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# EFFECT OF DIETARY FIBER LEVELS ON BROILER PERFORMANCE AND ECONOMIC EFFICIENCY: 1-WHEAT BRAN

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## SUMMARY

The aim of study was to determine the use of varies levels of wheat bran as dietary fiber source in broiler chicks and its influence on productive performance, nutrient utilization and economic efficacy. The experiment was conduct with 120 broiler chicks; Indian River (IR) located in cages (10 chicks\cage). The chicks were randomly assigned four treatments (control and $T_{1-3}$), each with 30 chicks (3 replicates/10 chicks) control 0 %, $T_1$ 5%, $T_2$ 7.5% and $T_3$ 10% wheat bran as dietary fiber (9.07%), and during the period of 35 days of age. Feed and water provided each for *ad libitum* consumption. All diets contained a balance concentration of 23% crude protein in starter (1-21 days) and 21% in grower diets (22-35 days) of age.

The results of this study indicated that, an inclusion rate up to a level of 10% wheat bran in broiler diets was without negative effects in live body weight, body wight gain, feed consumption, feed conversion ratio, calorie conversion ratio and protein conversion ratio. Relative economic efficacy value was improved by 25% $T_1$, 24% $T_2$ and 20% $T_3$ respectively, compared to control group. It can be conducted that, using wheat bran as dietary fiber up to levels of 10% in broiler diets can improved economic efficiency without negative effects on overall performance.

***Keywords:*** *Performance, economic efficiency, broilers, fiber and wheat bran.*

## INTRODUCTION

Fiber is a naturally occurring element of feedstuff obtained from plants and is crucial to chicken feed. Studies and experiments carried out in previous years have indicated unfavorable influences regarding the daily intake, growth performance, and digestibility of nutrients (Jorgensen *et al.*, 1996; and Sklan *et al.*, 2003). Dietary fibers are found in plant cell walls and are predominantly made up of lignin and non-starch polysaccharides. Water-soluble and insoluble dietary fibers (IDF) are the two categories into which they fall (Owusu-Asiedu *et al.*, 2006; and Tellez *et al.*, 2014).

The structure of soluble dietary fiber (SDF) is typically viscous, which increases digesta viscosity, decreases transit rate, and ultimately decreases nutrient utilization (Jha and Berrocoso, 2015). Contrarily, IDF has a non-viscous structural component, and recent research in chicken has shown that moderate doses (2-3%) of IDF improve gastrointestinal growth and enzyme secretion, which in turn improves nutrient utilization (Jha *et al.*, 2015; and Mateos *et al.*, 2012). Adding insoluble dietary fiber supplements to broiler diets may therefore be a workable way to increase feed efficiency. According to research by Gonzalez-Alvarado *et al.* (2007) insoluble fiber sources such as rice hulls, oat hulls, sunflower hulls, wheat bran, and soybean hulls can improve broilers' nutrient utilization and live performance, as well as insoluble fiber's good effects on the gizzard and gastrointestinal , which increase nutrient utilization (Hetland *et al.*, 2004). There have been some findings on the impact of soluble and insoluble non-starch polysaccharides on the physiology and morphology of the digestive system of broilers (Banfield *et al.*, 2002; and Iji *et al.*, 2001).

Dietary fibers have gained increasing interest in feed formulation and are considered a functional feed supplement. Previous studies have shown the vital role of dietary fiber on gut development, digestive enzyme activities, and gizzard function, producing a positive effect on animal health, nutrient digestibility, and production performances (Hetland *et al.*, 2004).

Therefore, in order to draw conclusions about the effect of fiber, there are a lot of factors that need to be carefully considered. Factors such as fiber source (soluble vs. insoluble), particle size, level of inclusion, species, age, physiological status, dietary metabolizable energy and crude protein (CP) as amino acids levels, and duration of inclusion are among the most influential factors determining the effects of fibers on broiler diets (Sklan *et al.*, 2003; Tejeda and Kim, W.K., 2021; and Amerah *et al.*, 2009).

Wheat bran (WB), a byproduct of the milling process, is rich in insoluble fiber, consisting mainly of arabinoxylans and, to a lesser extent, cellulose and ß-glucans (Kamal-Eldin *et al.*, 2009). Researchers have mostly focused on how to eliminate the anti-nutritional effects of a high level of WB (Feng *et al.*, 2019).

