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Response of broiler to skip a day (SAD) feeding

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Abstract

One hundred and eighty day-old broilers were used to investigate the response of broilers to skip-a-day feeding regime. Broiler chicks were either fed ad libitium or subjected to 1,2,3,4 or 5 week skip-a-day feeding thereafter fed ad libitium to market age. Result at market age showed that feed intake was significantly reduced (P<0.05), P>0.025) while weight gain and feed to gain ratio were not significantly affected (P>0.05, P>0.025)by skip-a-day feeding. Skip-a-day feeding did not affect mortality of broilers (P>0.05),P>0.025). protein retention, fat retention and fibre utilization were comparable for broilers in all treatments (P>0.05, P>0.025). Abdominal fat pad was significantly reduced (P<0.05,P<0.025) by the skip-a-day feeding when compared with ad libitum feeding. The economic data showed that cost of production was reduced (P<0.05, P<0.025) by the application of skip-a-day feeding. However cost to benefit ratio remained comparable (P>0.05,P>0.025) when the two feeding systems were compared. It was concluded that, if approximately applied, skip-a-day feeding could result in sufficient cost reduction to be of commercial importance.

Keywords: Skip-a-day (SAD) Feed intake, Weight gain, Cost to benefit ratio, Nutrient retention

Introduction

Reduction in the cost of poultry feeding is by far the most important focus of researchers at least in the developing countries today. This is not unconnected with the ever increasing cost of feeding birds that is almost making it difficult for poultry farmers to break even. Ogundipe (1991), observed that cost of feeding accounts for 70% of cost of production in poultry business. The prevailing socio-economic situations do not even allow the so called unconventional feed ingredients to remain continuously available at low cost. The challenge is then for the nutritionists to find ways of reducing the cost of poultry production.

Although Skip-A-Day (SAD) feeding has been a standard method of reducing growth and excessive fat deposition in broilers and breeders pullets. Its application at the early stage of broiler growth with opportunity for realimentation might help in reducing cost of feeding with no adverse effect on broiler performance at market age. This study was designed to investigate the response of broilers to a Skip-A-Day feeding regime.

Materials and Methods

One hundred and eighty day old Anak broiler chicks of a mixed sex were housed in an electrically heated battery brooder and fed the diets in Table 1.

Table 1 *Percentage Composition of diet*

Ingredient	Starter	Finisher
Yellow maize	42.03	60.00
Soyabean cake	29.81	17.47
Brewer dried grain(BDG)	10.00	6.27
Maize offal	8.00	10.45
Blood meal	3.03	2.94
Bone meal	3.58	-
Oyster shell	2.69	1.94
Salt	0.25	0.25
*Vit. Min premix	0.25	0.25
DL-methinione	0.10	0.10
Analysed nutrient content		
Dry matter %	95.73	96.12
Protein %	22.60	17.20
Fat %	7.50	3.00
Fibre %	3.50	4.00
ME (Calculated Kcal/Kg)	3081.20	3024.00

*provide per kg of diet, Vitamin A (8000IU); Vitamin D3(1,200IU); Vitamin E (3IU); Vitamin K3 – Kastab (2mg), Vitamin B2 – Riboflavin (8mg), Vitamin B3 – Nicotinic acid (10mg), Vitamin B5 – Pantothenoic acid (150mg). Manganese (Mn), (80mg) Zinc (Zn) (50mg);Copper (Cu)(2mg); Iodine (I) (1.2mg); Cobalt (Co)(0.2mg), Selenium (Se) (0.1mg).

Chicks were fed the starters diet during the one (1) week of stabilization, weighed and randomly assigned to six treatments. Birds in the control group were fed *ad libitum* throughout the trial while in other treatments birds were subjected to Skip-A-Day feeding for 1,2,3,4, or 5 weeks followed by *ad libitum* feeding to eight weeks of age. Thus there were six treatments each with 3 replicates of 10 chicks per replicate. Water was given to satisfaction during and after the restriction period. Records of feed intakes and weight of birds were taken weekly. Mortality was also recorded as occurred. A nutrient retention trial was conducted at the 3rd and 7th week of the experiment using total collection method. The proximate analysis of the faecal sample and feed were done using the method of A.O.A.C (1980). At the end of the feeding trial, 3 birds were randomly selected from each replicate, weighed and slaughtered by exsanguinations. Carcass weight was taken after evisceration. The adipose tissue around the gizzard and intestine extending within the ischium and surrounding the cloaca, bursal of fabricius and adjacent abdominal muscles were collected and weighed as the abdominal fat. Economic parameter considered were determined using the prevailing market prices of ingredients used in compounding the diets and that of broilers on live weight basis. The data collected were subjected to analysis of variance as described by Steel and Torrie (1980) for a randomized design. Significant difference in means were tested at 5% and 2½% using Duncan multiple range test. Duncan,(1955).

