European Journal of Agriculture and Forestry Research
Vol.2, No.4, pp.68-73, December 2014
Published by European Centre for Research Training and Development UK (www.eajournals.org)

EVALUATING GENETIC PARAMETERS OF COCKERELS OFFERED GRADED LEVELS OF SUNFLOWER AND BEEF TALLOW OILS.

Kperegbeyi J.I[1] and Otoikhian C.S.O[2]
[1]School of Agriculture, Department of Agricultural Technology, Delta State Polytechnic, Ozoro.
[2]Faculty of Agriculture, Department of Animal Science, Ambrose Ali University, Ekpoma.

ABSTRACT: *The effect of sunflower oil and beef tallow, on performance of cockerels was studied. One hundred and twenty (120) day-old Anak cockerel chicks were randomly and equally allotted to six treatment groups, (Diet I - Control,) (Diet 2- SO 3.0%), (Diet 3 - SO 6.0%); (Diet 4 -BT3.0%), (Diet 5-BT 6.0%) and (Diet 6-SO 3.% and BT 3.0%), replicated twice with 20 birds each in a completely randomized design (CRD) for 91 days. The results showed that body weight gain and feed -to-gain ratio for all the treatments were significantly (P < 0.05) influenced. Birds fed diet 3 had the highest weight gain (1377.30g) followed by 5 bird fed diet 5 while birds fed diets 1,4 and 6 respectively had their weight depressed. Birds fed diet 6 gave the best feed-to- gain ratio (4.38). The feed cost per kilogramme diet significantly (P < 0.05) increased with the increasing oil proportion inclusion. Diet 1 (control) gave the least cost per kg weight gain (₦158.88) and the lowest accruable. Revenue (₦425.56). From the results of this study, it world appear that birds fed diet 6 attain early sexual maturity and better body conformation.*

KEYWORDS*:* Conformation, sexual maturity, performance, beef tallow, sunflower oil, Anak cockerel.

INTRODUCTION

There has been an increased interest in recent years of using animal or vegetable fats as supplemental fat to animal diets to improve the absorption of fat-soluble vitamins, decrease pulverulence, increase diet palatability, and the efficiency of utilizing consumed energy by growing cockerels. Olomu (1995) stated that fats which replaced carbohydrate energy in poultry, improved feed efficiency and growth. He further stated that the substitution of fat for a portion of the dietary carbohydrates may increase energy utilization by reducing heat increment of view sunflower oil and beef tallow have similar effects. They digester in the gastro-intestinal absorption of all nutrients present that diets with similar nutritive value, chickens fed rations containing oil of any kind showed better performance than birds fed diets without oil inclusion.

It is expected that as the demand for animal products increases with increasing population and improvement in living standards, feds tuffs without inclusion of fat and oil in the diet will likely be insufficient to sustain poultry production. Therefore more reliance on the use of oil or fat in diets will likely be insufficient to sustain poultry production. Therefore more reliance on the use of oil or fat in diets for growing cockerels may improve their general performance. Therefore, this study reports the dietary inclusion of these fat ingredients on the performance of growing cockerels in a research on- farm condition in Niger Delta environment.

ISSN 2054-6319 (Print), ISSN 2054-6327(online)

MATERIALS AND METHODS

Sources of oil and fat

Sunflower oil used in thus study was obtained from Zoro supermarket in Benin-City. While Beef tallow was obtained from Ozoro and Owhelogbo abattoirs in Delta State. The beef tallow was placed into a fluid pan at a melting temperature for 5 to 10 minutes. TBHQ (tert-butv hydroxyquinone) a synthetic antioxidant was added to stabilize the fat.

Experimental Site

The experiment was conducted at the Delta State Polytechnic research farm, Ozoro. The farm is located within the polytechnic which is in latitude $5°30^1$ and $5°45^1$ N and longitude $5°40^1$ and 6°E of the Greenwich meridian. Environmental temperature range from 25°C to 29.5°C with average animal rainfall of 2700 mm.

Housing and Management of Birds

One hundred and twenty (120) Anak cockerel chicks were used for this experiment. The chicks were brooded and management on deep litter in an open-sided poultry house in pens separated by wooden partitions, each measuring $1.75m^2$. During the brooding period each pen were provided with four 200-watt electric bulbs to provide an optionum temperature. The birds were vaccinated according to recommended schedule.