In there, Ginindza *et al.*( 2022)study the effects of dietary crude fiber (CF) levels on the production performance of male Ross 308 broiler and indigenous Venda chickens, aged 1–21, and 196 chickens, aged 22–42 days. Chickens were allocated four diets with different levels of CF (3, 4, 5, and 7%) from wheat bran and maize bran as sources of fiber, and it was recorded that in phase 1, nitrogen retention of the Ross 308 broiler chickens was improved at dietary CF levels of 3.2%. In the Venda chickens, nitrogen retention was optimized at 4.1% CF. In Phase 2, feed intake, nitrogen retention, and neutral detergent fiber digestibility (NDFD) were enhanced at CF levels of 6.4, 4.4, and 3.7% in the Ross 308 broiler chickens, respectively. Dietary CF levels of 4.5, 5.8, 5.7, 5.1, 3.9, and 4.4% optimized the feed intake, growth rate, LBW, nitrogen retention, NDFD, and Acid detergent fiber digestibility, respectively, in Venda chickens. Salami R.I. and Odunsi A.A. (2019 )indicated that broilers were fed on diets with wheat bran as sources of C.F. 8% with their levels of metabolizable energy of 2600, 2800, and 3000 Kcal/Kg with or without enzymes 200 g/ton found significant improvement in productive performance as live body weight (LBW), body weight gain (BWG), feed consumption (FC), and feed conversion ratio (FCR) as well as an increase in fiber intake in birds fed on diets with 2800 Kcal/kg than in other treatments. Also, Chu *et al.* (2017) recorded an improvement in BWG in the 10% fermented WB group, which had lower FC than the others but an improved feed FCR compared to the control group.

Thus, this study aimed to evaluate the effects of high levels of fiber from wheat bran on productive performance, nutrient digestibility and economic efficacy.

## MATERIALS AND METHODS

The present experiment was implemented in Poultry Nutrition Farm, Poultry Production Department, Faculty of Agriculture, Ain Shams University, Qalyubia, Egypt, in order to investigate the effect of high CF levels from wheat bran on growth performance, nutrients utilization and economic efficiency.

***Experimental design:***

The study comprised of 120 Indian River (IR) unsexed one-day old chicks, that were randomly distributed into 4 treatments each treatment contained 3 replicates each replicate included 10 chicks. The experimental design and composition of the experimental diets (starter 1-21 days and grower 22-35 days of age) are presented in Tables (1 and 2).

***Experimental birds management:***

***Housing, ventilation and lighting:***

Chicks were housed in cages where birds have no access to litter. House and cage batteries were cleaned and disinfected. The lighting program was controlled to provide 23-hour light and one-hour dark daily by fluorescent tube lighting. The temperature was controlled and gradually reduced from 32 to 20°C on day 35.

***Feeding and watering:***

Feed was offered *ad-libitum* in mash form according to experimental diets in stainless steel feeders. Fresh water was accessible all the time by automatic nipple drinkers.

***Measurements and procedures:***

***Productive performance:***

All productive traits were determined on a replicate basis which is later used to establish means of different treatments. Weights were recorded by using a digital electronic balance. Live body weight and FC of broiler chicks were recorded, while, BWG and FCR were calculated, performance index (PI) was measured according to North (1981), Where, European productive efficiency factor (EPEF) according to Emmert (2000). Also, the protein conversion ratio (PCR) and calories conversion ratio (CCR) were calculated for overall period. Accumulative mortality number (MR) was calculated for each treatment during whole experimental period.

***Apparent nutrients utilization:***

During the last 5 d of the experimental period (30–35 day), excreta samples were collected using the partial collection method. Excreta was collected twice daily, in the morning and afternoon with the aid of plastic spatulas. Collected excreta were stored in duly identified plastic bags and immediately stored in a freezer (-18°C) until the analysis of appearance digestibility of dray matter (DM), CP (Nitrogen * 6.25), either extract (EE) and CF.

***Economic efficiency***

The economic efficiency traits were calculated according to North and Bell, (1981) in relation to the price of local market for feeding diets and selling of live broiler chickens at the exact time of the experiment.

***Statistical analysis:***

Data were statistically analyzed using the General Linear Model Procedure of analysis (**SAS, 2004**). Duncan’s multiple range test (**Duncan, 1955**), was used to test differences within means of treatments, while level of significance was set typically at minimum ($P\leq0.05$).

The statistical model used for analyzing data was as following:

$$Y_{ij} = M + T_i + e_{ij}$$

Where:

- $Y_{ij}$ = observation of the parameter measured.
- M = overall mean.
- $T_i$ = effect of treatment.
- $e_{ij}$= random error.

