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# Performance of broiler with feeding different levels of palm oil

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## Abstract

Six hundred day-old unsexed broiler chicks were used in a 42-day trial to compare the effects of different levels of palm oil supplementation on feed intake, weight gain, feed conversion and carcass quality of broilers. The chicks were randomly distributed following a completely randomized design in four treatment groups having three replications per treatment. Each treatment had 150 broilers with 50 broilers per replicate. Four diets were formulated using locally available ingredients as diet without oil, diets containing 2.5%, 3.0% and 3.5% palm oil. All broilers had free access to *ad libitum* feeding. Results indicated that, supplementation of diets with different levels of palm oil significantly ($p<0.05$) influenced feed intake of broiler only at the age of 6$^{th}$ week. It was observed that as the level of supplementation increased, feed intake gradually decreased up to 6$^{th}$ week. Supplementation of diets with different levels of palm oil increased live weight gain of broilers. Differences ($p<0.01$) were observed at the end of 4$^{th}$, 5$^{th}$ and 6$^{th}$ weeks of age only. Use of different levels of palm oil significantly ($p<0.05$) changed blood weight, heart weight and dressed weight. Survivability of broilers was higher in the supplemented group compared with without oil group. It was concluded that, supplementation of palm oil at 3.5% level in the diet of broilers resulted higher weight gain, better feed conversion and improved carcass characteristics comparing other levels. It may be concluded that supplementation of palm oil at 3.5% level in the diet of broilers resulted significantly ($p>0.05$) higher feed conversion ratio compared to 2.5% and 3.0% levels.

**Key words:** Broiler, carcass quality, feed intake and conversion, palm oil, weight gain

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## Introduction

There is increasing interest to replace animal fats by vegetable fat sources in the diet for broilers. Animal fats such as tallow and lard are rich in long-chain saturated fatty acids. Most vegetable fat sources have a high content of unsaturated fatty acids. The use of unsaturated dietary fats decreases the melting point of the fat in the broiler carcass (Bavelaar and Beynen, 2003). Palm oil is of vegetable origin but rich in the saturated fatty acid palmitic acid (C16:0); the content is about 45% of the total fatty acids. The use of palm oil in broiler diets is attractive, because it is a saturated source that may be associated with a positive influence on meat firmness (Renner and Hill, 1961). Early work on use of fat in poultry rations generally indicated a higher ME value for unsaturated vegetable oils when compared to animal products or products with high free fatty acid content (Waldroup et al. 1995). However, experiments indicated the differences in performance parameters of broilers when feeding with different fat sources (Fuller and Rendson 1979; Pesti et al. 2002; Quart et al. 1992). Palm oil is relatively cheaper compared to imported fats and it possesses many good qualities such as a high level of saturated fatty acids as well as vitamin E (antioxidant agent), which make it more stable. Palm oil is an edible vegetable oil derived from the fruit of the *Arecaceae elaeis* oil palm tree. It may have now surpassed soybean oil as the most widely produced vegetable oil in the world. It is cheaper than soybean oil which is too expensive now-a-days. So the use of palm oil instead of soybean oil might decrease the cost of broiler production. Although much work has been done on the utilization of animal and vegetable fats, reports on the use of palm oil in the poultry feed are limited. Very little information is available on the use of palm oil as a source of energy for

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improving performance of broilers and whether or not can be used more beneficially than other source of energy. Moreover, appropriate dose of palm oil in broiler diet is not known in our country. Therefore, the aim of this study was to find out suitable level of palm oil as supplement to diet for best performances of broilers in terms of feed intake, feed conversion efficiency, growth and carcass quality.

## Materials and methods

The study was carried out in the Department of Animal Science and Nutrition at Chittagong Veterinary and Animal Sciences University Poultry Farm, Chittagong, Bangladesh. The current study was carried out during June to August, 2012.

