Proceedings 5th World Rabbit Congress, 25-30 July 1992, Corvallis – USA, 1646-1650.

The Effect of Rare Earths on the Quality and Output of Rabbit Wool

Tao Yuerong Lin Jia Zheng Jun
(Zhejiang Agricultural University, Hangzhou, China)

Abstract

72 Angora rabbits were employed in the experiment and classified as 4 groups. The diets of group II, III and IV were added with 0.01%, 0.03% and 0.05% rare earth elements and group I remained as control. The results of the experiment showed that addition of rare earths could improve wool quality and increase the output of high quality wool by 51.45% (III) and 43.44% (IV), compared with the control group. The difference was significant ($p<0.05$). The total wool yield of the group II, III and IV was increased by 2.49%, 8.59% and 9.04% than that of the control group.

Key words : Angora; rabbit; rare earths; wool yield

Abound in resources, China occupy first place in the rare-earth reserve in the world and has a yearly output of more than 10,000 ton. The utilization of rare-earths was formerly restricted to industries such as oil, metallurgy, ceramics, textiles, etc. In recent years, however the application of rare-earth elements to agricultural production has made encouraging achie-

Proceedings 5th World Rabbit Congress, 25-30 July 1992, Corvallis – USA, 1646-1650.

vements. Yet, its application to animal husbandry still remains in experimental stage. Modern animal nutriology reveals that the various kinds of enzymes and hormone which take part in the animal nutritious metabolization may have certain components of rare-earth elements that activate or restrain enzymes. Luck of certain elements in animals may result in hinderance in growth, incompleteness of the cuticularization of fur and unsatisfaction in sheen. This study aims at approaches to the effect on the quality and output of rabbit wool by adding different dosages of organic rare-earths to the basic diets.

Material and Method

Choose 72 healthy first generation Angora rabbits of German and Local hybridization, and classify them equally into 4 groups according to sex, age, weight and wool yield. Take group I for control, only feed them with basic diets(pellets). Take other three groups for experiment. Add 0.01% (group II), 0.03% (group III) and 0.05% (group IV) mixed organic rare-earths respectively to the basic diet. Basic diet is as follows: bean cake 20%, wheat bran 20%, rice bran 20%, rice straw meal 40%, salt 0.5%. Besides, add to every 100 kg mixture feed $MnSO_4$, $CuSO_4$, $ZnSO_4$, multivitamin 10 g. The nutritions components are crude protein 15.43%, coarse fiber 16.62%, metabolization energy 2.1 m. cal/kg. Mixed organic rare-earths components are La 40%, Ce 40%, Nd 15%, Pr.Sm 5%. Keep experiment rabbits in single coop, feed them every morning and evening and let them drink freely. Pretest period is 6 days.

Proceedings 5th World Rabbit Congress, 25-30 July 1992, Corvallis – USA, 1646-1650.

After pretest, shear all the rabbits and measure separately the weight of wool and rabbit. Testing period 75 days. After the experiment, shear and weigh the rabbits one by one and also grade the wool.

Results and Discussion

The effect of rare-earths on the quality of the wool. According to Angora rabbit wool grading standard of China, super grade and 1st grade wool are rather close and the wool yield is comparatively small. In order to reduce errors, we combined the super and 1st grades into one, and call it 'High Quality'. The grading result of the respective group is as follows, Table 1.

Table 1. Grading rate of separate group unit: %

group	High Quality	II	III	substandard
I	12.11	39.17	26.24	22.48
II	8.17	44.17	25.57	22.09
III	18.34	39.87	18.90	22.89
IV	17.37	38.22	22.93	21.47

Except group II, which has a deeline in High Quality rare because of poor management, group III and IV both increased by 51.45% and 43.40% respectively, as compared to the control group (groupI). The difference is significant ($p<0.05$). There's no obvious difference in substandard grade among each group. Therefore, an addition of 0.03-0.05% rare earths in

daily diet may increase the rate of high quality wool. The rate of soft wool is another criterion for judging the quality of the wool, the more felting wool less the rate of soft wool. The rate of soft wool of respective group is: group I 94.08%, group II 95.85%, group III 93.03% and IV 92.01%. It is quite Clear that no obvious difference occurs here, therefore, the rate of soft wool is decided by genetic and management factors.

The effect of rare earths on the wool yield and yielding rate. The statistics of the wool yield and yielding rate of each group, Table II.

Table II. Wool yield and yielding rate of each group

group	wool yield (g/per rabbit)	average weight (kg/per rabbit)	yielding rate (%)
I	109.26±23.2	3.02	3.61
II	111.47±27.0	2.99	3.70
III	110.83±21.5	2.83	3.92
IV	113.24±23.0	2.87	3.94

The wool yield of experimental groups as compared to the reference group has an increase in different degrees, but the difference is not very notable. There's a remarkable increase in the yielding rate of group III and IV in comparison with the control group, by 8.59% and 9.14% respectively ($p<0.05$), however, group II has only an increase by 2.49%. The author thinks that owing to the addition of rare earths to the diet, apart from maintaining the life activities, wool rabbits are

the surplus nourishment to yield wool. Results also show that, adding rare earths to the diet does not accelerate the growth of the rabbits, on the contrary, as the amonunt of the addition increases, the weight of the rabbit decreases. Investization shows that the likely reasons may be as foolows: 1) Certain rare-earth elements activated or restrained the various enzymes and hormones in the process of metabolization, thus accelerates the wool yielding. 2) Rabbits need an adaptation course to the adding of rare earths in diet and have certain limit in endurance. In the early part of the experiment, the appetite of the rabbits in experimental groups generally decreased, while the drainage of soft dung increased, however, in the middle of the experiment period, the situation took a favorable turn. With the increase of the anount of rare earths, the soft dung increased correspondingly, especially in group IV. This proved the limit of wool rabbits to the rare earths. 3) When the experment began, there was a rapid decline in temperature cloudy and drizzly for days on end, alimentary canal disease occurde in quite a few rabbits, growth was affected to certain extent.