## RESULTS AND DISCUSSION

***Effect of different dietary treatments on productive performance:***

Data presented in Table (3) showed the effects of using different levels of WBas a source of fiber compared to a basal diet (control group) on LBW, BWG, FC, FCR, PI, European productive efficiency factor (EPEF), and MR.

***Live Body weight (g) and body weight gain (g):***

Results showed that the initial body weight of chicks at one day of age was nearly similar among all the experimental treatments, and the corresponding values ranged between 40.00 and 40.83 g without significant differences between treatments. Numerically, at the age of 35 days and during period 0-35 days values of BWG chicks fed WB 5% gave the higher LBW and BWG compared to other levels (WB 7.5% or 10%) and control.

***Feed consumption (g):***

Table (3) showed no significant differences in average FC per chick (g) during the experimental period (0-35 days); Numerically, FC per chick (g) decreased by feeding WB diets (T2 – T3) compared with those fed control and T1. The corresponding values for feed consumption during all experimental periods (0-35 days) ranged between 2755.00 and 2840.00, without significant differences.

***Feed conversation ratio (FCR):***

Results showed no significant differences between treatments in FCR during 0-35 days of age. Data shown in Table (3) regarding chicks fed on control diets recorded the best FCR (1.50). Numerically, the worst FCR was found in chicks fed T3 diets (1.53), which could be due to the lowest BWG (the differences between treatments were not significant).

***Mortality rate:***

Under the conditions of the present study, all chicks appeared healthy, and the total MR was 0.00% during the total experimental period (0-35 days).

***Performance index (PI) and European productive efficiency factor (EPEF):***

The PI and EPEF of broiler chicks as affected by experiments are illustrated in Table (3). The obtained data showed that there was a non-significant difference in Pl and EPEF among treatments during the studied period (0-35 days). Chicks fed diet containing 5%WB reflected the highest figures of PI and EPEF compared to other treatments. The corresponding values for Pl ranged between 124.67 and 118.19, while EPEF ranged between 356.19 and 337. 68.

***Effect of dietary treatments on CCR and PCR:***

Data for the CCR and PCR evolution of experimental diets are summarized in Table (4). Experimental treatments with WB ($T_{1-3}$) had no significant effect on CCR or PCR compared with the control group, during the whole experimental period (0-35) days of age, numerically, some differences were found between treatments (T1-3) and the control group, and these differences were due to improvements in CCR and PCR related to different levels of WB. The corresponding values for CCR ranged between 4.55 and 4.63 while PCR values ranged between 0.32 and 0.35; however, the differences failed to be significant.

***Effect of dietary treatments on nutrients utilization (%) of broiler chicks:***

Data presented in Table (5) showed the effects of using different levels WB compared to a control diet on DM, EE), CP, or CF. Data showed that there weren’t significant effect in DM, EE, and CP between treatments and control groups. The corresponding value ranged between 83.34 and 85.22% for DM, 93.36 and 95.39%for EE, and 83.91 and 85.56% for CP, while in CF utilization, the treatments (T1-3) were non-significantly affected by levels of WB 72.78, and 76.27%.

***Effect of dietary treatments on economic efficiency:***

The data for economic efficiency of feeding costs of broiler chicks as affected by diet during 0-35 days of age are shown in Table (6). Calculations of economic efficiency were carried out according to the prices of the feed ingredients, and LBW prevailing during February 2022 (the time of the experiment).

Economic efficiency values of broiler chicks fed diets WB compared to those birds fed control diets from 0-35 days of age were 55.02, 54.48, and 52.84%, respectively, while EE values for control group were 44%. Relative economic efficiency (REE) values were improved by 25.02, 20.08% and 29.05, respectively, for the group WB ($T_{1-3}$) compared to control group. Therefore, the best REE showed in WB at 10% (29.05).

***Productive performance:***

Using wheat bran as a source of high levels of fiber in IR broiler diets led to improve in LBW, BWG, FC and FCR in the lowest level (5% WB), while in another levels not affect in LBW and BWG this results agreed with (Zhang *et al.*, 2023; Scapini *et al.*, 2017; Liebl *et al.*, 2022; Salami and Odunsi, 2019; Shang *et al.*, 2020; and Ginindza *et al.*, 2022) they reported that using wheat bran in broiler diets improved in LBW, BWG, FC and FCR. Ginindza *et al.*, (2022) reported that the different levels of CF (3, 4, 5, and 7%) from WB Ross 308 broiler chickens improved LBW, BWG, FC, and FCR at dietary CF. This can be due to using WB in broiler diets, which led to an evaluation of intestinal morphology and organ development, which improved nutrient utilization, which reflected in the effect on performance

(McDonald *et al.*, 2010; Sacranie *et al.*, 2012; and Yokhana *et al.*, 2016). This evaluation led to an increase in the size of the digestive organ, which led to an increase in feed consumption and utilization.

