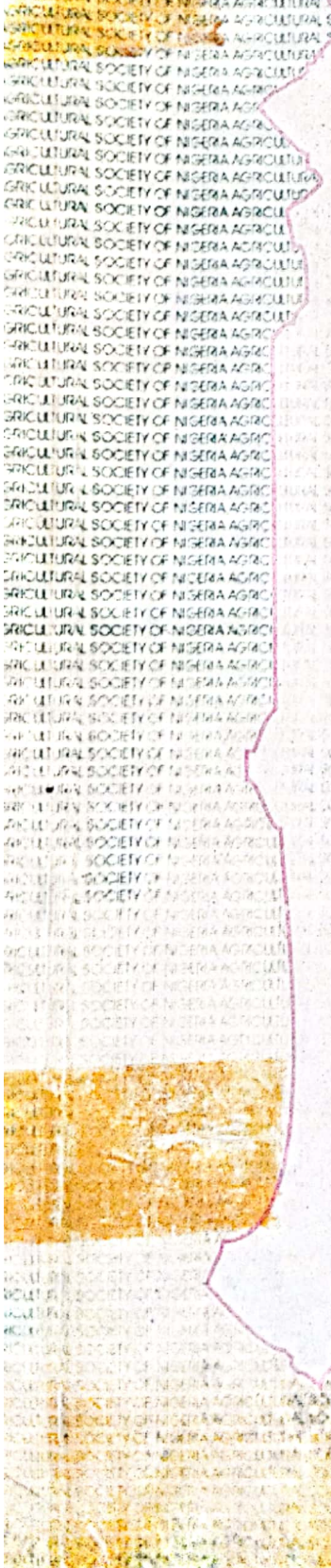


The Role of **AGRICULTURE** *in* **POVERTY** **ALLEVIATION**



Edited by

M. M. Abubakar

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EFFECT OF VARYING REGIMENTS OF EARLY NUTRIENT RESTRICTION ON THE ECONOMICS OF BROILER PRODUCTION

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ABSTRACT

This experiment was carried out to investigate the effect of varying regiments of early nutrient restriction on the economics of broiler production. A total of one hundred and twenty-six (126) Ross broiler day old chicks were raised in an electrically heated battery brooder. Birds in the first treatment, that is the control, were fed a standard starter diet *ad-libitum* formulated to meet all their nutrient requirements. Birds in treatment 2 to 6 were fed a low protein (18%), low energy (ME 2800Kcal/ Kg) diet for 16 days in varying regiments all starting at 7 days of age, alternated by feeding the standard diet during the starter period. Birds were then fed *ad-libitum* to market weight on standard finisher diet. The results revealed that the body weight gain and feed: gain ratios of birds during and after restriction were not significantly affected by varying regiments of early nutrient restriction. It was also observed that the cost: benefit ratio however, all the nutrient restricted birds had lower cost: benefit ratio relative to their control counterparts. It is therefore suggested that nutrient restriction early in life of chicks may offer some economic advantage over feeding regime.

INTRODUCTION

A major cost item in livestock production especially broiler production is feed. Ogundipe (1991) reported that feed cost constitutes about 60-70% of the total cost of poultry production depending on the type of operation. Any attempt to increase profit in broiler production must therefore strive to minimise feed cost.

Various methods have been employed through research to reduce the cost of production in the poultry industry. Among these methods are feed restriction and compensatory growth programmes. Feed restriction could either be quantitative or qualitative. Quantitative feed restriction can be achieved by reducing the quantity of feed made available to the birds while qualitative feed restriction can be achieved by lowering the level of one or more essential nutrient from the diet. In either case, feed restriction not only reduces production cost, but also, it is a means of achieving compensatory growth, improve utilization of ingested food and in addition produces a leaner meat (Szepesi, 1980).

It may therefore be hypothesized that early nutrient restriction may cause broiler to lose little or no body weight or even gain some weight during the restriction periods. This may offer some economic advantage over a continuous *ad-libitum* feeding regimen. This study was conducted to test this hypothesis.

More specifically, the study sought to examine the effect of varying regiments of early nutrient restriction on body weight gain, feed: gain ratio and the economic benefits derivable from early nutrient restriction.

MATERIALS AND METHODS

A total of 126 Ross broiler day old chicks were raised in an electrically heated battery brooder. All birds were fed *ad-libitum* to 7 days of age using the control starter diet (Diet 1, Table 1). The chicks were randomly distributed to six dietary treatments, each with three cages of 7 chicks in a completely randomised design. Control birds were fed diet 1 *ad-libitum* throughout the starter period. Also during the starter period, birds in treatments 2 to 6 were fed diet 2 which was a low protein (18%CP), low energy (2,800kcal/kg ME) diet, (Table 1), for 16 days in varying regimens, all starting at 7 days of age, alternated by feeding the standard starter diet which was diet 1.