Six hundred day old, unsexed, Hubbard Classic broiler chicks were used for the study purpose. Initial body weight of a broilers was 40.3 g. A bamboo house was constructed for rearing broiler. The house was covered with corrugated sheet. The house was bamboo stilted type. The floor of the house was ninety centimeter above the ground. Forty five centimeter of the sidewall of the house from floor was made of bamboo and the remaining portion was made of wire net to facilitate proper ventilation. The floor of the house was made of bamboo splits on which fresh dry rice husk was used as litter material at a depth of 4.5 cm. Old litter materials were removed from the pen and new litter was replaced twice a week. Arrangement of floor for rearing broilers was made according to treatments and replications. Compartments were selected for treatment in an unbiased way. The floor of the house was divided by wire net into 12 compartments to maintain desired replication. Broilers were brooded under single-tired electric brooder at $95^0$ F, $90^0$ F, $85^0$ F and $80^0$ F for the $1^{st}$, $2^{nd}$, $3^{rd}$ and $4^{th}$ week respectively by enclosing the compartments with chick guard. The broilers were exposed to continuous lighting. Room temperature and humidity was maintained using 200 watt incandescent lamps and exhaust fans.

Experimental diets were dry mash. Ground feed ingredients, vitamin mineral premix and feed additives used in the ration (Table 1) were purchased from a local market. The diets were prepared by hand mixing. At first, major ingredients were thoroughly mixed then micro-ingredients were added. Broilers had unrestricted access to feed and water. Feed and water were supplied to the broilers by plastic hanging feeder and bell type drinker. Four rations designated as $T_0$, $T_1$, $T_2$ and $T_3$ were formulated where $T_1$, $T_2$ and $T_3$ was supplemented with 2.5%, 3.0% and 3.5% palm oil and $T_0$ was a control group. Theses rations were supplied to four groups of broilers randomly. Detailed proportion of the feed ingredients in different rations is given in Table 1. Nutrient density in the experimental diet was maintained according to Renner and Hill (1961). Formulated diets were analyzed as per AOAC (2003). The starter diet was fed for the first two weeks and the finisher diet was fed for the remaining periods.

The room was fumigated overnight using potassium permanganate and formaldehyde. Feeders and drinkers were cleaned and disinfected with phenyl solution and dried and left for 3 days before arrival of the chicks. Foot bath containing potassium permanganate was placed in front of the shed. The broilers were vaccinated against New castle and Gumboro disease on the $4^{th}$ and $10^{th}$ day followed by a booster dose on 20th and $25^{th}$ day. No outbreak of infectious diseases was found throughout the whole experimental period.

At the end of $5^{th}$ week of the experiment, 25% of the broilers from each replication weighing close to the average of the pen were selected and slaughtered by cervical dislocation for processing. Feeders and drinkers were withdrawn from the pens 4 hours prior to slaughtering to empty the digestive system with less chance of damaging the intestines and contaminating the carcass with fecal materials. Carcass was subjected to dissection following Jones (1984) method. Carcass weight was recorded after removal of feather, feet, head and viscera. Hot carcass weight was recorded immediately after evisceration.

The experiment was carried out following completely randomized design (Gomez and Gomez 1984). Broilers in individual replicate were treated as the experimental unit and diet was treated as the factor. Total 600 broilers were weighed and randomly divided into four treatment groups. Each treatment was divided into three replicates. Each group had 150 broilers

having 50 broilers per replicate. All calculated and recorded data were compiled by using Microsoft excel 2007 and analyzed for ANOVA by using Stata (2009) and SPSS (2007). Means showing significant differences were compared by Duncan's New Multiple Range Test (Duncan, 1955). Statistical significance was accepted at 5% level ($p<0.05$).

## Results and discussion

The response of supplementation of diets with different levels of Palm oil groups on the weight gain of broilers at different ages are presented in Table 2. Irrespective of age, supplementation of diets with different levels of Palm oil groups increased live weight gain of broilers.