***Nutrients utilization:***

Using WB as a source of fiber in broiler diets had no significant effect on nutrients utilization compared to control groups. These results agree with Faryadia *et al.* (2023, Wang *et al.* (2021) and Kurul *et al.* (2020) they reported that high fiber in bird diets had no effect on nutrient digestibility. Kurul *et al.* (2020) recorded that increasing the levels of fiber in 2, 4, and 6% broiler diets had no effect on nutrient digestibility. Also, disagree with Zhang *et al.*( 2023; Adibmoradi *et al.* (2016); and Wang *et al.* (2023) they reported that high fiber in bird's diets improved nutrient utilization.

***Economic efficiency:***

The results indicated that the high level of fiber from WB in broiler diets had a positive effect on economic efficiency, resulting in a decrease in feed prices and improvement in productive performance in all treatments ($T_{1\text{-}3}$), especially the improvement in FCR.

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**Table (1): Composition analysis of the experimental one diets.**

| **Ingredients (%)** | **Starter 0: 21 days** | | | |
|---|---|---|---|---|
| | **Control** | **Wheat bran 5%** | **Wheat bran 7.5%** | **Wheat bran 10%** |
| Yellow corn | 53.85 | 49.34 | 47.21 | 45.14 |
| Soybean meal (46% CP) | 33.00 | 33.00 | 33.00 | 33.00 |
| Corn gluten meal (60% CP) | 6.80 | 6.08 | 5.75 | 5.35 |
| Wheat bran | 0.00 | 5.00 | 7.50 | 10.00 |
| Soybean oil | 2.10 | 2.40 | 2.40 | 2.40 |
| Mono calcium phosphate | 1.75 | 1.64 | 1.59 | 1.53 |
| Limestone | 1.32 | 1.36 | 1.38 | 1.41 |
| HCL- Lysine | 0.28 | 0.27 | 0.26 | 0.25 |
| D-L Methionine | 0.30 | 0.31 | 0.31 | 0.32 |
| Salt | 0.30 | 0.30 | 0.30 | 0.30 |
| Premix* | 0.30 | 0.30 | 0.30 | 0.30 |
| Total | 100.00 | 100.00 | 100.00 | 100.00 |
| **Calculated composition**** | | | | |
| Metabolizable energy (Kcal/kg) | 3006 | 2920 | 2868 | 2816 |
| Crude protein (CP) % | 24.41 | 24.36 | 24.39 | 24.32 |
| Crude fiber (%) | 3.58 | 4.02 | 4.25 | 4.47 |
| Calcium (%) | 0.92 | 0.92 | 0.92 | 0.92 |
| Available phosphors (%) | 0.51 | 0.49 | 0.48 | 0.47 |
| Lysine (%) | 1.32 | 1.32 | 1.32 | 1.32 |
| Methionine (%) | 0.70 | 0.70 | 0.70 | 0.70 |
| Methionine + cysteine (%) | 1.08 | 1.08 | 1.08 | 1.09 |

**Each 3 Kg of premix containing: 15000000 I.U. Vit, A, 3000000 I.U Vit D 50g. Vit E, 3000mg Vit . K3. 3000 mg Vit . B1, 8000 mg. Vit B2, 4000 mg. VIT B6, 20mg. vit. B12, 15000 mg pantothenic acid, 60000 mg. niacin, 1500 mg. folic acid, 200mg. biotin, 200000 mg Vit C, 700 gm. choline chloride, 80 gm. Mn, 80 gm. zinc, 60 gm. iron, 10 gm. CU, 1 gm. Iodine, and 0.2 gm millennium, where CaCo3 was taken as a carrier up to 3kg, the inclusion rate was 3Kg premix/ton feed.*