Results

The effects of Skip-A-Day (SAD) feeding on the performance and economics of production of broilers is shown in Table 2.

During the restriction period (1- 5 weeks), for broilers placed on full feeding, skip-A-Day for 1,2,3,4 and 5 weeks; average feed intakes per bird were 1910, 1963,1756, 1415,1208 and 863g

respectively; weight gain of 806, 661, 559, 504 and 365g respectively with the corresponding feed to gain ratio of 2.37, 2.31, 2.61, 2.54, 2.40, and 2.29 respectively. For all of these parameters, there were significant ($P<0.05$,$P<0.025$) reduction when broilers on full Feeding were compared with those subjected to restricted feeding. At the post-restriction period (6-9 weeks) none of the performance parameters that is feed intake, weight gain and feed to gain ratio was significantly affected ($P>0.05$,$P>0.025$).

At the market age, that is the combined starter and finisher period (1 – 9weeks) feed intake for broilers placed on full feeding, Skip-A-Day for 1,2,3,4 and 5 weeks were 4157, 4468, 4159, 3506, 32247 and 3079g respectively with the corresponding feed to gain ratio of 2.57, 2.27, 2.62, 2.55, 2.44 and 2.31 respectively. Only the feed intake was significantly reduced ($P>0.05$,$P<0.025$) while both weight gain and feed to gain ratio were comparable ($P>0.05$), $P>0.025$) between the birds fed *ad libitum* and those subjected to SAD feeding for 5 weeks to 4.80% for broiler on *ad libitum* feeding. The economic parameter (Table 2) shows that the cost to benefit ratio of producing a broiler on SAD feeding was not significantly different ($P>0.05$,$P>0.025$) when compared with that of broiler on *ad libitum* feeding.

Table 2 *The effects of SAD feed on the performance and economics of broiler production*

	Restricted Period			Post-Restricted Period			Combined Period				
Treatment	Feed Intake (g)	Weight gain (g)	Feed to gain ratio (g)	Feed intake (g)	Weight gain (g)	Feed to gain ratio (g)	Feed intake (g)	Weight gain (g)	Feed to gain ratio (g)	%Mortality	Cost/benefit
Control (Full feeding)	1910^{e}	806^{e}	2.37^{ab}	2247	808	2.78	4157^{e}	1614	2.57	4.80	0.54
SAD 1 Week	1963^{e}	850^{d}	2.31^{a}	2505	821	3.05	4468^{e}	1617	2.27	19.10	0.59
SAD 2 Weeks	1756^{d}	661^{c}	2.67^{b}	2513	924	2.72	4159^{e}	1585	2.62	0.00	0.56
SAD 3 Weeks	1415^{d}	559^{bc}	2.54^{b}	2039	829	2.46	350^{b}	1374	2.55	9.50	0.54
SAD 4 Weeks	1208^{b}	504^{b}	2.40^{ab}	2103	815	2.58	3247^{ab}	1333	2.44	0.00	0.54
SAD 5 Weeks	836^{a}	365^{a}	2.29^{a}	2243	967	2.32	3079^{a}	1332	2.31	4.80	0.55
SEM	100	46	0.05	75	44	0.16	151	55	0.07	2.90	0.02
Significance	*	*	*	NS	NS	NS	*	NS	NS	NS	NS

Means bearing different superscripts in the same column differ significantly. ($P<0.05, P<0.025$)
NS – No significant difference among means in the same column
SAD Skip-A-Day
Cost/Benefit- Cost of production divided by revenue from sale of birds.

Table 3 shows the effect of SAD feeding on nutrient utilization by broiler. Whether in the 3rd of 7th week, protein and fat retentions were not significantly influenced (P>0.05,P>0.025) by SAD feeding.