**Table 1.** Ingredient composition of diets

| Ingredient[1] | Dietary palm oil (%) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 0% | | 2.5% | | 3.0% | | 3.5% | |
| | Starter | Finisher | Starter | Finisher | Starter | Finisher | Starter | Finisher |
| Maize | 635.00 | 672.50 | 610.00 | 647.50 | 590.00 | 620.00 | 585.00 | 615.00 |
| Rice polish | 23.58 | 13.58 | 23.58 | 13.58 | 33.58 | 31.08 | 23.58 | 23.33 |
| Palm oil | - | - | 25.00 | 25.00 | 30.00 | 30.00 | 35.00 | 35.00 |
| Soybean meal | 270.00 | 250.00 | 270.00 | 250.00 | 285.00 | 265.00 | 315.00 | 287.75 |
| Protein concentrate[2] | 50.00 | 42.50 | 50.00 | 42.50 | 40.00 | 32.50 | 20.00 | 17.50 |
| Lime stone[3] | 9.00 | 9.00 | 9.00 | 9.00 | 9.00 | 9.00 | 9.00 | 9.00 |
| Dicalcium phosphate[4] | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 |
| L-Lysine | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 |
| DL-Methionine | 1.60 | 1.60 | 1.60 | 1.60 | 1.60 | 1.60 | 1.60 | 1.60 |
| Vitamin A (mIU) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Vitamin $D_3$ (mIU) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Vitamin E (g) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Vitamin $K_3$ (g) | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 |
| Vitamin $B_1$ (g) | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 |
| Vitamin $B_2$ (g) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Vitamin $B_6$ (g) | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 |
| Vitamin $B_{12}$ (g) | 0.075 | 0.075 | 0.075 | 0.075 | 0.075 | 0.075 | 0.075 | 0.075 |
| Niacin (g) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Folic acid (g) | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |
| Biotin (g) | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| Iron (g) | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 |
| Zinc (g) | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 |
| Manganese (g) | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 |
| Copper (g) | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 |
| Iodine (g) | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |
| Selenium (g) | 0.075 | 0.075 | 0.075 | 0.075 | 0.075 | 0.075 | 0.075 | 0.075 |
| Antioxidant | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 |
| Coccidiostat | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 |
| Common salt | 2.50 | 2.50 | 2.50 | 2.50 | 2.50 | 2.50 | 2.50 | 2.50 |
| *Calculated values* | | | | | | | | |
| ME (kcal/kg) | 2923 | 2952 | 3023 | 3051 | 3025 | 3050 | 3024 | 3054 |
| CP (g/100g) | 21.27 | 20.15 | 21.04 | 19.91 | 21.05 | 19.95 | 21.03 | 19.92 |
| EE (g/100g) | 3.07 | 3.16 | 5.5 | 5.60 | 6.05 | 6.52 | 6.30 | 6.98 |
| CF (g/100g) | 3.23 | 3.20 | 3.17 | 3.17 | 3.27 | 3.51 | 3.30 | 3.52 |
| Ca (g/100g) | 0.89 | 0.90 | 0.89 | 0.89 | 0.84 | 0.81 | 0.72 | 0.85 |
| P (g/100g) | 0.67 | 0.64 | 0.66 | 0.63 | 0.66 | 0.65 | 0.61 | 0.63 |
| DM (g/100g) | 89.89 | 89.89 | 89.91 | 89.90 | 89.90 | 89.90 | 89.90 | 89.91 |

*[1]Unit=% or otherwise stated; [2]DM=92.5%, ME=2900 kcal/kg DM, CP=60.0%, CF=3.0%, EE=13.0%, Ash=24.0%, Ca=6.5%, P=2.5%, Lysine=7.0%, Methionine=2.0%; [3]DM=98.9%, Ca=35.8%, P=0.02%; [4]DM=98.0%, Ca=24.3%, P=18.2%*