*** Calculated analysis of the experimental diets was done according to (Brazilian feed stuffs, 2017).*

**Table (2): Composition analysis of the experimental diets.**

| Ingredients | Grower (22 – 35days) | | | |
|---|---|---|---|---|
| | Control | Wheat bran 5% | Wheat bran 7.5 % | Wheat bran 10% |
| Yellow Corn | 55.06 | 51.20 | 49.18 | 47.20 |
| Soybean meal 46% CP | 32.10 | 31.00 | 31.00 | 31.00 |
| Wheat bran | 0 | 5.00 | 7.50 | 10.00 |
| Corn Gluten meal 60% CP | 5.00 | 4.97 | 4.50 | 4.04 |
| Vegetable Oil | 3.70 | 3.70 | 3.70 | 3.70 |
| Calcium Carbonate | 0.88 | 0.93 | 0.96 | 0.96 |
| Mono Calcium Phosphate | 2.18 | 2.05 | 1.98 | 1.90 |
| HCL-Lysine | 0.21 | 0.25 | 0.26 | 0.26 |
| D-l Methionine | 0.27 | 0.30 | 0.32 | 0.34 |
| Salt (NaCl) | 0.30 | 0.30 | 0.30 | 0.30 |
| Premix* | 0.30 | 0.30 | 0.30 | 0.30 |
| Total | 100 | 100 | 100 | 100 |
| **Calculated composition ****| | | | |
| Metabolizable energy (kcal/kg) | 3099 | 3011 | 2960 | 2910 |
| Crude protein %, CP | 22.90 | 22.89 | 22.84 | 22.79 |
| Crude fiber (%) | 3.52 | 3.91 | 4.14 | 4.36 |
| Calcium (%) | 0.81 | 0.81 | 0.81 | 0.80 |
| Available phosphorus (%) | 0.60 | 0.57 | 0.56 | 0.55 |
| Lysine (%) | 1.22 | 1.25 | 1.26 | 1.26 |
| Methionine (%) | 0.64 | 0.66 | 0.68 | 0.69 |
| Methionine + Cysteine (%) | 1.00 | 1.03 | 1.04 | 1.06 |

**Each 3Kg of premix containing: 15000000 I.U. Vit, A, 3000000 I.U VIT. D 50g. VIT E, 3000mg VIT. K3. 3000 mg VIT. B1, 8000 mg. VIT B2, 4000 mg. VIT B6, 20mg. vit. B12, 15000 mg pantothenic acid, 60000 mg. niacin, 1500 mg. folic acid, 200mg. biotin, 200000 mg VIT C, 700 gm. choline chloride, 80 gm. Mn, 80 gm. zinc, 60 gm. iron, 10 gm. CU, 1 gm. Iodine, and 0.2 gm millennium, where CaCo3 was taken as a carrier up to 3kg, the inclusion rate was 3Kg premix/ton feed. *** Calculated analysis of the experimental diets was done according to (Brazilian feed stuffs, 2017).*

**Table (3): Effect of dietary treatments on productive performance of broilers chicks.**

| Items | Treatments | | | | SEM. | Sign |
|---|---|---|---|---|---|---|
| | Control (basal diet) | 5% wheat bran | 7.5% wheat bran | 10% wheat bran | | |
| **Live Body weight (g)** | | | | | | |
| 0 days | 40.33 | 40.66 | 40.66 | 40.70 | 0.07 | N. S |
| 35 days | 1870.33 | 1885.66 | 1837.79 | 1803.50 | 12.70 | N. S |
| **Body weight gain (g)** | | | | | | |
| 0 -35 days | 1830.00 | 1845.00 | 1797.13 | 1762.80 | 12.73 | N. S |
| **Feed consumption (g)** | | | | | | |
| 0 -35 days | 2755.00 | 2790.67 | 2708.63 | 2690.37 | 16.70 | N. S |
| **Feed conversion ratio (g feed/g gain)** | | | | | | |
| 0 -35 days | 1.50 | 1.51 | 1.51 | 1.53 | 0.01 | N. S |
| **PI** | 124.23 | 124.67 | 121.97 | 118.19 | 1.13 | N. S |
| **EPEF** | 354.96 | 356.19 | 348.48 | 337.68 | 3.24 | N. S |
| **Mortality rate** | 0/30 | 0/30 | 0/30 | 0/30 | ......... | ......... |

*a,b,c and d means in the same raw with different superscripts in the same raw are significantly ($P>0.05$) different, N.S.: non-significant.*

**Table (4): Effect of dietary treatments on calories and protein conversion ratio.**

| Items | Treatments* | | | | SEM | Sign. |
|---|---|---|---|---|---|---|
| | Control (basal diet) | 5% wheat bran | 7.5% wheat bran | 10% wheat bran | | |
| **Calorie conversion ratio (CCR).** | | | | | | |
| 0 -35 days | 4.59 | 4.55 | 4.63 | 4.56 | 0.04 | N. S |
| **Protein conversion ratio (PCR).** | | | | | | |
| 0 -35 days | 0.33 | 0.32 | 0.33 | 0.35 | 0.01 | N. S |

