhibiting a fertility rate that is as much as 50 % lower. This is an obvious antagonism of traits, resulting from preferential use of animals with high shearing yields, and intensifying by incest effects.

Conclusions

In the evaluation of the performance increase since the establishment of the station tests in Germany more than 50 years ago, it is obvious that a number of problems still need to be solved.

The following measures are considered most important:

1. The correction of the breeding standards in such a way that the exterior characteristics of Angora rabbits, such as hair appendage at head, ears, and feet, should be limited to a race-typical mark. There may be no preference of negative performance carriers with too much hair at the extremities.

2. A special strain of animals with a high share of multiple medullated hair (Kemps) should be established.

3. The including of fertility parameters within the frame of the test seems to be necessary, so as to avoid a counter selection of fertility disorders on the basis of the antagonism of features between the shearing yield and fertility parameters.

4. Better utilization of exceptionally well performing male rabbits by means of artificial insemination. Besides, the use of such an exceptional buck in several flocks would improve the accuracy of breeding value estimations.

5. The subjective judgements of breeding animals should be substituted by objective testing methods, if possible. This applies especially to the determination of hair length and the proportion of multiple medullated hair (Kemps). A selection index, enabling the selection in regard to heredity and economic value of the different performance parameters, would be desirable.

6. The present use of the absolute result figures of station and field tests for the comparison of breeding values is misleading. The consideration of performance deviations at the selection is only permissible with the relative figures of the contemporary comparison at the same test conditions.

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Summary:

Since 1934 Angora-Rabbit performance tests in Germany are excecuted. The registrated performances of these tests are an objective documentation if the more than threefold increase of the hairyield in 5 decades. Furthermore they produced the suppositions of genetic progress in the German Angora Rabbit Population and motivied research work in nutrition and management of this breed.

Since 1956 the trend of performance increase has not changed. In the average a yearly improvement of the hairyield about of 14 g at the males and 17 g at the females was obtained. Top performances yielded more than 500 g of hairs per shearing. This means more than 2 kg per year. The problem is the existance of a genetic antagonism between a high hairyield and reproduction. Therefore it is necessary to select on reproduction simultanously. Further proposals to improve the efficiency of the Angora Rabbit breeding are made.

Zusammenfassung:

Seit 1934 werden in Deutschland Stationsprüfungen für Angorakaninchen durchgeführt. Die in diesen Prüfungen erzielten Leistungen dokumentieren eine Verdreifachung des Schurertrages innerhalb von fünf Jahrzehnten. Da die Zuchtbetriebe nur eine geringe Bestandesgröße aufweisen, ermöglichten die Prüfungen Selektionsentscheidungen anhand von objektiven Leistungsvergleichen zwischen Stallgefährten. Ferner motivierten sie die Durchführung von Forschungsarbeiten auf den Gebieten der Fütterung und der Produktionstechnik.

Seit 1956 ist der Trend der Leistungssteigerung nahezu unverändert. Er entspricht im Durchschnitt jährlichen Steigerungsraten von etwa 14 g bei den männlichen und 17 g bei den weiblichen Kaninchen. Spitzenleistungen haben Schurerträge von 500 g überschritten. Das entspricht Jahresleistungen von über 2 kg. Es besteht jedoch ein Merkmalsantagonismus zwischen dem Haarertrag und der Reproduktionsleistung. Die Berücksichtigung der Fruchtbarkeit bei der Selektion ist daher erforderlich. Weitere Vorschläge für die Verbesserung der Effizienz der Angorakaninchenzucht werden gemacht.

Sources

1. DLG (1984):
Richtlinien der Deutschen Landwirtschafts-Gesellschaft (DLG) für die Durchführung von Stationsprüfungen auf Wolleistung beim Angorakaninchen (ALP).
DLG-Information 3/1984

2. Koetter, U., Mehner, A. (1965):
Dichte und Gruppierung der Haarfollikel in der Haut des Angorakaninchens.
Kleintierzucht in Forschung und Lehre 14, Celler Jahrbuch 1965, 36

3. Koetter, U. (1967):
Wollertrag, Wollqualität und Vliesbildung beim Angorakaninchen.
Züchtungskunde 39, 56 - 66

4. Lange, K. (1982):
Kritische Betrachtungen zur Wollwert-Richtzahl (WRZ) als Selektionskriterium für Angorakaninchen.
Deutscher Kleintierzüchter 92, 5

5. Niehaus, H. (1956):
Vorschläge zur Bewertung von Angorakaninchen.
Kleintierzucht in Forschung und Lehre 5, Celler Jahrbuch 1956, 144 - 149

6. Niehaus, H. (1968):
Angora-Leistungsprüfungen und Wollwert-Endzahl.
Deutscher Kleintierzüchter, Gemischte Ausgabe 77, 2, 4 - 5

7. Prüfungsberichte der Prüfungsanstalten Celle, Halle, Hamm, Kitzingen, Futterkamp, Krefeld-Großhüttenhof, Kiel-Steenbek, Neumühle, Neu-Ulrichstein, Stuttgart-Hohenheim, Unna.