No significant difference ($p>0.05$) was found among the treatment groups up to 3 weeks of age of the broilers. However, significant differences ($p<0.01$) were evident at the end of 4, 5 and 6 weeks of age. At 4 week of age the highest live weight gain was observed 0% level of Palm oil and the lowest weight gain was observed on 3.0%. Among the supplemented groups, 2.5% level showed slightly better results than that of 3.0% level of palm oil. The highest live weight gain was found on 3.0% level Palm oil and the lowest weight gain was found in 2.5% palm oil at 5-weeks of age. Supplementation of groups 3.0% palm oil showed better results than that of 2.5% and 3.5%. At the end of 6 week of age, the highest weight gain was found in 2.5% level of Palm oil and the lowest weight gain was observed in 3.5% level. Supplementation of 2.5% palm oil showed better results than that on 0%, 3.0% and 3.5% level of palm oil. The result revealed that live weight gain of broilers up to 3 weeks of age, did not differed significantly among treatments indicating that at early age supplementation of palm oil at different levels did not affect weight gain in the supplemented groups compared to that of control group. However, at later stage of growth, particularly at the market age (4, 5 and 6 weeks) palm oil supplementation ($p<0.01$) increased live weight gain of broilers. At market age, particularly 5 weeks of age, 3.0% palm oil supplementation gave the highest growth and 2.5% palm oil supplementation gave the lowest growth. Cumulative weight gain at 4 weeks was significantly different among the groups and most interestingly the weight gain was the highest in control group. The results of weight gain of this experiment coincides with Panja (1996), Reginatto et al. (2000), Anigbosgu (2001) and Nwoche et al. (2003) reported that inclusion of Palm oil in broiler diet improved weight gain but contradict with Zulkifli et al. (2003) who fed broilers with a diet supplemented with high levels of Palm oil replacing maize and found no significant effect on growth performance.

The cumulative live weight gain of broilers supplemented with 2.5, 3.0 and 3.5% palm oil is presented in Table 2. Supplementation gave rise to ($p<0.01$) different live weight gain of broilers at 4 weeks. However at 5 and 6 weeks of age the broilers did not show any effect of palm oil supplementation at different levels ($p>0.05$). At the age of 4 weeks the highest cumulative live weight gain was found in control group and the lowest value was found in 3.0% oil group. The highest weight gain was recorded in 2.5% level of palm oil group and the lowest in 3.0% palm oil. At 5 and 6 weeks of age the highest cumulative live weight gain was found in 3.5, and 2.5% level of palm oil group of broilers respectively and the lowest was in 2.5 and 3.5% level of palm oil group. It can also be noticed that 3.0% and 3.5% palm oil group showed higher weight at marked age 5 weeks.

**Table 2.** Live weight gain (g/bird) of broilers receiving different levels of palm oil

| Age (Weeks) | Dietary palm oil (%) | | | | Sig. |
|---|---|---|---|---|---|
| | 0% | 2.5% | 3.0% | 3.5% | |
| 1 | 79.34 | 84.78 | 85.91 | 82.45 | NS |
| 2 | 212.13 | 219.99 | 208.49 | 215.20 | NS |
| 3 | 336.05 | 317.08 | 321.30 | 333.54 | NS |
| 4 | 413.03$^{a}$ | 391.56$^{a}$ | 332.24$^{b}$ | 370.08$^{ab}$ | ** |
| 5 | 319.17$^{b}$ | 308.13$^{b}$ | 413.77$^{a}$ | 381.92$^{a}$ | ** |
| 6 | 339.79$^{b}$ | 387.86$^{a}$ | 323.50$^{b}$ | 262.85$^{c}$ | ** |
| Cumulative weight gain | | | | | |
| 1 to 4 | 1040.55$^{a}$ | 1013.41$^{a}$ | 947.93$^{bc}$ | 1001.25$^{ac}$ | ** |
| 1 to 5 | 1359.72 | 1321.53 | 1361.70 | 1383.17 | NS |
| 1 to 6 | 1699.44 | 1709.39 | 1685.21 | 1646.02 | NS |

*Means having different superscripts in the same row differed significantly; NS, non-significant; **, $p<0.01$*

Supplementation of diets with different levels of palm oils on feed intakes of broilers at different ages is presented in Table 3. The results showed that at 1, 2, 3, 4 and 5 weeks of age. There were no significant variations in feed intake among the groups. However, at the age of 42 days, feed intake significantly ($p<0.05$) decreased for supplementation of their diets with different levels of palm oil. The cumulative feed intake of broilers at different ages of growth in different levels of Palm oil dietary groups was presented in Table 3. At all stages of growth the cumulative feed intake of broilers of supplemented groups was lower than that of un-supplemented without oil group. Feed intakes for the whole the periods in 3.5% level of Palm oil diet were the lowest than the other treatments. This was probably due to increase energy in the diet with supplemented palm oil group of broilers. This results was supported by Franco et al. (1995) and Tawfic and Yo (1989). This result is in agreement with reports of Lopez-Ferrer et al. (2001) and Chashnidel et al. (2010).