*N.S.: non-significant*

**Table (5): Effect of dietary treatments on some of nutrients utilization (%).**

| Items | Treatments | | | | SEM | Sign. |
|---|---|---|---|---|---|---|
| | Control (basal diet) | 5% wheat bran | 7.5% wheat bran | 10% wheat bran | | |
| Dry matter | 85.22 | 85.34 | 83.82 | 83.34 | 0.35 | N. S |
| Ether extract | 93.36 | 95.39 | 94.39 | 94.15 | 0.31 | N. S |
| Crude protein | 83.91 | 84.42 | 85.56 | 85.51 | 0.23 | N. S |
| Crude fiber | 72.78 | 76.27 | 75.61 | 73.54 | 0.42 | N. S |

*N.S.: non-significant.*

**Table (6): Effect of dietary treatments on economic efficiency % of broilers chicks.**

| Items | Treatments | | | |
|---|---|---|---|---|
| | Control (basal diet) | 5% wheat bran | 7.5% wheat bran | 10% wheat bran |
| AFC (g)* | 2755 | 2790.67 | 2690.37 | 2840 |
| Feed cost/chicken (LE) | 23.36 | 21.06 | 20.04 | 21.628 |
| Total cost/chicken (LE) | 36.36 | 34.06 | 33.04 | 34.63 |
| LBW (g)** | 1870.33 | 1885.66 | 1803.5 | 1941.53 |
| Total return (LE) | 52.36 | 52.80 | 50.50 | 54.36 |
| Net return (LE) | 16.00 | 18.73848 | 17.458 | 19.73 |
| Economic efficiency %(EE)*** | 44.00 | 55.02 | 52.84 | 56.99 |
| Relative**** (EE)% | 100 | 125.02 | 120.08 | 129.51 |

**AFC: Average feed consumption, **LBW: Live body weight. price at the experimental time LE / kg of LBW of chicken= 28 LE ***EE = Net return/ total chicken cost x 100,*
***** Relative EE = assuming EE of the control equals 100 %.*

# تاثير مستويات الالياف فى علائق دجاج اللحم على الاداء الانتاجى والاستفادة من العناصر الغذائية والعائد الاقتصادى: 1- نخالة القمح

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اجريت تجربة للتعرف على تاثير المستويات المختلفة من نخالة القمح كمصدر للالياف فى علائق دجاج اللحم على الاداء الانتاجى والاستفادة من العناصر الغذائية والعائد الاقتصادى. استخدم فى التجربة 120 كتكوت تسيمن سلالة IR. وزعت الكتاكيت عشوائيا (10 كتكوت/قفص) على 4 معاملات غذائية (كنترول و $T_{1-3}$ ) وكل معاملة احتوت على 30 كتكوت (3 تكرارات/10 كتكوت) وكانت المعاملات كالاتى:

- كنترول (0% نخالة قمح)
- T1 (5% نخالة قمح)
- T2 (7.5% نخالة قمح)
- T3 (10% نخالة قمح)

طول الفترة التجربية (35 يوم) مع توفير الماء والعلف بصورة حرة حيث غذيت الكتاكيت على عليقة بادى تسمين 23% بروتين خام (1-21 يوم) وعليقة نامي 21% بروتين خام (22-35 يوم)

اوضحت النتائج ان:استخدام نخالة القمح كمصدر للالياف فى علائق بدارى التسمين حتى مستوى 10%

- لا يوثر على الاداء الانتاجى (وزن الجسم – الوزن المكتسب – استهلاك العلف – معامل التحويل الغذائى – معامل الاستفادة من الطاقة والروتين)
- لا يوثر على الاستفادة من العناصر الغذائية (المادة الجافة – الدهن الخام – البروتين الخام – الالياف الخام)
- له تاثير ايجابى على تكاليف الانتاج والعائد الاقتصادى النسبى الذى يتحسن بمعدل 25% T1و 24%T2 و20% T3 بالمقارنة بمعاملة الكنترول

الخلاصة:

تغذية كتاكيت دجاج اللحم على علائق تحتوى على نخالة القمح حتى مستوى 10% لا يؤؤثر على الاداء الانتاجى والاستفادة من العناصر الغذائية ويحسن العائد الاقتصادى