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EFFECT OF DIFFERENT FEEDING RATIIONS ON GROWTH AND CARCASS VALUE OF KIDS OF THE WHITE SHORT-HAIRED BREED

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Abstract

The evaluation of the effect of different feeding rations on growth and carcass value of kids of the *White Short-haired breed* was carried out on a goat farm in *Šošůvka*. From birth to the age of 20 days, all kids under study ($n = 33$) were reared in the same way, i. e. with their mothers and their contacts with mothers were not regulated. At the age of 20 days, altogether 22 kids were weaned and subdivided into *two groups* (A; $n = 11$ and B; $n = 11$). Remaining kids (group C; $n = 11$) were kept with their mothers till the end of the study. All three groups of kids (A, B and C), were identical and each group consisted of 6 males and 5 females. From 20 days of age till the end of the study the feeding ration of kids in group A consisted of meadow's hay (ad libitum), starter (ČOT) and milk drink. In group B, the post-weaning feeding ration consisted of meadow's hay (ad libitum) and milk drink. From 20 days of age till the end of the study the feeding ration of kids in group C consisted of mother's milk (ad libitum), meadow's hay (ad libitum) and starter (ČOT). For the evaluation of the growth ability all 33 kids were used. The evaluation of the carcass value of kids was carried out only in the males. The analysis of the effect of the different feeding rations on growth revealed that the average daily weight gains (ADWG) after weaning in groups A (0.168 kg) and B (0.155 kg) decreased ($P \leq 0.05$ and $P \leq 0.01$) as compared with group C (0.202 kg). As far as the ADWG from birth till the end of the experiment (i. e. 60 days) were concerned, the highest ADWG was found again in group C (0.210 kg) and the differences between the groups A and C and B and C were in both cases $P \leq 0.05$. The different feeding rations had significant effect only on carcass weight, dressing percentage, weight of kidney and proportion of kidney, while the highest dressing percentage (48,74 %) and kidney proportion (0,70 %) were found in both cases in group C. On the other hand, it should be mentioned that the different feeding rations did not significantly affected colour class (1.33 vs. 1.17 vs. 1.33), fattiness class (1.33 vs. 1.50 vs. 1.83), and proportions of leg and rack (31.10 % vs. 31.61 vs. 31.11 % and 20.85 % vs. 20.41 % vs. 21.35 %).

Keywords: feeding rations, growth, carcass value, White Short-haired breed

Introduction

Effect of different feeding rations on some performance parameters of kids were studied by *Pena-Blanco et al.* (1994), *Skřivanová et al.* (1995) and *Perez et al.* (2001). Effects of different restriction of milk supply on growth intensity of kids were evaluated by *Goetsch et al.* (2001). Effect of a traditional method of rearing of kids (with their mothers) on carcass value was evaluated by *Páleník* (1990).



The effect of the intensive fattening on the growth and carcass value of kids was evaluated by Ochodnický et al. (1991). The majority of goat farms in the Czech Republic apply a traditional method of rearing of kids, i.e. with their mothers till the age of two to three months. Artificial methods of rearing with application of different types of milk replacers are used above all in cases when the mother dies or cannot produce enough milk for kids.

However, the increasing demand for goat's milk and/or dairy products forces goat farmers to look for methods how to extend the lactation period not only from economic but also competitive reasons. In connection with above mentioned the main aim of our study was evaluated the effect of different feeding rations on growth and carcass value of kids of the White short-haired breed whereas this breed is the most important goat breed kept in Czech republic.

Material and methods

The evaluation of the effect of the different feeding rations on growth and carcass value of kids of the *White Short-haired* breed was carried out on a special goat farm in Šošůvka. For the evaluation of growth intensity altogether 33 kids were used. From birth to the age of 20 days, all kids were reared in the same way, i. e. with their mothers. In aforementioned period the feeding ration of all kids consisted of mother's milk (*ad libitum*) and meadow's hay (*ad libitum*). At the age of 20 days, altogether 22 kids were weaned and subdivided into two groups (A; n = 11 and B; n = 11). Remaining kids (group C; n = 11) were kept with their mothers till the end of the study. All three groups of kids (A, B and C), were identical and each group consisted of 6 males and 5 females. From 20 days of age till the end of the study the feeding ration of kids in group A consisted of meadow's hay (*ad libitum*), starter (ČOT) and milk drink. The average daily consumptions of milk drink and starter (ČOT) for the whole study period per kid in the group A were 0.94 l and 0.036 kg. In the same period the feeding ration in group B consisted of meadow's hay (*ad libitum*) and milk drink. The average daily consumption of milk drink per kid in this group was the same as in group A. In both groups the milk replacer MIKTEL (manufacturer Mikrop Čebín a.s.) was used. From 21st to 40th day of age, the lukewarm milk drink was given to kids in both groups three times a day and thereafter twice a day till the end of the study. In dependence on the age of kids, the dilution ratio of milk replacer: drinking water ranged from 1:7 to 1:8.5. The feeding ration of kids in group C in above-mentioned period consisted of mother's milk (*ad libitum*), meadow's hay (*ad libitum*) and starter (ČOT).