**Table 3.** Feed intake (g/bird) of broiler receiving different levels of palm oil

| Age (Week) | Dietary palm oil (%) | | | | Sig. |
|---|---|---|---|---|---|
| | 0% | 2.5% | 3.0% | 3.5% | |
| 1 | 115.03 | 107.44 | 115.59 | 113.01 | NS |
| 2 | 451.41 | 445.93 | 448.18 | 441.51 | NS |
| 3 | 732.90 | 731.75 | 693.48 | 690.10 | NS |
| 4 | 810.56 | 817.62 | 818.35 | 794.19 | NS |
| 5 | 955.90 | 959.58 | 938.86 | 927.39 | NS |
| 6 | 1175.74$^{a}$ | 1168.84$^{ab}$ | 1126.90$^{ab}$ | 1106.91$^{b}$ | * |
| Cumulative feed intake | | | | | |
| 1 to 4 | 2109.88 | 2102.73 | 2075.60 | 2038.82 | NS |
| 1 to 5 | 3065.77 | 3062.32 | 3014.47 | 2966.21 | NS |
| 1 to 6 | 4241.52 | 4231.16 | 4141.36 | 4073.12 | NS |

*Means having different superscripts in the same row differed significantly; NS, non-significant (p>0.05); *, p<0.05*

The feed conversion and the cumulative feed conversion ratio of broilers during different stages of growth under different dietary level of palm oil are given in Table 4. There was no significant (p>0.05) effect of different levels of palm oil supplementation in the diets of broilers on feed conversion up to 3 weeks of age.

**Table 4.** Feed conversion of broilers receiving different dietary levels of palm oil

| Age (Week) | Dietary palm oil (%) | | | | Sig. |
|---|---|---|---|---|---|
| | 0% | 2.5% | 3.0% | 3.5% | |
| 1 | 1.45 | 1.27 | 1.34 | 1.37 | NS |
| 2 | 2.00 | 2.02 | 2.15 | 2.05 | NS |
| 3 | 2.18 | 2.31 | 2.14 | 2.06 | NS |
| 4 | 1.96$^{b}$ | 2.09$^{ab}$ | 2.46$^{a}$ | 2.14$^{ab}$ | * |
| 5 | 3.11$^{a}$ | 3.11$^{a}$ | 2.27$^{b}$ | 2.44$^{b}$ | ** |
| 6 | 3.48$^{b}$ | 3.06$^{bc}$ | 3.52$^{b}$ | 4.28$^{a}$ | ** |
| Cumulative feed conversion | | | | | |
| 1 to 4 | 2.00$^{b}$ | 2.08$^{ab}$ | 2.19$^{a}$ | 2.03$^{ab}$ | * |
| 1 to 5 | 2.24$^{a}$ | 2.32$^{a}$ | 2.21$^{ab}$ | 2.14$^{b}$ | * |
| 1 to 6 | 2.48 | 2.48 | 2.46 | 2.48 | NS |

*Means having different superscripts in the same row differed significantly; NS, non-significant (p>0.05); *, p<0.05; **, p<0.01*

At 4, 5 and 6 weeks of growth, it was significantly different among the treatment groups. At 4, 5 and 6 weeks of age the best feed conversion was observed in 3.0, 2.5 and 0% level of Palm oil treatment respectively and the poorest feed conversion was observed at 3.0, 0 and 3.5% palm oil respectively. However at later stages of age of broilers particularly at the market age (4, 5 and 6 weeks), palm oil supplementation significantly (p<0.01) increased feed conversion of broilers. feed conversion improved with increasing dietary oil up to 3.5% Palm oil in broiler diets. Nwoche et al. (2003) found similar results in their experiment.