Experimental Design

At the commencement of the experiment the birds were weighed and randomly allotted to 6 treatment groups (on equal weight basis) of 20 replicates each. Each bird constituted a replicate. Feed and water were supplied *ad-libitum*.

Experimental Diets

Six experimental diets were formulated using sunflower oil (SO) and beef tallow (BT). Such that diets] contained no oil, diets 2 and 3 contained SO at 3.0 % 6.0 %, diets 4 and 5 had BT at 3.0 % and 6.0 %, while diet 6 contained 3.0% of SO and BT respectively. The diets were fed to grower cockerels (3 weeks of age) The diets was formulated to contain 17 % crude protein (CP) and this level was maintained all through the research work. The percentage composition of the experimental diets are shown in Table 1

Data Collection

The birds were weighed and feed intake was recorded weekly samples of feed were analyzed for proximate composition using A.O.A.C. (1990) methods. Chicks were observed daily and a record of mortality was kept Range Test (steel and Tome 1980) at 5 % level of significant.

ISSN 2054-6319 (Print), ISSN 2054-6327(online)

RESULTS AND DISCUSSION

The effects of dietary inclusion of sunflower oil and beef tallow on performance of growing Anak cockerels are presented in table 2. Performance parameters were evaluated in cockerels fed different dipodic source (sunflower oil, beef fallow and mixtures). There were significant (P>0.05) difference in feed intake, weigh gain and feed/gain and body weight when sunflower oil and beef fallow were used. However, the reduction in feed intake by cockerels fed the oils at 6% could be related to increase in energy density due to oil inclusion (Odunsi and onifade, 1998 and Panja *et al.*, 1995). This effect is irrespective of whether the oil fee was sunflower oil or beef tallow Dietary inclusion of oil at 6% also resulted in a better feed/gain than for cockerels on 3% thus supporting the view of Adeyemi (1998) that oils generally improved feed conversion ratio. The diets containing 3 % SO and 3 % Bt resulted in higher feed intake and feed/gain but lower weigh gain when compared to the other diets. Evaluating the effects of the mixtures of vegetable and animal fats (sunflower oil and beef tallow) on the proportions of 3% each in the alimentation of cockerels, the result revealed that birds fed with 6% oils were significantly heavier than birds non-supplemented with fat. Weigh gain feed intake and feed conversion of cockerels fed with diets containing 3 % SO,, 3 % BT; 6 % SO; 6 % BT and mixture of 3 % SO and 3 % BT were not affected by oil sources. However, there was an increase ii weight when the mixture was used. The result showed the feed cost per kilogramme diet (table 3) to significantly (P. 0.05) increase as the diet increases. This could be attributed to the high cost of sunflower oil with the relatively cheaper beef tallow. Diet 6 gave the highest cost per kg- weight gain (₦251.73), follows by diets 3 (₦244.79), 5 (₦239.27), 2 (₦227.64) and 4 (₦205.66) respectively. The revenue realized was highest for diet 3 (₦778.60) while diet 1 gave the least value (₦425.56) diet 3 also gave the highest gross margin (₦575.93) while diet I gave the least value (₦266.68). The result of this study showed that when up 6 % sunflower oil was used in the diets for cockerels, the performance and economic parameters considered were better than the other diets including the control diet (Diet I). With this level of inclusion more costly sunflower oil can be reduced this reducing cost of production. Table 4 Shows that grower cockerels fed 01 the diet containing 6 % sunflower oil develop comb earlier (71 days) than others with a delay of 18 days per 0 % fed birds without oil, and 4,5 and 6 days for the diet containing both oils, 3 % sunflower oil, and 3 % bee tallow respectively. Age at first crow was delayed irrespective of oil types fed except diet 6. The type of die fed during rearing phase not why influences age at sexual maturity but also bird performance in sexual maturity. Daily weight gain during the growing phase had a noticeable trend with early signs of sexual maturity (Table 2) cockerels with the highest gain became matured roaster irrespective of oil source (SO and BT) fed. For instance, 6.0 % SO fed birds had daily gain of 16.79 g and matured by 82 days while 3.0 % SO had 15.63 g and attained maturity by 86 days. Conversely, those in 3 % BT and 6.0% BT diets gained 14.51 and 15.67 g daily but attained its first crow. By 84 and 89 days respectively. Those fed both oils had the lest value of 12.35 g and crow latest 90 days. This close trend of cockerel weight gain may come into maturity early, often due to raster rate of growth. Furthermore, feed intake during the growing phase did not show any relationship with sexual maturity correlates with sexual maturity (Callson and Nelson, 1981) in this study, it was observed that dietary 1981 factors apart from quantity ingested influenced maturity. Higher levels of SO promoted early attainment of sexual maturity while the reverse was the case with BT. An evaluation of oil compositional differences might therefore provide some information in this regard. The growth response of cockerels reveals that.BT is equally tolerated