The estimated daily consumption of maternal milk and the average daily consumption of starter (ČOT) per kid in group C were 1.55 litres and 0.036 kg. In fine of aforementioned it is necessary to complete that during the whole study period all kids in all three groups had free approach to drinking water and salt lick. To the end of the experiment, when the average age of kids was 60 days, all males from each group were slaughtered. After 24 hours, cooled carcasses were evaluated and classed according to meat colour and fattiness by SEUROP. Carcass dissection was reduced to find only the proportions of leg and rack, respecting the weight and carcass size. For the mathematical and statistical evaluation the one-factor analysis of variance with subsequent testing according to Scheffe's method was used.

Results and discussion

The birth weights (*Table I*) of kids in all three groups were relatively very similar. The average live body weights of kids at the age of 20 days in all groups were also relatively very well-balanced. The highest average daily weight gain (ADWG) from birth to 20 days of age, i. e. in the period when all kids were fed in the same manner, was found in group C (0.226 g). On the other hand, the lowest ADWG in the same period was found in group A (0.213 kg), however the differences among individual groups in the growth ability in this period were not significant. The ADWGs of kids in the period from birth to 20 days of age were higher than found *Goetsch et al* (2001), but comparable with data published by *Skřivanová et al.* (1994). The evaluation of ADWGs of kids in all three groups between the 21st and 60th day of age indicate that the growth intensity decreased in both groups of weaned kids (A = 0.168 kg, B = 0.155 kg). In the non-weaned group C, the ADWG in this interval was 0.202 kg and the differences in the growth in this period between groups A and C and B and C were statistically significant ($P \leq 0.05$) and statistically highly significant ($P \leq 0.01$). The growth deceleration in groups A and B did not correspond with data published by *Skřivanová et al.* (1995) who found in kids fed by milk replacer ADWGs higher than 0.200 kg. On the other hand, however, it should be mentioned that the ADWGs found from 21 to 60 days of age in groups A and B are comparable with data published by *Goetsch et al.* (2001) and *Galina et al.* (1995). The differences in ADWG, especially within the interval from 21 to 60 days of age of kids, was manifested also in final average live body weights of kids in individual groups (A = 13.18 kg; B = 12.90 kg; C = 14.76 kg) whereas the differences between these weights in groups A and C and B and C were in both cases statistically significant ($P \leq 0.05$).



It should be mentioned to the end of this growth analysis that the statistically significant ($P \leq 0.05$) highest ADWG in the interval from birth to 60 days of age of kids was found in non-weaned kids (0.210 kg). This ADWG is comparable with data published by Kuchtík et al. (1999) and Skřivanová et al. (1995). The ADWG of kids weaned within the interval from birth to 60 days of age were relatively uniform (A = 0.183 kg; B = 0.178 kg). When comparing the ADWG in the groups A and B in the interval from birth to 60 days of age with data published by authors studying the effect of application of milk replacers on growth intensity it should be mentioned that these ADWG were comparable with data mentioned by Goetsch et al. (2001) and/or that these ADWG were higher than those found by Perez et al. (2001), Pena-Blanco et al. (1994) and Galina et al. (1994).

Different feeding rations had not significant effect on live body weights at slaughter (Table 2). On the other hand, there were statistically significant differences ($P \leq 0.05$) between groups A and C and B and C in average carcass weights and average dressing percentages. In the both cases the highest values were found in kids of the group C (7.33 kg and 48.74 %, resp.).

On the other hand, the average dressing percentage in group C was lower than found Luo et al. (2000) or Dhanda et al. (1999); however, it was comparable with data found by Mioc et al. (2001) and Kuchtík et al. (1999). The average dressing percentage of kids in groups A and B were 46.56 % and 45.92 % whereas both these values were higher than those found by Daskiran and Ertugrul (1994) and Ochodnický et al. (1991). However on the other hand Paleník (1990) and Perez et al. (2001) found higher dressing percentages.