In treatment 2, birds received diet 2 for 16 days followed by diet 1 to 35 days of age. In treatment 3, birds were fed diet 2 for 8 days, then diet 1 for another 8 days, and diet 2 for a further 8 days followed by diet 1 to 35 days of age. Birds in treatment 4 received diets 2, 1 and 2 for 8, 4 and 8 days respectively, followed by diet 1 days to 35 days of age. For birds in treatment 5, diets 2 and 1 were alternated every 4 days such that birds had 16 days of diet 2. Birds in treatment 6, were fed diets 2, 1 and 2 for 4, 2 and 4 days respectively, such that birds had 16 days of diet 2. All birds were then offered a standard finisher diet, which was diet 3 (Table 1) from day 35 to the end of the experiment at 63 days of age. Feed intake and body weight gain of birds were determined on weekly basis throughout the period of the experiment.

All the data obtained were subjected to the analysis of variance (Steel and Torrie, 1980). When analysis of variance indicated a significant treatment effect, means were separated using the Duncan's multiple range test (Duncan, 1955).

Table 1: Percentage Composition Of Experimental Diets

Ingredients	Starter %		Finisher %
	Diet 1	Diet 2	Diet 3
Maize	42.03	42.00	60.00
Soyabean meal	29.81	15.47	17.47
Brewers dried grain	10.00	16.22	6.27
Maize milling waste	8.00	12.45	10.45
Blood meal	3.03	3.00	2.94
Palm oil	3.58	3.44	—
Bone meal	2.69	2.95	1.94
Oyster shell	0.26	0.25	0.33
Salt	0.25	0.25	0.25
Min/Vit Premix	0.25	0.25	0.25
DL-methionine	0.10	0.10	0.10
Grit	—	3.72	—
Total	100	100	100

RESULTS AND DISCUSSION

Over the period of 7 to 63 days, the nutrient restricted birds maintained better body weight gain compared to the control birds, although not statistically significant. The present results confirm previous observations by Planvik and Hurwitz (1991) who reported that broilers and turkeys subjected to mild nutrient restriction that allowed for only 60-75% of normal growth during the under-nutrition period, showed final body weights that were greater than the control birds. Varying the regiments of early nutrient restriction did not have any significant effect on the feed: gain ratio during and after the restricted period (Table 2). Over the period of 7 to 63 days, treatment 4 birds were observed to have the lowest feed: gain ratio of 2.76 as compared to the control which had 3.03. This difference, was however, not statistically significant. The slight improvement may be due to better nutrient utilization. Similar studies by McMurtry *et al.* (1988) suggested that there was an advantage for early feed restriction in terms of improving feed efficiency with broiler chickens. However, Pinchasov and Jensen (1989), on the other hand, found no significant difference in overall feed efficiency between restricted and full-fed broilers.

Table 3 shows the effect of varying regiments of early nutrient restriction on the economics of broiler production. Observations from the cost-benefit analysis showed a non-significant difference analysis the nutrient restricted birds which had lower cost-benefit ratio when compared to their control counterparts. This effect was however, not statistically significant. The lower cost-benefit ratio observed for birds subjected to early nutrient restriction may be partly attributed to the lower cost incurred on feeds and also to the monetary savings recorded as a result of improved feed efficiency. Similar observation were made by Proudfoot *et al.* (1983).

Table 2: Effect of varying regiments of early nutrient restriction on performance of broilers.

Treatment	Feed Intake g/bird Day (7 to 63)	Weight gain g/bird Day	Feed: gain ratio Day (7 to 63)	Mortality % Day (7 to 63)
1	4,335	1,431	3.03	-
2	4,415	1,594	2.78	-
3	4,444	1,503	2.98	4.76
4	4,461	1,614	2.77	-
5	4,440	1,579	2.83	9.53
6	4,638	1,544	3.03	-
Significance	NS	NS	NS	NS

NS:- Not significant (p>0.05)

Table 3 Effect of varying regiments of early nutrient restriction on the economics of production of broilers.

Economic Level of Parameter significance	Dietary Treatments						
	1	2	3	4	5	6	
Cost of bird (N/bird)	25.00	25.00	25.00	25.00	25.00	25.00	NS
Cost of feed (N/bird)	37.69	37.39	37.34	37.55	37.25	39.01	NS
Cost of feeds NS	62.69	62.39	62.34	62.55	2.25	64.01	
And Birds (N/bird)							
Revenue	150.50	166.57	158.17	167.17	165.30	161.01	NS
Benefit	87.81	104.18	95.83	104.62	103.05	97.00	NS
Cost/Benefit ratio NS	0.71	0.60	0.65	0.60	0.60	0.66	

CONCLUSION

Although the cost-benefit ratios were not significantly affected by varying regiments of early nutrient restriction, all the nutrients restricted birds had lower cost-benefit ratios relative to their control counterparts. It is therefore suggested that nutrient restriction may offer some economic advantage over a continuous *ad-libitum* regiment.

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