Journal homepage www.jzs.univsul.edu.iq
Journal of ZankoySulaimani
Part-A- (Pure and Applied Sciences)

Effect of Feed Restriction in Period on broiler chicken Performance and Carcass traits.

Hersh A. faraj
Sulaimaniyah University, Faculty of Agricultural science, Animal production Department
Email: hearshabdul@yahoo.com

Article info
Original: 6 May. 2015
Revised:23 August. 2015
Accepted:30 August. 2015
Published online: 20 March. 2016

KeyWords:*Performance, Carcass traits, Feed Restriction, Finisher Period, Broiler.*

Abstract

The feed restriction program is one of the main techniques in growth curve manipulation for increasing production efficiency in broiler chicken, therefore, this experiment was conducted to determine the effects of different feed restriction levels, at finisher phase from 30 to 42 days, on productive performance and carcass traits. In this experiment a number of 90 Male Ross broilers were used, the chicks were distributed into five treatments at three replications for each treatment and six chicks for each replication. The first group was control (T1) which the chicks of this group were fed according to Ross Management Manual, and (10, 15, 20 and 25% less than Ad-libitum) for T2, T3, T4 and T5 respectively. The results showed that feed intake at different levels was significantly ($p<0.05$) less than the control group. Meanwhile, at 42 days old Live weight, body weight gain and feed conversion ratio of (T2, T3, T4 and T5) were numerically less than the control group, nevertheless, these differences were not significant ($p>0.05$). The results also show that carcass traits were significantly ($p<0.05$) affected by feed restriction at which abdominal fat percentage in all treatment groups were significantly ($p>0.05$) lower compared to control group. Meanwhile carcass weight, gizzard percentage and dressing percentage in all treatments were numerically lower than the control groups, however differences were not significant ($p>0.05$). In conclusion; results shows that using feed restriction (less than the Ad-libitum feed intake decreased significantly the feed intake without any effect on productive performance and carcass traits.

Introduction

Growth performance of broiler chickens has been increased especially In the last three decades mainly due to the development of biotechnology and the genetic revolution, betterment of nutrition and management lead to take only 33 days to reach marketing weight approximately 2 kg [1]**,** In commercial poultry production system benefit can be maximized by minimizing feed cost, about 60-70 percent of the expenditures involved in poultry production is feeding costs[2] One such method is restricting the amount of daily feed offer for some time [3] . Feed intake in broilers are positively affected by controlling the wastage of feed. Furthermore, a competition between human and poultry for energy has made a problem of the decline of feed ingredients, the wastage of feed sources through free feeding. In addition constant development in nutrition and genetic selection, has led to a fast growth rate in modern broiler strains, any attempt to improve commercial poultry production and increase its efficiency, therefore, needs to focus on better utilization of available feed resources**.** One such method is restricting the amount of daily feed offer for some time and stimulating compensatory growth [4]. feed restriction programs in smaller age used to decrease abdominal and carcass fat in broiler chickens depend on the phenomenon called compensatory growth or catch up growth to produce market body weight similar to control groups compensatory growth or

slow growth is defined as abnormally rapid growth relative to age. This phenomenon if used for long time considered to an effective methods to reduce growth rates and changing body composition of most animals [5], also feed restriction resulted in compensatory growth and in turn lead to an improvement of the farm economy [6]. Feed restriction in finisher period caused reduction abdominal fat percentage and development of feed conversion ratio in broiler chicken [7]. On the other hand, feed restriction could be applied at the finisher period. It is claimed that feed restriction at the finisher period is a better growth performance of broiler chicken [8].

Materials and Methods

This study was conducted to study the effects of different feed restriction levels, at finisher period from 30 to 42 days of broiler age, on productive performance and carcass traits. . 90 male chicken of strain Ross 308 broiler were housed in disinfected and well ventilated room. All chicken were treated as one group during the starter and grower period. On day 29, after 6 hours fasting, all birds were weighted individually and distributed randomly into 5 experimental treatments, each with 3 replicates, each replicate contains 6 birds. Birds were provided feed consist of (19 % CP and 3200 Kcal ME/Kg). The five experimental feeding strategies consist of, (Control) ad-libitum feed intake and four restricted levels: 10, 15, 20 and 25 % .were less than Ad-libitum feed intake. Weight gain, feed intake and feed conversion ratio were calculated. At the end of the experiment six chicken selected randomly from each treatment group were fasted for 12 hours,The slaughter procedure were done for dressing percentage evaluation , gizzard and abdominal fat calculated as the proportion of dressing carcass weight and to slaughter weight. The significant differences between the means of traits were determined using Duncan's multiple range test [9]. Under the probability $P<0.05$.

