

STUDY OF THE DIETARY ENERGY AND PROTEIN LEVELS FOR REPRODUCING REX RABBITS

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ABSTRACT

In the present experiment to study nutrition requirements of energy and crude protein of the reproducing rex rabbit, four groups were designed as the following, high energy high protein group 1 of 11.31MJ DE /Kg and 18.73% CP, low energy high protein group 2 of 10.71MJ DE /Kg and 19.54% CP; high energy medium protein group 3 of 13.1MJ DE Kg and 17.02% CP, and low energy medium protein group 4 of 10.47MJ DE /Kg and 17.48% CP. The results of 127 litters show that, pregnant rabbits on group 4 got the highest litter size, the survival rate and initial litter weight. And when the diet for the lactating does is on 10.71MJ DE/Kg, 19.54% and crude fiber12.52%, it is favorable to improve litter size and litter weight at weaning at 35 d.

Key words: Rex rabbit, dietary energy and protein, pregnant rabbit.

INTRODUCTION

Feed nutrition is of the first important material basis for domestic rabbit farming. It is the key to make the best of rabbit's production ability and has direct relationship to income of the rabbit keeper. In recent years lots of researches have been focused on nutrition requirement for meat-purpose and Angora rabbits and remarkable achievement has been got. Klaus (Germany, 1995) and Shiming Liu (China 1994) have given their feeding standards for Angora rabbit (REN K.L *et al.* 2002). Those standards have played important role in meat and Angora rabbit production. However systematic approaches to nutrition requirement for fur purpose rabbit are rather limited and it is high necessary to supply the lack. At this situation though standards fir meat and angular rabbit are taken as reference in fur-purpose rabbit production, it is far to meet the quality and efficiency goals. Present study on brood Rex rabbit is one of the sub-topics in the program of "Approaches to standard of fur rabbit nutrition and its compound feed", and try to define the adequate DE/DP rate in reproductive rabbit does.

MATERIALS AND METHODS

Animals

Present study was conducted in the Experimental Rabbit Farm of the Institute of Animal husbandry and Veterinary Science, Shanxi Academy of Agricultural Sciences. Rex rabbits in favorable body condition of near litter were applied in the experiment

Diets

The feed applied in the experiment is formation of corn, wheat bar, bean meal, alfalfa meal, peanut shell meal and calcium monophosphate, salt and trace elements. The nutrition values for all feed stuff material were tested and 4 groups were divided according to levels of energy and protein as high energy high protein, low energy high protein, high energy medium protein and low energy medium. The nutrition levels of these diets are shown in Table 1.

Table 1. Chemical composition of the experimental feeds.

Nutrition level	group 1	group 2	group 3	group 4
Digestible energy (MJ/Kg)	11.31	10.71	11.31	10.47
Crude protein (%)	18.73	19.54	17.02	17.48
Crude fiber (%)	13.63	12.5	13.83	14.62
Crude fat (%)	1.96	1.96	2.11	2.00
Calcium (%)	1.08	1.08	1.10	1.09
Phosphorous (%)	0.62	1.28	0.97	1.16
Lysine (%)	1.11	1.03	0.94	0.90
Phosphorous amino acid (%)	0.79	0.87	0.73	0.83

Note: Except for values of digestible energy and amino acid, all the rest values were actual tested values

Experimental procedure

The applied does were random divided into 4 groups. Provided the avoidance of inbred, the experimental does random mated with the chosen males. During the experiment

period from the pregnancy to suckling the same diet was supplied with no any changes until weaning. The breeding service was done after weaning. During the experiment the following items were measured: litter size, number of pups born alive, initial litter weight, milking capability, litter weight at 35 d. and survival rate at weaning.

For all the experimental groups the condition was kept at the same level. The experiment rabbit were kept individually in separate cages of 0.42m², regulate time interval and feed supply about 170g without fresh forage and *ad libitum* water. For the sucking rabbits they could be adjusted inside group and the adjustment between groups was forbidden. The youth were separated from the does at the 21st day. The youth were supplementary fed with equal quantity and quality levels.

RESULTS AND DISCUSSION

Table 2 shows that the number born and alive number born of the low energy groups 2 and 4 of (10.47 to 10.71MJ DE/Kg) were higher than those of high energy groups of 1 and 3 (11.31MJ DE /KG. That could means that, low energy high protein group 2 is 7.8% and 8.2% higher than high energy high protein group 1 and high energy medium protein group 3 respectively. And group 4 is 15.6% and 21.3% higher than groups of 1 and 3. In two low energy groups, the group 4 with medium protein has bigger litter size, alive litter size and higher initial litter weight. The litter size of group 3 ranks the last and the still birth of group 1 with the top protein level. The litter weight showed a positive relationship with litter size. It suggests that in low energy groups of brood Rex rabbit no matter the protein levels is of high or medium, it is favorable to litter size, survival rate and the initial litter weight. But when crude protein was at 17.48%, it got the highest litter size, survival rate and initial litter weight. Diet with high energy level showed a negative effect to litter size, alive new born and initial litter weight which is consistent with the conclusions (TANG L. M *et al.* 1994, GAO Z.H *et al.* 2001).

Table 2. Effects of energy and protein to reproductive performance of does after suckling.

group	n	Total litter size	Alive litter size	Still birth (%)	Initial weight (g)	Milk yield (g)	Litter weight at 35d. (g)	Litter size at weaning	Survival rate (%)
1	33	6.4±2.4	6.1±2.4	4.7	388.0±113.1	1491±399	3229±1023	4.3±1.3	70.4
2	32	6.9±1.8	6.6±1.8	4.1	414.5±102.1	1615±381	3401±1030	4.9±1.4	71.4
3	33	6.1±2.2	5.8±2.3	3.5	386.2±106.7	1632±455	3304±938	4.6±1.4	76.1
4	29	7.4±1.9	7.2±2.0	3.3	436.9±103.9	1547±436	3327±828	4.7±1.4	63.3

Table 2 also show that the litter weight and litter size at weaning of the low energy high

protein group 2, with digestible energy 10.71MJ/KG and crude protein 19.54%, is higher than the rest groups; the litter size at weaning of the low energy medium protein group 4, with digestible energy 10.41MJ/KG and crude protein 17.48%, is higher than in the other high energy groups, but its survival rate at weaning is lower than the rest groups. It suggests that high crude protein level is important in the diet for the suckling rabbit to get more and better quality milk to meet the needs for fast growth of the youth.

CONCLUSIONS

The results of the present experiment showed that, for pregnant rabbit in fine body conditions, it is recommended to wean at the 35th day. While under limited conditions, it recommended to take diets of nutrition level of digestible energy 10.47MJ/KG, Crude protein 17.48% and crude fiber 14.62% which is favorable to improve litter size, alive new born and the initial litter weight. As far as suckling Rex rabbit is concerned, a diet with digestible energy of 10.71MJ/KG, crude protein of 19.54% and crude fiber of 12.52% is favorable to improve litter size and weight at weaning.

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