The effect of temperature, season and heredity on wool production of German angora rabbits in Finland

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INTRODUCTION

In Finland, winters are long and cold, springs and autumns are windy and humid and summers are warm and nice but short. That is why we are experts to survive in changing environmental conditions and we know the great value of good insulation in fabrics. We have had sheep and fur animals in Finland, but angora rabbits were unknown as wool producers. They had been mainly pets.

Because of these reasons we started the Angora project in 1987 in Finland. We also wanted to have a new producer in our traditional cow farms because of the great change in our agriculture policy in 1980's. From the literature we knew that the environmental temperature is the most important thing affecting wool production in angora rabbits (Gekle et al. 1985, Kockova & Jansky 1968, Tzschentke et al. 1990). In farm conditions environmental temperature is closely related to season. I had picked up several parameters which may affect wool production, for instance: wool length and difficulties in thermoregulation, temperature, food, heredity, sex, age. The problem was how to put these in practice and how to use them as a criteria in breeding animal selection.

MATERIALS AND METHODS

Our breeding animals came from Dr. Erich Zimmermanns farm from German in march 1987. They were divided into two research farms in Finland. We tested different kind of food compositions, cage types, temperature and shearing interval during years 1987-1989.

At the same time we run also laboratory experiments. In this population there were no statistical difference between sexes in wool production but there were huge individual differences. Wool production began to decrease also with age so, that in males it happened earlier than in females.

Wool production is concerning voluntary temperature tolerance of angoras when the hair length is changing. For that we made a temperature gradient plate. On the surface there was an almost linear temperature gradient and the system was in a climatic chamber and all information

was recorded outside of the chamber. We tested adult animals in different environmental temperatures and in different hair lengths. Pups were tested from birth up to the age when they were hair covered and their eyes were open.

The data from farm experiments was tested SPSS / PC program by MCA-analysis.

RESULTS

In research farm environmental temperature had an significant effect on wool production, but it came mainly by wood consumption. In cold seasons and after sharing animals ate more and in summer and in long haired they ate less.

Larger animals produced more wool compared to smaller animals, but the relative wool production began to decrease if animals were heavier than 4,2 kg.

Wool production is highly heritable. The effect of males is greater than the effect of females because of the mating system. Length of shearing interval influences wool quantity and also wool quality. In laboratory l quality.

In laboratory experiments adult angoras did not react to slight temperature changes on the bottom surface, but the pups were very temperature sensitive during the first three days of their life and could keep their body temperature constant after 7 days of age.

CONCLUSIONS

In research farm the selection of breeding animals gave the best result to improve the wool production. We have to remember that the research animals were from a research farm where they had been selected for generations. Most of the angoras in Finland are so called Scandinavian type which genetic background is unknown and very heterogeneous. This gives us enormous opportunities for genetic selection. Environmental temperature and food composition were statistically significant but in real life they are far away from the effect of heredity (Nurminen 1990) . Of course we assume that the temperature changes are not the same as outside of the farm and the animals are fed normally every day. Animals seem to acclimatise to the seasonal temperature changes by eating more or less but the shearing is an unexpected temperature change to animals (Jansky et al. 1984, Nagasaka 1974, Nurminen 1990). So, the effect of temperature comes in practise by he effect of temperature comes in practise by the food consumption but after shearing animals do need higher temperatures during the cold seasons (Nurminen 1990, Vermorel 1988) .

There are great individual differences in wool growth and the length of the shearing interval influences both the wool length and wool quantity. In small farms, like we have in Finland, it is possible to use individual shearing control. When the wool grows longer the growth rate of it decreases and wool may also tangle. To get more wool it is necessary to grade the wool according to the utilisation purpose of it.

In short laboratory tests we noticed that the voluntary temperature tolerance of angoras was bigger than generally assumed in literature (Hull & Hull 1982, Hull et al. 1986, Jansky 1984, Nurminen 1990, Tzschentke et al. 1990, Vermorel 1988) but in practise, it is not possible to have these kind of temperature changes because of moisture problems, higher food consumption and the changes may also stress the animal.

The result of my research was very releasing to angora farmers. The effect of food composition and food consumption on wool production was much more smaller than the effect of heredity in this population (Nurminen 1990). Angoras can also stand and gradually acclimatise to temperature changes in farms. Nowadays in Finnish angora breeds organised breeding animal selection gives good results in wool production earlier and by a cheaper way than the improvement of food composition or controlled environmental temperature.

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