Effect of Different Rearing Methods on the Weight of Rabbits

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SUMMARY

The aim of the experiment was to study the effect of the nutrient supply at foetal, suckling and growing age on the body weight of rabbits. 242 new-born rabbits were divided into three groups on the basis of their birth weight (Low = 34-45 g, Medium = 53-58 g, High = 65-70 g). One half of the litters were nursed by one doe, while the other half by two does. After weaning at 21 days of age, half of the rabbits were fed ad libitum, while the other half were fed restricted (ca. 85-90% of the ad lib.). All of the 12 groups were divided into two subgroups randomly: first artificial insemination (AI) at 15.5 or 18.5 weeks of age.

All of the studied factors had significant effects on the body weight of rabbits. At four weeks of age the influence of birth weight was the highest (L: 0.51, H: 0.67 kg, $P<0.05$). A significant difference was found between the groups nursed by one or two does (0.52 and 0.64 kg). At nine weeks of age the effect of all factors were similar. At 15 weeks of age the following differences were found: L: 3.03, H: 3.37 kg, one or two does: 3.11 and 3.26 kg, rest. and ad lib.: 3.00 and 3.37 kg, respectively. The highest difference was found between the group of low birth weight, nursed by one doe and fed restricted (2.75 kg) and that of high birth weight, nursed by two does and fed ad libitum (3.81 kg).

KEY WORDS

rabbits, birth weight, nursing, feeding, body weight

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INTRODUCTION

The maternal effect – a close connection between doe and her offspring – has a special importance in rabbit breeding. Surviving and growing of foetuses and suckling kits depends on the ability of their mother and this effect can also be shown in the later fattening period and sometimes also in the production of does. The birth weight is connected with the blood (nutrient) supply of foetuses, the weight of suckling rabbits depends on their milk intake and the weight gain of kits after weaning is associated with their feed consumption.

Some authors have studied the maternal effect and the effect of housing and feeding methods during the rearing period (Rommers et al., 1999; Szendrő and Maertens, 2001; Szendrő et al., 2001a,b), but the effect of birth weight, milk supply and feeding scheme on body weight of suckling and growing rabbits has not yet been investigated together.

Therefore, the aim of this experiment was to study the separated and the common effects of nutrient supply at foetal, suckling and growing age on the body weight of rabbits. This paper is the first part of the experiment examining these effects on productive and reproductive traits.

MATERIALS AND METHODS

The experiments were carried out on the rabbit farm of the University of Kaposvár on Pannon White rabbits. The new-born rabbits (n=242) were divided into three groups on the basis of their birth weight before suckling on the day after birth (low = 34-45 g, medium = 53-58 g, high = 65-70 g). Thus, eight kits were put into each new formed litter.

All of the three groups - created on the basis of birth weight – were randomly divided into two subgroups in a manner that a half of the litters were nursed by one doe and the other half by two does using the method published by Gyarmati et al. (2000) and Szendrő et al. (2002). In this group the kits were nursed by two does kindled at the same day. One of the mothers was admitted to the nest box for nursing in the morning, while the second was admitted in the evening. On the 17th day after kindling, the door of the nest box was opened and the kits could move freely. From this day kits were only nursed by their own mothers. In case of traditional nursing (by one doe) does nursed their young only in the morning. The experimental design is shown in Fig 1.

The kits were weaned at 21 days of age. All of the six groups were randomly divided into two subgroups again: one subgroup was fed ad libitum and the other subgroup was fed with restricted diet (10.3 MJ/kg DE, 16% crude protein, 15,5% crude fibre). Rabbits of the restricted group were fed ad libitum between 3 and 4 weeks of age, then they were allowed to eat for 10 hours a day between 4 and 6 weeks of age, 9 hours a day between 6 and 9 weeks of age, 8 hours a day between 9 and 12 weeks of age, 7 hours a day between 12 and 15 weeks of age. With this feeding scheme the feed intake of rabbits in the restricted group was about 85-90% comparing to the ad libitum group

Body weight of growing rabbits was weighed weekly from three weeks to 18 weeks of age.

Experimental data were evaluated by multi-factorial analysis of variance using SPSS 9.0 for Windows. The examined factors were the birth weight (low, medium, high), the milk supply (kits nursed by one or two does), and the feeding scheme (ad libitum or restricted feeding).

RESULTS AND DISCUSSION

Significant differences in body weight were found between groups with different birth weight at the age of 3, 6, 9, 12, 15 and 18 weeks (Fig 2). Average difference in body weight between groups of low and high birth weight increased from 0.13 to 0.35 kg between the age of 3 and 15 weeks. Similar results were reported by Szendrő et al. (2001a).

The group nursed by two does had higher body weight through the total experimental period compared to the group with only one doe (at 3, 6, 9, 12, 15 and 18 weeks of age: 0.12, 0.16, 0.18, 0.18, 0.15 and 0.12 kg, respectively, Fig 3). Similar results were found by Gyarmati et al. (2000) and Szendrő et al. (2001a). At 6, 9, 12, 15 and 18 weeks of age the differences in body weight between the groups fed ad libitum and restricted was significant (0.1, 0.12, 0.28, 0.38, and 0.46 kg, respectively). The differences increased with age. (Fig 4). On the basis of our results it was established that the influence of the 85-90% feed restriction applied was higher than that of birth weight and number of nursing does.

