ANIMAL AGRICULTURE IN WEST AFRICA: THE SUSTAINABILITY QUESTION

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and the Inaugural Conference of the
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Gateway Hotel, Abeokuta, Nigeria

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CONTENTS

Effect of varying regiments of early nutrient restriction on Abdominal fat of broilers

K.E.[1]Fabiyi, J.O.[2]Atteh and J.O.[2]Oyedeji.

1. Animal production Programme, Abubakar Tafawa Balewa University Bauchi, Nigeria.

2. Department of Animal production, University of Ilorin, Ilorin, Nigeria.

Introduction

Considerable interest was once expressed in a theory that over feeding during infancy was a major cause of obesity in later life. Over feeding in early life enhanced maturation and increase fat cell number (1). Investigation have shown that what and how broilers chicks are fed during the first few days of life may influence the relative deposition of fat at market age in broilers. Hence, early nutrient restriction could be employed as a nutritional means of manipulating fatness of broilers. The present study was carried out to investigate the effect of varying regiments of early nutrient restriction on the abdominal fat of broilers.

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 on the control starter diet(diet1). The chicks were randomly distributed to one of treatments, each with three replicate cages of 7 chicks. Control birds were fed diet 1 ad-libitum through out the starter period. Also during the starter period birds in treatment 2 to 6 were fed a low protein (18%) and low energy diet(ME 2,800 kcal/kg) (diet 2) for 16 days in varying regiments, all starting at 7 days of age, alternated by feeding a standard diet(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, then diet 2 for 8 days followed by diet 1 to 35 days of days of age. Birds in treatment 4 received diet 2, 1 and 2 for 8, 4 and 8 days respectively then diet 1 to 35 days of age. For birds in treatment 5, diet 2 and 1 were alternated every 4 days such that birds had 16 days of diet 2. While birds in treatment 6, were fed diet 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 (diet 3) from day 35 to the end of the experiment. Feed intake and weight gain of birds were determined on weekly basis throughout the period of the experiment.

At the end of the experiment, 3 birds were randomly selected from each replicate and sacrificed to determine abdominal fat weight and carcass weight. The adipose tissue surrounding the gizzard, intestine, extending within the ischium and surrounding the cloaca, bursa of fabricius and adjacent abdominal muscle were collected and weighed as abdominal fat. The completely randomized design was used in the analysis of all data.

Result and Discussion

As shown in table 1, the control birds had the highest abdominal fat compared to the nutrient restricted birds(treatment 2 to 6) although the effect was not statistically significant ($p>0.05$). Birds in treatment 4, which were fed diet 2,1 and 2 for 8,4 and 8 days respectively until 16 days of feeding diet 2 was achieved, had the lowest abdominal fat as a percentage of

Carcass weight, (2.10) While their control counterparts had (3.20) abdominal fat as a percentage of carcass weight, however this difference was not significant statistically($p > 0.05$). Similar findings were obtained by (4) and it also agrees with the work done by (3), they observed that lowering the calorie:protein ratio tended to reduce abdominal fat, but not significantly.

Success of early life nutrient restriction in producing decrease in body fat was associated to negative energy balance achieved during the restriction phase(2) indicated that early life nutrient restriction may limit adipocyte hyperplasia.

The effect of varying regiments of early nutrient restriction not being significant may be associated with the fact that the restriction embarked on was rather mild.

Table 1. Effect of varying regiments of early nutrient restriction on abdominal fat of broilers.

Treatments	Carcass weight (g)	Abdominal fat weight (g)	% of carcass
1	1,183	38.0	3.20
2	1,210	30.5	2.50
3	1,097	29.6	2.67
4	1,193	25.8	2.10
5	910	28.3	3.07
6	1,170	34.2	2.90
Significance	NS	NS	NS
SEM	± 116.83	± 6.90	±0.17

SEM Standard error of mean
NS Not significant($p > 0.05$)

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