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Author email: wkishk@hotmail.com

Effect of lactation period prolongation on marketing weight of growing rabbit puny

W. H. Kishk

Department of Animal Production, Faculty of Agriculture, Suez Canal University, Ismailia, Egypt

Abstract

A total of 150 of growing rabbit puny after birth of White New Zealand rabbit were divided into two groups. The first group was weaned at 35 days of age (control group).While the second group was weaned at 60 days of age. Both groups were subjected to growth rate measurements, mortality rate, blood metabolites levels, and marketing weight at 10 weeks of age. Data showed that there were significant differences ($P < 0.05$) between two groups in most of studied criteria. Where weaning at 60 days of age enabled growing rabbit pups to reach a higher body weight at marketing age (10 weeks). Marketing body weight averaged 1.845 ± 0.48 (Kg) and 1.650 ± 0.35 Kg for delayed weaning and control group, respectively. It could be concluded that weaning at 60 days of age as for growing rabbit is better to get a higher marketing weights for rabbit meat production especially for extensive and semi-intensive rabbit breeding programs.

Key words: rabbit puny, growth rate, marketing weight, blood metabolites, mortality rate

Introduction

Many investigators have suggested that much of the interspecific variability in growth rates is due to differences in physiological constraints upon growth (Case 1978).
The newborn, whether premature or mature, is able to digest monosaccharides and disaccharides, and protein, with little difficulty. Fats are less readily absorbed, although all infants have fat-splitting enzymes present in the gut (Llewellyn-Jones, 1992).
Rabbits have been reared for several reasons. One of them is meat production. Selection for growth rate is currently practiced in commercial sire lines of genetic schemes for rabbit improvement (Baselga and Blasco, 1989; Lebas et al., 1996). One of the most management problems is the digestive trouble which observed after weaning. This problem could be a consequence of a disturbance in the digestive system development due to inadapted composition of the diet ingested before weaning (Gidenne, 1997). Boriello and Carman, 1983 showed that degradation of a high quality of starch in the caecum favoured pathogenic flora. Moreover, feeding rabbits a high starch diet before weaning altered their viability after weaning (Lebas, and Maitre, 1989).
Increasing the weaning age seemed to reduce both the stress in litters caused by separation from their dams and time required to achieve suitable food consumption levels (Xiccato, 2003). The objectives of this work are to find out effects of lactation period

prolongation on marketing weight, growth rate, mortality rate, food consumption and blood metabolites of growing rabbit puny.

Materials and Methods

150 Newborn White New Zealand rabbit pups were allocated into two groups. The first group was weaned at traditional weaning age up to 35 days. While the second group was weaned up to 60 days of age. Both groups were subjected to the following measurements: growth rate through weekly live weight (LW) and finally after 10 weeks of age at marketing weight, mortality rate from birth until marketing age, blood metabolites levels of total protein, total lipids, blood sugar , blood criateine level and N-Urea content during the experiment period. All does were kept at Experimental Farm of Faculty of Agriculture, Ismailia, Egypt. 25 Multiperous of White New Zealand rabbit does were reared in a galvanized wire cages for reproducing. The cages were equipped with automatic drinkers and manual feeders and a photoperiod of about 12 h was provided. To obtain 150 of newborn rabbit pups for an average of 6 newborn kids per doe for each litter size were collected. In first group (normal weaning) NW does reared the young kids in the traditional manner until they were weaned at 35 days of age. While, in the second group, (delayed weaning) DW does reared young kids until they were weaned at 60 days of age.

In both groups, the young rabbits and rabbit does used in the experiment were fed pelleted rabbit feed (CP: 16.8%, CFat: 2.9%, CF: 14.1%, 10.3 DE MJ/kg), without any kind of supplementation. The various pelleted feedstuffs provided were available in *ad libitum* quantities, and the rabbits also had free access to drinking water from automatic nipples.

Statistical analyses of the experimental data was performed by means of one-way analysis of variance (ANOVA-test), according to Steel and Torrie (1982) with SPSS 8.0, (1997) software for the effect of weaning age on growth rate, marketing weight, mortality rate, blood metabolites levels. Duncan's multiple range test (1955) was used to test significant differences among different means of studied parameters.

Results and Discussion

Results of the main effects of the weaning age on litter performance are presented in Table 1. In which body weight did not differ significantly ($P<0.05$) between two groups especially after 3rd and 5th week of age. Where live body weights were 569 and 582 g for normal and delayed weaning, respectively at 5th week of age. While significant differences began from 7th week of age for two groups. Where body weight average was 1101 and 1200 for normal and delayed weaning groups at 7th week of age, respectively. Moreover marketing body weight averaged 1.650 ± 0.35 Kg and 1.845 ± 0.48 Kg for normal and delayed weaning and they differed significantly ($P<0.05$) . These results are go along with Xiccato et al., 2003, where delayed weaning is better than normal or early weaning to avoid weaning shock. In which young kids can move from liquid feeding to solid feeding gradually along a suitable period instead of a condensed or short period. This long period enabled full development for caecum without occurrence of digestive disorders. The main digestive disorder can be presented is diarrhea which leads to body weight loss and incomplete availability and digestibility of ingested food. Caecum plays a