ISSN 2054-6319 (Print), ISSN 2054-6327(online)

as SO even at 6%. Feed intake was not adversely influenced, preliminary in BT unlike that reported by Fajimi *et al.*, (1993) with rubber seed oil, and Adeyemi (1998) with thevetia oil.

CONCLUSION AND RECOMMENDATION

This present study reveals that there is need to include different oil sources in the diet of cockerels if interest is on early sexual maturity and better body conformation which has been revealed to be correlated. It is also advisable to include mixture of these oil sources since digestibility of various oils differs. Based on the findings of this present work up to 3 % inclusion of SO and BT oils is recommended for cockerels in Niger Delta environment.

TABLE 1: PERCENTAGE COMPOSITION OF EXPERIMENTAL DIETS (3-13 WEEKS)

Ingredients	Diet 1	Diet 2	Diet 3	Diet 4	Diet 5	Diet 6
Maize	66.65	66.65	63.65	66.65	63.65	63.65
Soyabean Meal	16.00	16.00	16.00	16.00	16.00	16.00
Palm Kennel Meal	12.00	9.00	9.00	9.00	9.00	9.00
Sunflower oil	-	3.00	6.00	-		3.00
Beef Tallow-	-	-	-	3.00	6.00	3.00
Fish Meal	3.00	3.00	3.00	3.00	3.00	3.00
Bone Meal	1.50	1.50	1.50	1.50	1.50	1.50
Common Salt	0.35	0.35	0.35	0.35	0.35	0.35
P remix	0.50	0.50	0.50	0.50	0.50	0.50
Total	100.00	100.00	100.00	100.00	100.00	100.00
Calculated Composition						
Crude Protein %	17.99	17.36	17.09	17.09	17.09	17.09
Me (Kcal / Kg)	3119	3041	2936	2936	2936	2936
Meth.t Cyst (%)	0.54	0.58	0.57	0.58	0.57	0.57
Lysine (%)	0.79	1.00	0.98	1.00	0.98	0.98
Calcium (%)	0.71	0.67	0.67	0.67	0.67	0.67
Total Phosphorus(%)	0.57	0.63	0.63	0.63	0.63	0.63
Available Phos. (%)	0.38	0.44	0.40	0.44	0.40	0.40

Supplies per kg diet :A, 8000 1 V; Vit.D3, 16001.U, Vit. K, 2mg; Vit. C. lOmg; Vit B2 3mg; calcium, pantothenate, 45mg , Vit B, 9mg; Vit. B6 1 mg; Vit. B12 O.OOSmg; folic acid. 0.5mg; manganese, 70mg; zinc, 50mg; iron, 20mg; Copper, 3mg; iodine 1 mg; Cobalt. 0.2mg; Selenium, O.lmg; anti-oxidant, 0.lg; Chlorine chloride, 0.2g, anti-mould, 15mg and growth promoter, 20mg.

ISSN 2054-6319 (Print), ISSN 2054-6327(online)

Diet 1 (control) - 0% of oils
Diet 2 - 3.0% Sunflower oil
Diet 3 - 6.0% Sunflower oil
Diet 4 - 3.0% Beef tallow
Diet 5 - 6.0% Beef tallow
Diet 6 - 3.0% Sunflower oil and 3.0% beef tallow

TABLE 2: EFFECT OF TWO LEVELS OF SUNFLOWER OIL AND BEEF TALLOW ON PERFORMANCE OF GROWER COCKERELS (3-13 WEEKS)

