Growth intensity of young rabbits on the background of use of complete mixed fodders

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Abstract. The development of each individual is influenced by many factors: from genetic to environmental conditions. Therefore, the goal of our research was to establish the characteristics of the growth rate of rabbits from birth to sale when using complete feed in a controlled microclimate. Research was carried out on complex crossbreeds in the rabbit breeding laboratory of the Belgorod State Agrarian University. At birth, the average live weight is 53±2 g. In the first three days, the rabbits were fed colostrum and their average daily gain was 8±1 g, when switching to milk in the next 4 days it increased to 13±1 g, and in the next week - 19±2 g. In the third week of life, the rabbits were introduced to the feed; during this period, the average daily gain did not increase significantly and amounted to 21±3 g. From the next week, the feed began to prevail in the diet of the young animals, and their average daily gain increased to 39±4 g, and the live weight reached 796±43 g. Starting from the 30th day, the rabbits were exposed to stress factors such as branding and weaning. At the same time, the average daily increase in live weight continued to increase, reaching a maximum in the interval between 50 and 60 days with values of 40-42 g, regardless of the method of preventing eimeriosis. It is worth noting that live weight when using a coccidiostat based on essential oils (Ent-Oil Eimecon Dry) is higher than when using a broad-spectrum antibiotic effective against eimeria (Cycocin) and amounted to 3078±38 and 3305±62 g, respectively (p < 0.01).

1 Introduction

Rabbits, as a biological species, have a significant genetic potential for active live weight gain. However, full realization of the genome is only possible with an optimal combination of external abiotic and biotic factors. The cornerstone that ensures growth intensity is a balanced feeding. Thus, the amount of fiber determines the motility of the digestive tract, and as a consequence, the speed of evacuation of feed masses from the stomach. At low fiber content in young animals often have diarrhea, and at too high - the rabbit quickly begins to feel satiety, which leads to a decrease in energy intake necessary for growth. The optimal amount of fiber ranges from 13 -19% [1, 2].

Like all monogastric animals rabbits cannot utilize non-protein nitrogen, so they require complete proteins containing essential amino acids. For this animal species there are ten of them, but additionally two more substitutes are being investigated, which can partially

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replace the essential ones. The diet must necessarily be balanced in histidine, leucine, arginine, isoleucine, phenylalanine + tyrosine, lysine, methionine + cystine, tryptophan, valine, threonine [3].

Vitamins and minerals are important. While the needs of water-soluble vitamins are satisfied by their synthesis by symbiont microflora in the large intestine, fat-soluble vitamins require balancing in diets. Vitamins D and A are not only necessary for various metabolic reactions, but they can affect the digestibility of essential nutrients.

The aim of the present studies was to determine the features of growth intensity of rabbits during early ontogenesis [1, 4].

2 Material and methods of research

The present research was carried out on the basis of rabbit breeding laboratory of V.Y. Gorin Federal State Budgetary Educational Institution of Higher Professional Education of Belgorod Agrarian University. Rabbits are kept in the room at the temperature of 17° C and relative humidity of 52%, illumination at the level of the animal is 100-150 lux, gas composition of the air corresponds to the normative values.

The animals are housed in KMP-1 cages equipped with nipple drinkers and hopper feeders. Feeding is carried out with full-fed compound feed PZK-95 for rabbit daughters of LLC "BELKORM" (total energy 270 kcal/100 g, crude protein 19.14%, crude fiber 13.9%).

Live weight was controlled by means of scales B1-15 "Sasha".

Evaluation of young rabbits was carried out by

- absolute growth (difference between the mass at the end and beginning of the period)
- average daily growth (the quotient of absolute growth and the number of days in the study period) [5, 6].

To achieve the goal, two series of experiments were set up. In the first one we determined the growth intensity in the neonatal period. For this purpose, 20 females were randomly selected and the weights of their rabbits at 1, 3, 7, 14, 21 and 30 days of age were monitored.

In the second series of experiments we determined the growth intensity of commercial young rabbits in the period after branding (40 days), weaning (50 days), prophylactic treatment against eimeriosis (60 days) and before slaughtering age (90 days). Two groups of young rabbits (n=10) were formed. Group I was fed a preparation based on essential oils (Ent-Oil Eymekon Dry) at a dosage of 0.2 ml/l for 10 days; Group II received a preparation belonging to the group of polyether ionophore antibiotics and possessing a wide spectrum of anticoccidial action (Cicocin) at a dosage of 0.5 g/kg of feed.

3 Research Results

The dynamics of growth intensity of rabbits up to 30 days of age is presented in Table 1.

When using complete feeds, the average live weight of a newborn rabbit was 53±2 g, and by the third day it increased 1.7 times. During this time the absolute gain amounted to 16±3 g, average daily gain was 8±3 g, and relative gain was 25±3 %. The intensity of growth of young animals during this period is provided by the consumption of colostrum, which is necessary for the formation of colostral immunity and further survival [7, 8].