Table 1. Effect of different feeding rations on growth (mean±sd)

Characteristic	Group			F-test
	A (n= 11)	B (n= 11)	C (n= 11)	
Live weight at birth (kg)	2,20±0,319	2,21±0,432	2,15±0,386	0,09
Live weight at 20 days of age (kg)	6,47±0,628	6,72±0,689	6,67±0,862	0,37
Live weight at 60 days of age (kg)	13,18±1,963 ^c	12,90±1,819 ^c	14,76±0,965 ^{a,b}	4,11*
Average daily weight gain from birth to 20 days of age (kg)	0,213±0,031	0,225±0,027	0,226±0,032	0,66
Average daily weight gain from 21 to 60 days of age (kg)	0,168±0,044 ^c	0,155±0,037 ^C	0,202±0,027 ^{a B}	5,03*
Average daily weight gain from birth to 60 days of age (kg)	0,183±0,034 ^c	0,178±0,028 ^c	0,210±0,014 ^{a,b}	4,68*

* - a, b, c - $P \leq 0,05$, ** - A, B, C - $P \leq 0,01$



Table 2. Effect of different feeding rations on basic parameters of carcass analyses (in kg and in %)(mean±sd)

Characteristic	Group			F-test
	A n= 6	B n= 6	C n= 6	
Live weight at slaughter (kg)	13,75±1,188	13,28±1,749	15,02±1,024	3,11
Carcass weight (kg)	6,41±0,690 ^c	6,10±0,747 ^c	7,33±0,707 ^{a b}	4,78*
Dressing percentage (%)	46,56±1,585 ^c	45,92±1,666 ^c	48,74±1,926 ^{a b}	4,34*
Skin (kg)	0,92±0,047	0,84±0,077	0,96±0,156	1,83
Skin (%)	6,70±0,313	6,37±0,470	6,34±0,677	0,92
Kidney (kg)	0,070±0,023 ^C	0,066±0,018 ^C	0,106±0,009 ^{A B}	9,37**
Kidney (%)	0,50±0,139 ^C	0,49±0,103 ^C	0,70±0,041 ^{A B}	8,16**
Kidney fat (kg)	0,095±0,055	0,082±0,046	0,143±0,048	2,56
Kidney fat (%)	0,67±0,363	0,59±0,263	0,94±0,265	2,17
Colour class	1,33±0,516	1,17±0,408	1,33±0,516	0,24
Fatness class	1,33±0,516	1,50±0,548	1,83±0,408	1,59
Leg (kg)	2,00±0,283	1,93±0,274	2,28±0,196	3,13
Leg (%)	31,10±1,275	31,61±1,167	31,11±1,044	0,39
Rack (kg)	1,34±0,231	1,25±0,224	1,57±0,233	3,10
Rack (%)	20,85±1,473	20,41±1,520	21,35±1,320	0,63

* - a, b, c - $P \leq 0,05$, ** - A, B, C - $P \leq 0,01$

The average proportions of skin ranged from 6.70 % (group A) to 6.34 % (group C). However both these values were lower than those found by *Ochodnický et al.* (1991). The evaluation of the average proportion of kidneys revealed that the highest value of this parameter was observed in kids reared together with their mothers (C = 0.70 %) while in groups A and B the average values of this parameter were 0.50 % and 0.49 %, respectively, and the differences between groups A and C and B and C were in both cases statistically highly significant ($P \leq 0.01$). However on the other hand the different feeding rations had not significant effect on the average proportion of kidney fat.

The different feeding rations had not significant effect on colour of meat and fattiness. The relatively best colour class of meat was found in the group B (1.17) and the lowest class of fattiness was found in group A (1.33). On the other hand the relatively highest class of fattiness was found in group C (1.83), whereas in this group the colour class was 1.33.

The evaluation of weights and proportions of the selected cuts (leg and rack) revealed that there was no statistically significant effect of individual groups of kids on these parameters. In the concrete, the average proportions of leg ranged from 31.10 % (group A) to 31.61 % (group B) and both these values were comparable with data published by *Reismann and Seifert* (1992) and *Luo et al.* (2000).



The average proportions of rack ranged in individual groups from 20.41 % to 21.35 %, when both these values were higher than those found by *Ochodnický et al.* (1991) and *Reismann and Seifert* (1992).

Conclusion

Different feeding rations had a significant effect on the growth ability of kids of the White Short-haired breed whereas the highest daily gain in the period from birth to 60 days of age was found in group of kids reared with their mothers. The different feeding rations had also significant effect on dressing percentage and weight and proportion of kidney. On the other hand the different feeding rations had not significant effect on fattiness class, colour class of meat and proportions of leg and rack.

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