8. Schepens, K. (1968):
Kritische Betrachtungen zur Angoraleistungsprüfung.
Diss. Göttingen

9. Schley, P. (1935):
Kaninchen.
Verlag Eugen Ulmer, Stuttgart

10. Schlolaut, W., Lange, K. (1973):
Der Einfluß von Methionin auf die Mastleistung und den Wollertrag von Kaninchen.
Archiv f. Geflügelkunde 37, 208 - 212

11. Schlolaut, W., Lange, K. (1983):
Untersuchungen über die Beeinflussung quantitativer Merkmale der Wolleistung beim Angorakaninchen durch Geschlecht, Alter, Fütterungstechnik und Methioningehalt des Futters.
Züchtungskunde 55, 69 - 84

12. Schlolaut, W. (1987):
Angorakaninchen: Haarertrag und -qualität.
DGS 38, 1150 - 1155

13. Tänzer, E. (1931):
Das Angorahaar und seine mechanischen Eigenschaften.
Zeitschrift für Pelztier- und Rauchwarenkunde 3, 104 - 113

14. Tänzer, E. (1932):
Leistungszucht beim Angorakaninchen.
Der Kaninchenzüchter, Verlag Poppe, Leipzig, Jg. 38, Nr. 6

15. Tänzer, E. (1933):
Die Leistungsprüfung in der Angorakaninchenzucht
Der Kaninchenzüchter, Verlag Poppe, Leipzig, Jg. 39, Nr. 14

Table 1: Review of the changing test methods for Angora rabbit station tests in Germany since 1934

Phase	I	II	III	IV	V
Period	1934-1938	1939-1957	1958-1971	1972-1983	from 1984
Duration of test	12 months	12 months (in Celle from 1952: 9 months)	9 months	5 months	3 months
Number of test shearings	4	4 (3)	3	1	1
Minimum age at delivery	8 months	6 months	4(3) months	-	-
Maximum age at delivery	-	6 months (from 1952)	8 months	10 weeks	10 weeks
Composition of test groups	4 animals per breeder	single an. and anim. of 1 litter	3 animals of one litter	2 animals of same sex and litter	
Reference figures	Annual wool yield/ Annual wool yield per kilogram of live-weight	Annual wool yield/ Annual wool yield per kilogram of live-weight	Annual wool yield/ "Wool value end number"	Annual wool yield/ Feed conversion per 100 g of Wool value coefficient	Annual wool yield/ Feed conversion per 1000 g of wool
	Share of premium quality of annual wool yield	-	Share of different quality grades	Percentage and absolute share of quality grades	Percentage of quality grades
	Wool value	Wool value	Wool value coefficiant	Wool value coefficiant	-
	Average annual weight	Average annual weight	Average annual weight	Average weight at 3 weighings	Weight at end of test
	-	Different technological data (tensile strength, thickness a. density of hair, capacity of thermal storage)		Absol. and rel. deviation of ann. wool yield and feed consumption per kg of wool, comp. to av. of stable mates	
Feeding	Combined	Combined	Combined	Pelleted all-mash	Pelleted all-mash
Housing	Outdoor	Outdoor	Outdoor	Indoor	Indoor

Figure 1: Results of the Angora rabbit performance tests in Germany from 1934 to 1986

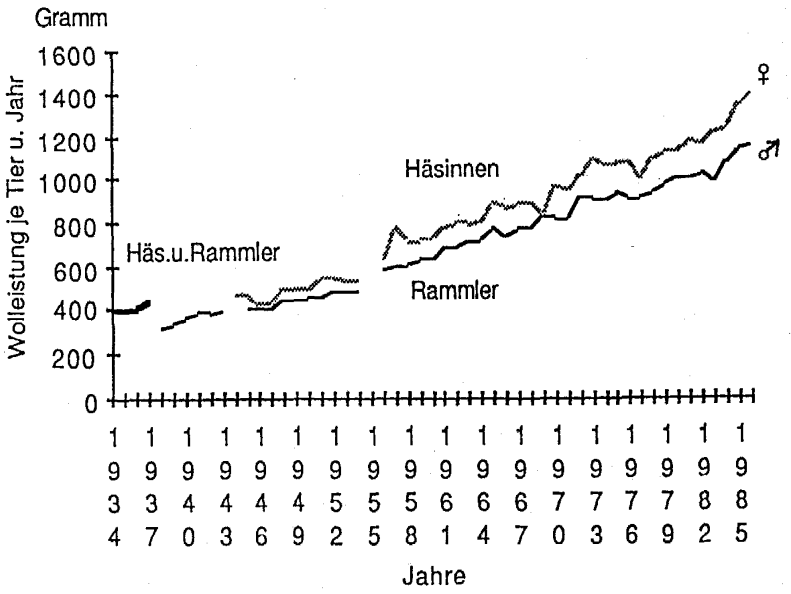

Figure 2: Trend estimation of the hair yield increase of Angora does until the year 2000