The feed conversion differed significantly (p<0.05) at 4 and 5 weeks of age. The poorest feed conversion was observed at 2.5% palm oil group. Significantly higher cumulative feed conversion observed in 4 weeks and 5 weeks of age, which indicates that palm oil supplementation resulted in better feed conversion than that of without oil group of broilers and 3.0% level of palm oil group showed the highest cumulative feed conversion than others. However, as the age advanced at 6 weeks cumulative feed conversion did not differ significantly among the treatment groups. Cumulative feed conversion ratio showed an increasing trend with the increase of palm oil level up to 3.5% compared to that of without oil. This result is in agreement with Panja (1996) who reported that the feed conversion appeared to increase with increasing Palm oil content of diets.

**Table 5**. Carcass characteristics of broiler fed palm oil at 5$^{th}$ week of age

| | Dietary palm oil (%) | | | | Sig. |
|---|---|---|---|---|---|
| | 0% | 2.5% | 3.0% | 3.5% | |
| Shank weight | 6.38 | 6.12 | 6.33 | 5.69 | NS |
| Blood weight | 4.53 | 4.26 | 4.38 | 4.31 | NS |
| Feather weight | 3.88$^{b}$ | 4.35$^{ab}$ | 4.68$^{ab}$ | 5.66$^{a}$ | * |
| Drumstick bone weight | 4.75 | 5.20 | 4.26 | 3.94 | NS |
| Thigh bone weight | 2.12 | 2.22 | 2.11 | 2.24 | NS |
| Head weight | 1.37 | 1.44 | 1.50 | 1.41 | NS |
| Heart weight | 2.83 | 2.79 | 2.81 | 2.96 | NS |
| Neck weight | 0.57$^{b}$ | 0.60$^{ab}$ | 0.64$^{a}$ | 0.59$^{ab}$ | * |
| Dressed weight | 58.00$^{a}$ | 56.07$^{a}$ | 56.59$^{a}$ | 52.14$^{b}$ | * |
| Breast meat weight | 12.45 | 11.20 | 10.60 | 13.05 | NS |
| Thigh meat weight | 10.97 | 11.36 | 11.07 | 10.85 | NS |
| Drumstick meat weight | 8.58 | 6.95 | 7.66 | 6.53 | NS |
| Skin weight | 5.99 | 5.73 | 5.57 | 5.23 | NS |
| Abdominal fat weight | 6.74 | 6.96 | 6.98 | 7.17 | NS |
| Digestive tract weight | 13.06 | 12.87 | 11.60 | 15.34 | NS |
| Lung weight | 1.68 | 2.28 | 2.29 | 2.21 | NS |
| Gizzard weight | 2.84 | 2.83 | 3.10 | 3.01 | NS |
| Wing meat weight | 3.41 | 3.60 | 3.31 | 3.73 | NS |

*Means having different superscripts in the same row differ significantly; NS, non-significant (p>0.05); *, p<0.05*

Different meat yield parameters of broilers fed on diets containing different levels of palm oil at 5 week of age are presented in Table 5. Use of different levels of palm oil did not show any significant ($p>0.05$) difference except feather weight, neck weight and dressed weight. The highest percentage of shank weight, blood weight, dressed weight and drumstick meat weight was found in without oil group. The lowest mean value of dressed weight was observed in 3.5% level of palm oil group. The data on meat yield characteristics indicated that the dressed yield decreased due to increasing of Palm oil in the diet of broilers. In the present study, the breast meat yield increased compared to that of without oil group which is in agreement with the findings of Nayebpor et al. (2007). On the other hand, abdominal fat percentage and head weight increased as the level of oil increased which might have reflected the reason of decreasing total meat yield as the percentage of live weight. The result shows that the relative heart weight increased as the level of oil increased. This might be as a result of high fat deposition around the pericardium of the heart which might have implications on the diastolic and systolic system of the heart of the chickens (Agbede and Aletor 1997). Present study also showed that the abdominal fat accumulation increased with the increasing level of oil which agreed with Bobadoye et al. (2006) and suggested that inclusion of Palm oil in the diet of broiler would promote fat deposition in broiler carcass.

## Conclusion

Based on the above findings it may be concluded that supplementation of palm oil at 3.5% level in the diet of broilers resulted in non-significantly higher live weight gain but significantly ($p>0.05$) higher feed conversion ratio compared to those of other levels (2.5 and 3.0%).

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