Parameters	Diet 1 Control 3.0 %	Diet 2 SO 6.0 %	Diet 3 SO 3.0 %	Diet 4 BT 6.0 %	Diet 5 BT 3.0 %	Diet SO 3.0 %	SEM
Initial body wt. (g)	344.80^{c}	352.90^{b}	352.70^{b}	327.75^{d}	330.22^{d}	365.25^{a}	10.02
Final body wt. (g)	1456.00^{d}	1697.00^{b}	1730.00^{a}	1547.00^{c}	1725.00^{a}	1367.70^{c}	78.62
Body wt gain (g)	1111.20^{d}	1344.10^{b}	1377.30^{a}	1219.25^{c}	1394.78^{a}	1002.00^{c}	0.95
Feed/gain ratio	3.99^{b}	3.64^{c}	3.29^{d}	3.93^{b}	3.23^{d}	4.38^{a}	0.46

Mean in a row with different superscripts are significantly different (P<0.05)

TABLE 3: ECONOMIC OF DIETARY INCLUSION OF SUNFLOWER OIL AND BEEF TALLOW ON GROWTH AND SEXUAL MATURITY OF GROWTH, COCKERELS.

Parameters	Diet 1 Control	Diet 2 SO 3.0 %	Diet 3 SO 60 %	Diet 4 BT 3.0 %	Diet 5 BT 6.0 %	Diet SO 3.0 % BT 3.0 %	SEM
Cost per kg feed (₦)	50.12^{d}	68.87	69.74^{a}	59.96^{c}	62.21^{b}	53.56^{d}	0.08
Cost per kg weight gain (₦)	158.88^{c}	221.76^{c}	44.79^{ba}	205.66^{d}	239.27^{b}	251.73^{a}	13.68
Cost of production (₦)	158.88^{d}	301.80^{a}	202.67^{c}	195.73^{c}	200.92^{c}	215.00^{b}	46.31
Revenue (₦)	425.56	638.95	778.60	556.58	634.78	578.83	41.68

Mean in a row with different superscripts are significantly different (P<0.05) ₦120.00

TABLE 4: SEXUAL MATURITY AND GROWTH CHARACTERISTICS OF COCKERELS DURING THE LAST FOUR WEEKS OF THE EXPERIMENT

Signs of Sexual maturity	Diet 1 Control	Diet 2 SO 3.0%	Diet 3 SO 60%	Diet 4 BT 3.0%	Diet 5 BT 6.0%	Diet SO 3.0% BT 3.0%
Comb	89^{a}	76^{a}	71^{c}	77^{b}	73^{b}	75^{b}
Wattle	84^{a}	78^{b}	74^{c}	80^{b}	79^{b}	77^{c}
Age at first cow	-	86^{b}	82^{c}	84^{b}	89^{a}	80^{c}

Mean in a row with different superscripts are significantly different (P<0.05)

ISSN 2054-6319 (Print), ISSN 2054-6327(online)

REFERENCES

Adeyemi, O.A. (1998). Response of fishing broilers to graded levels of heat treated solvent extracted thevetia oil. Nig. J. Anim. Prod. 25: 134-138.

Association of Official Analytical Chemists (A.O.A.C), 1990. Official methods of analysis, 14th edition, Washington DC USA.

Carlson, C.W. and Nelson, R.A. (1981). Grower diets and their effects upon subsequent performance of layer type pullets point Sci. 60:1272-1281.

Moura BHS. Desempenho ecomposicao da carcaca de frangos de corte alimentados com differentesniveis energeticons com e sem oleo (dissertacao). Belo Horizonte: escola de Veterinaria, UFMG, 2003.

Odunsi, A.A. and Onifade, A.A. (1998): Effect of Zinc Bacitracin supplementation of broiler chick diets containing a low or high vegetable oil concentration the tropics. Trop. Vet. 16:51-57.

Olomu, J.M (1995). Monogastric Animal: Nutrition-principles and practice. A Jachem Publication Benin, Nigeria – pp320.

Panja, P. Kassim, A and Jalaludin, S. (1995): Effects of palm oil and soyabean oil as fat sources in is nitrogenous and is caloric diets on the performance of broilers. Asian Australian *Journal of Anim. Sc. 8:223-229.*

Steel, R.G.D and Torrie, J.H. (1980): Principle and procedures of Statistics. A biometrical approach 3rd ed. Mc Graw-Hill Book Co. Inc. New York.

ISSN 2054-6319 (Print), ISSN 2054-6327(online)