Table1.Ingredient of the finisher diet used in the experiment.

Ingredients	**% diet**
Yellow Corn	59
Soya bean meal	20
Protein conc.*	3.2
Wheat	15
Sunflower oil	2.5
Salt	0.3
Total	100
Calculated composition	
Protein	19
ME Kcal / Kg	3200
Calcium	0.74
Phosphorus	0.41
Lysine.	1.3
Methionine.	0.62
Meth. to Cyst.	0.96

*(WAFI) Protein concentrate used in the diets which contains: 40 % crude protein, 2100 Kcal ME / Kg.

Result and discussion

Feed intake significantly ($p<0.05$) reduced because the feed restriction affected negatively on feed intake this result agrees with [10]. Meanwhile the feed conversion ratio was not influenced by different feed restriction levels ($p>0.05$). This agreed with the findings of [11],that the feed restriction not improved the feed conversion ratio in broiler. Average weight in 30 days old are not significant ($p>0.05$), meanwhile average weight gain in 42 days old in all treatments was lower than control, but no significant ($p>0.05$) difference observed between groups. Using of 15, 20 and 25 % feed restriction in this research showed reduction in final body weight at 42 day old compared to the control ($p<0.05$). The results are according to [6] that reported feed restriction can exert negative effects on the body weight at marketing age. The reasons for this situation are increasing the severity of feed restrictions and decreasing of nutrients for growth of chicks. This agreed with the finding of [10], in which suggested the old chicks are not able to compensate growth.

Table 3. Effects of different levels of feed restriction on broiler performance Traits (±SE)

Treatment	Feed Intake(g) Feed	Body Weight (30)day	Body Weight (42)day	Weight Gain(g)	Conversion Ratio
Control	2508 ± 20.50^{A}	1520 ± 20^{A}	2730 ± 30^{A}	1210 ± 20^{A}	2.07 ± 0.29^{A}
T2	2360 ± 23.15^{B}	1517 ± 33^{A}	2697 ± 35^{A}	1180 ± 32^{A}	2.00 ± 0.29^{A}
T3	2251 ± 21.22^{C}	1516 ± 25^{A}	2650 ± 33^{A}	1134 ± 25^{A}	1.98 ± 0.04^{A}
T4	2148 ± 30.12^{D}	1506 ± 15^{A}	2610 ± 40^{B}	1104 ± 40^{B}	1.94 ± 0.15^{A}
T5	2014 ± 25.12^{E}	1500 ± 28^{A}	2560 ± 50^{B}	1060 ± 45^{B}	1.90 ± 0.17^{A}

Different superscripts within columns are differ significantly.

*=Significant at $P<0.05$.

Carcass weight and abdominal fat percentage in all levels of feed restrictions significant ($p<0.05$) differed the result in present study partially agreed with those reported by ***[8]***. But gizzard and dressing percentage was notsignificantly ($p>0.05$) improved. Increasing the feed restriction level resulted in significant ($p<0.05$) linear reduction of abdominal fat percentage compared to the control. The reason for this probably, birds were unable to maintain consume adequate energy for supply of energy requirement for maintenance and growth, consequently were forced to use of carcass energy deposited such as abdominal fat .The results are accordance with [12] , [8] and[10].

Table4. The Effects of different levels of feed restriction on carcass traits (±SE).

Treatment	Carcass weight	Dressing %	Gizzard %	Abdominal fat %
Control	1938.3 ± 20.10^{A}	71 ± 2^{A}	1.00 ± 0.10^{A}	2.00 ± 0.12^{A}
T2	1941.84 ± 25.20^{A}	72 ± 1.3^{A}	0.97 ± 0.06^{A}	1.50 ± 0.01^{B}
T3	1934.5 ± 30.60^{A}	73 ± 1.6^{A}	0.98 ± 0.24^{A}	1.20 ± 0.01^{B}
T4	1957.5 ± 25.40^{A}	75 ± 1.0^{B}	1.0 ± 0.14^{A}	1.11 ± 0.15^{B}
T5	1920 ± 23.50^{A}	75 ± 1.5^{B}	0.97 ± 0.15^{A}	1.05 ± 0.15^{B}

Different superscripts mean Least squares means within a column are significantly different; *=Significant at $P<0.05$; NS = non-significant, SE=standard Error.

CONCLUSION

The results were obtained from current study demonstrated that using feed restriction levels (10% and 15%) less than Ad-libitum feed intake in finisher phase, did not show any contrary effects on performance and carcass traits, therefore, It can be concluded that this strategy can effect economically to decrease the cost of feeding in broiler chicken production with low cost, in commercial farm.

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