key role in fiber digestion in growing rabbits and caecal activity is very important to determine age of weaning in rabbits. In this study growth rate across different weeks of young rabbit ages as presented in Table 1 was better and differed significantly ($P< 0.05$) in second group (delayed weaning) than first group (normal weaning) especially at 7^{th}, 8^{th} and 10^{th} week of ages. This is may be due to that growing rabbits in second group (delayed weaning) do not face sudden movement from liquid feeding to solid feeding. This sudden movement can cause a high activation rate of pathogenic bacteria especially in digestive tract which lead to high mortality rate during this period as shown in Table 1. In which mortality rates reached 7, 10 and 15 for normal weaning whereas it reached 6, 8 and 11 for delayed weaning as for 7^{th}, 8^{th} and 10^{th} week of age, respectively. In addition these mortality rates differed significantly ($P < 0.05$) for two groups as shown in Table 1. Low mortality rate in second group (delayed weaning) can explain high efficiency of digestive tract as for digestion and absorption of ingested food. This efficiency can be reflected high live body weight and high body weight gain in addition normal development of immune system which leads finally to decrease mortality rate at the marketing age (10 weeks) as shown in Table 1.

Blood metabolites levels as for two groups were differed significantly ($P < 0.05$) as regards total protein and blood-Urea which indicate the better digestibility and usage of protein content by second group than first group of normal weaning. This can explain high growth rate of second group compared to first one at 35 days of age.

In addition, effects of weaning period on weight gain (W.G), food intake (F.I), weight gain / food (W.G/F) (g/Kg) and mortality rate percent (M.R %) during 10 weeks of age are presented in Figure 1. It is seemed to get better results from delayed weaning as for W.G, F.I, W.G/F and M.R %. Both W.G/F and M.R % differed significantly ($P< 0.05$) between two groups of weaning age as shown in Figure 1.

It could be concluded that delayed weaning (60-days) could be recommended as a good tool to avoid early weaning problems which accompany normal weaning especially first two days to avoid weaning shock. Delayed weaning can improve growth rate, average weight gain / food (g/ Kg) and subsequently can increase marketing weight at 10 weeks as pointed out from this experiment.

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Table1. Performance of WNZ growing rabbits during the weaning period from birth until weaning and during the growth period from weaning up to 10 weeks of age.

Weaning period Days	Normal Weaning 35-Days						Delayed Weaning 60-Days					
Weaning period plus growth period (weeks)	1st	3rd	5th	7th	8th	10th	1st	3rd	5th	7th	8th	10th
No. of growing rabbits	75						75					
Average body Weight	93.1	370	569	1101^{A}	1346^{A}	1.650^{A}	105.5	395	582	1200^{B}	1490^{B}	1845^{B}
(g)±SE	20.2	28.3	30.5	35.1	38.6	40.3	18.3	21.6	27.4	33.8	31.7	38.5
Average weight gain(g/d)	13.3	19.7	38^{A}	35^{A}	21.7	------	15.1	20.7	44.1^{B}	41.4^{B}	25.4	-----
±SE	5.1	6.6	12.5	13.2	14.7	-------	5.5	5.9	10.3	12.7	13.9	------
Average food intake (g/d)	----	71.5	126.0	166.9	190.8	238.4	-----	73	130	170	192	244.6
±SE	-----	12.9	25.8	30.4	38.7	46.7	-----	12.2	21.6	26.8	31.4	40.5
Average weight gain/food	-----	276	302^{A}	210^{A}	114^{A}	-------	------	284	339^{B}	244^{B}	132^{B}	-------
(g/kg) ±SE	-----	30.2	38.6	25.6	18.9	-------	------	31.5	35.4	27.6	15.6	--------
Mortality rate	2	4	5	7	10	15^{A}	1.8	3.7	4.5	6	8	11^{B}

Means with two different letters are significant different at (P 0.05).

Table 2. Means ±SE of blood serum metabolites of growing White New Zealand rabbits during lactation period and up to marketing age (10- weeks).

Blood Metabolites	Normal Weaning At 5 weeks					Delayed Weaning At 8 weeks				
	3rd	5th	7th	8th	10th					
Total Protein (g/dl)	4.12	4.4	4.6	5.15^{A}	5.55^{A}	4.26	4.45	4.72	6.35^{B}	6.61^{B}
±SE	0.22	0.39	0.31	0.28	0.29	0.25	0.34	0.39	.27	0.21
Total Lipids	350	342	339	320	310	342	321	330	327	301
(mg/dl) ±SE	5.33	4.41	6.61	5.28	6.31	4.51	5.26	4.68	6.87	5.73
Creatinine	1.1	1.3	1.4	1.44	1.34	1.2	1.35	1.46	1.56	1.48
(mg/dl) ±SE	0.07	0.04	0.06	0.07	.09	0.06	0.03	0.04	0.06	0.08
Urea-N	13.2	13.6	14.45	15.0^{A}	17.5^{A}	14.32	15.6	14.86	17.2^{B}	19.66^{B}
(mg/dl) ±SE	0.45	0 .39	0.55	0.62	0.81	0.33	0.47	0.41	0.59	0.74
Blood Glucose	241	250	260	265	260.5	235	240	266	277	271
(mg/dl) ±SE	4.61	7.85	5.66	8.52	6.68	5.28	6.39	4.49	7.29	6.27

Means with two different letters are significant different at (P 0.05).

Figure1. Effect of weaning period on weight gain (W.G),average food intake (A.F.I.)weight gain/Food (W.G./F.)(g/kg) and mortality rate (M.R%) during 10 weeks of age.