Table 1. Growth intensity indicators of rabbits in the first month of life

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Average live weight, g</th>
<th>Absolute live weight gain, g</th>
<th>Average daily gain, g</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 day</td>
<td>53±2</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3 days</td>
<td>70±3***</td>
<td>16±2</td>
<td>8±1</td>
</tr>
</tbody>
</table>
From the third to the seventh day the live weight of rabbits increased by 46%, absolute gain amounted to 49±3 g, average daily gain increased by 62%. This period is characterized by transition from colostrum to milk. And although colostrum is characterized by a higher content of dry matter, protein and fat, the transition to milk production of which is steadily increasing and reaches its maximum on the 17th day of lactation, allows to maintain the trend to increase the average daily gain in the period from 14 to 21 days. Also in this time interval there is an increase in coprophagy (from the first days after birth the rabbit leaves in the nest a small amount of solid feces, which is consumed by rabbits, in this period this process is maximized), left by the female in the nest, and what is not unimportant in this period the rabbits have the opportunity to leave the nest and begin to get acquainted with the feed consumed by their mother [9, 10, 11].

By 30 days, the average live weight of young animals increases 2-fold, the absolute gain was 361±4 g, and the average daily gain increased by 88 %, relative to the previous studied time interval. In the period from 21 to 30 days there is a decrease in the lactation curve in females, and in rabbits there is a change in the basis of diet from milk to mixed fodder [9].

In the second series, the following results were obtained (Table 2)

<table>
<thead>
<tr>
<th>Age interval, day</th>
<th>Indicator</th>
<th>Group I (Ant Oil Amecon Dry)</th>
<th>Group II (Cicocin)</th>
</tr>
</thead>
<tbody>
<tr>
<td>40 days/40</td>
<td>Live weight, g</td>
<td>1138±47</td>
<td>1120±68</td>
</tr>
<tr>
<td>0-40 days/0-40</td>
<td>Average daily gain, g</td>
<td>27±1</td>
<td>26±1</td>
</tr>
<tr>
<td>52 days/</td>
<td>Live weight, g</td>
<td>1543±64</td>
<td>1410±78</td>
</tr>
<tr>
<td>40-52 days/</td>
<td>Absolute growth, g</td>
<td>361±36</td>
<td>333±22</td>
</tr>
<tr>
<td>64 days/</td>
<td>Average daily gain, g</td>
<td>33±3</td>
<td>30±2</td>
</tr>
<tr>
<td>52-64 days/</td>
<td>Live weight, g</td>
<td>2118±58</td>
<td>1972±71</td>
</tr>
<tr>
<td>90 days/</td>
<td>Absolute growth, g</td>
<td>605±24</td>
<td>562±48</td>
</tr>
<tr>
<td>60-90 days/</td>
<td>Average daily gain, g</td>
<td>50±2</td>
<td>47±4</td>
</tr>
<tr>
<td></td>
<td>Live weight, g</td>
<td>3305±62</td>
<td>3078±38**</td>
</tr>
<tr>
<td></td>
<td>Absolute growth, g</td>
<td>1187±46</td>
<td>1107±77</td>
</tr>
<tr>
<td></td>
<td>Average daily gain, g/</td>
<td>42±2</td>
<td>40±3</td>
</tr>
</tbody>
</table>

At branding of young animals at 40 days of age, live weight in I and II groups was 1138±47 g and 1120±68 g, average daily gain for this period was 27±1 g and 26±1 g, respectively, and growth tension was 177±1 % in both groups, during this period rabbits were with their mother. Before weaning the live weight increased by 361±36 g and 333±22 g, respectively, and the average daily gain increased by 33±3 g and 30±2 g (p<0.05), despite the stress received by the animals during branding.

According to the guidelines for working with laboratory animals for the staff of the State Budgetary Educational Institution of Higher Professional Education of N.I. Pirogov Russian National Research Institute of Medical Sciences, Ministry of Health of Russia, engaged in preclinical testing, the stress received by the rabbit at weaning belongs to type C: manipulation, causing moderate to severe pain and discomfort. (highest category D) and equates to predator-prey condition, prolonged immobilization (more than several hours) and intoxication of the body, etc. [12]. During this period, young animals experience a decrease
in immunologic reactions and as a consequence, diseases caused by opportunistic microorganisms and various species of eimeriae begin to appear. Therefore, it is in the first days after weaning the most rational to use coccidiostatics. In spite of all the above, the live weight in both studied groups increased by 605±24 g and 562±48 g, and the average daily gain was 50±2 g and 47±4 g, respectively, which is 55% (or 1.5 times) higher than the previous period (p<0.001) [13,14].

By 3-3.5 months of age, medium-sized and small breeds of rabbits begin sexual maturity. Animals try to build a rigid hierarchy, which is very often expressed by aggression towards each other. In the period from 60 to 90 days the live weight of experimental rabbits increased by 1187±46 g in group I and by 1107±77 g in group II, and the average daily gain decreased by 16 % (p<0,01 for animals receiving Ent-Oil Eymekon Dry as a prophylaxis).

4 Conclusions

In the first month of life, the average daily live weight gain of rabbits is steadily increasing. In the milking period this index amounted to 8±1 g, and in the milking period it increased from 13±1 in the next 4 days to 19±2 in the second week of life. In the next seven days it has only a tendency to increase by 2 g, which may be associated with the introduction of complete feeds into the diet and as a consequence of changes in the composition of microflora in the gastrointestinal tract. At decrease in the amount of consumed milk and increase in consumption of feed mixture at the fourth week from the moment of birth the investigated parameter increases up to 39±4 g. At the same time the live weight of rabbits for the first month of life increases from 53±2 g to 796±43 g.

The dynamics of increase in average daily gain is maintained in the next month of ontogenesis reaching its maximum in 50-60 days and reaching 47 - 50 g regardless of the method of prevention of eimeriosis. In the following month this indicator decreases to 40 - 42 g. And live weight increases to 3078 - 3305±62 g.

References

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