Comparing the most disadvantageous (low birth weight, nursing by one doe, restricted feeding) and the most advantageous groups (high birth weight, nursing by two does, ad libitum feeding) the differences are summarised (Fig 5), therefore the differences between these two groups are the most remarkable (0.28, 0.55, 0.70, 0.85, 1.06 and 1.14kg at 4, 6, 9, 12, 15 and 18 weeks of age, respectively).

No significant interaction was found between the factors examined.

CONCLUSIONS

All studied factors (birth weight, nursing by one or two does, ad libitum or restricted feeding) had significant influences on body weight of rabbits

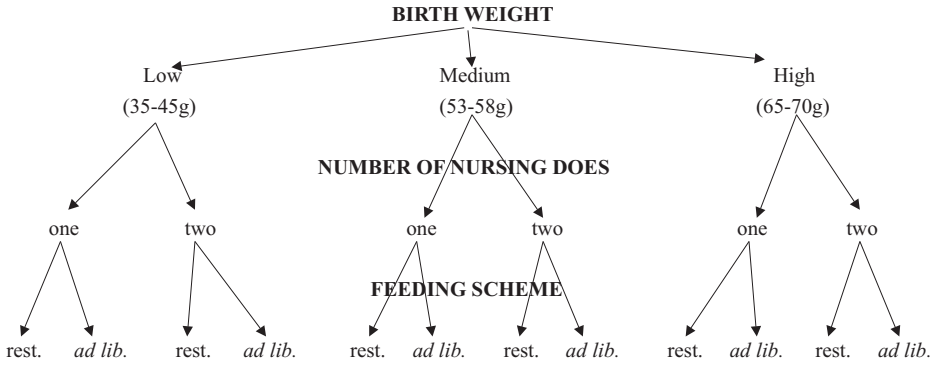

Figure 1. Experimental design

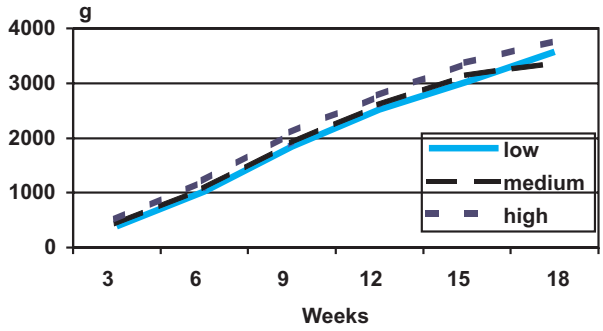

Figure 2.
Effect of birth weight on body weight of growing rabbits
Remark: The effect of birth weight is significant at $^{x}p<0.05$ or $^{xxx}p<0.001$ level

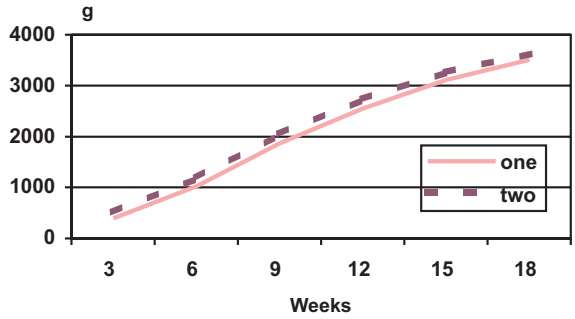

Figure 3.
Effect of number of nursing does on body weight of growing rabbits. Remark: The effect of nursing method is significant at $p<0.001$ level

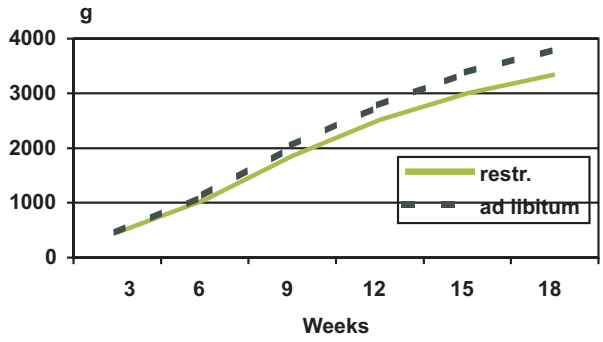

Figure 4.
Effect of feeding scheme on body weight of growing rabbits
Remark: The effect of feeding scheme is significant at $p<0.001$ level.

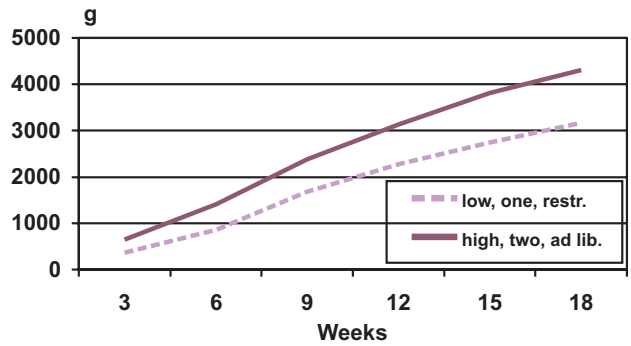

Figure 5.
Effect of all the studied factors on body weight of growing rabbits. Growth of the most advantageous and the most disadvantageous groups

until the age of 15 or 18 weeks. The feeding scheme (restriction of 85-90% of the ad libitum level) had the strongest effect. The nutrient supply of the suckling rabbits or that of the foetuses had a long effect on body weight. There was not compensation in any case. Our results call attention to the importance of the nutrient supply at the foetal and suckling ages on the growth of rabbits.

The long term aim of our experiment is to examine the reproductive traits of does to find the best rearing method of female rabbits. It seems that the experimental design and development of the body give a fair chance of success.

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