Table 3 *Effect of Skip-A-Day on nutrient utilization by broilers (%)*

	3rd Week			7th Week		
Treatment	Protein	Fat	Fibre	Protein	Fat	Fibre
Control (Full feeding)	65.63	83.27	41.74	63.83	70.56	45.07
SAD 1 Week	61.20	83.41	42.43	57.77	66.45	43.86
SAD 2 Weeks	64.39	80.72	43.43	68.94	80.45	43.15
SAD 3 Weeks	55.56	82.06	44.41	68.82	72.85	42.68
SAD 4 Weeks	57.61	77.33	43.77	64.71	73.24	42.82
SAD 5 Weeks	56.06	84.25	42.15	70.43	84.29	43.35
SEM	1.37	0.78	0.51	1.45	2.09	0.57
Significance	NS	NS	NS	NS	NS	NS

Means bearing different superscripts in the same column differ significantly. (P<0.05,P<0.025)
NS – No significant difference among means in the same column
SAD Skip-A-Day

Also, fibre utilization was not significantly affected (P>0.05,P>0.025). these were all compared with broilers on *ad libitum* feeding.

The effects of SAD feeding on carcass percentage and abdominal fat is as presented in Table 4.

Table 4 *Effect of Skip-A-Day(SAD) feeding on carcass % and abdominal fat pad of broiler chickens*

		Abdominal fat pad	
Treatment	Carcass	Absolute weight (g)	% of carcass
Control (Full feeding)	82.01	40.0^{c}	3.04^{c}
SAD 1 Week	77.12	35.0^{c}	2.58^{c}
SAD 2 Weeks	76.58	19.2^{b}	2.01^{b}
SAD 3 Weeks	72.24	20.8^{b}	2.45^{b}
SAD 4 Weeks	75.98	15.9^{b}	2.17^{b}
SAD 5 Weeks	75.22	11.0^{a}	1.23
SEM	1.00	3.62	0.25
Significance	NS	*	*

*Means carrying different superscripts within column differ significantly. (P<0.05)
NS – No significant difference among means in the same column

Carcass weight on percentage basis were comparable (P>0.05, PP>0.025) for broilers in all treatments. These figures ranged from 72.24% in SAD feeding for 3 weeks to 82.01% in full fed broilers. There was significant (P<0.05). P<0.025) reduction in abdominal fat

as the period of restriction increased. The corresponding values for full fed broilers, SAD feeding for 1,2,3,4 and 5 weeks are 40.0,35.0,19.2, 20.8, 15.9 and 11g respectively.

Discussion

Expectedly, reduction in feed intake of broilers on SAD was a direct response to birds limited access to feed compared with those of the control (*ad libituml* feeding). The post restriction period when the birds had access to feed to satisfaction was accompanied by compensatory growth in birds earlier subjected to feed defined as the growth that is faster than normal after a period of feed restriction (Moran, 1979, Szepesi, 1980). Plavnik *et al.*,(1986) reported an improved feed efficiency with comparable 56-day body weights of broilers after a period of feed restriction. The overall performance of broilers in the present study supports this observation. The comparable body weights and significantly reduced feed intake resulted in improved feed to gain ratio in the fasted broilers. Even at post-restriction, fasted birds did not consume more than the control despite the presentation of feeds probably because they were smaller in size than the control birds. There is a relationship between body size and feed intake. Cabel and Waldroup (1990) reported that birds fasted from 1 day of age responded to subsequent feeding with immediate cell multiplication.

Presumably, the comparable protein retention could also be linked with comparable body weight observed. Boekholt *et al.*,(1994) reported that protein retention determines live weight gain in animals. The non significant results in fibre utilization is a confirmation of birds limited ability to utilize dietary fibre.

Skip-A-Day feeding would probably be used in controlling carcass downgrading and sudden death syndrome associated with excessive fat in broilers. This is because of the significant reduction of the fat pad in the fasted birds. Interestingly, fasting birds on Skip-A-Day basis for even up to five weeks did not result in cannibalism among broilers as might be expected. This then suggests that once water is made available to satisfaction, fasting broilers for such a period would affect their livability.

In conclusion, SAD feeding of birds for a period of up to 5 weeks has been shown in this study to reduce feed intake with no adverse effect on weight gain and feed to gain ratio. Abdominal fat was also significantly reduced. The reduction in the cost of production could be sufficiently high enough to be of commercial importance.

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