

# **An Experimental Study On The Effect Of Feed Varieties On Weight Of Broilers Species**

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## **Abstract**

*This study was aimed to examine the effect of feed types on species of broiler with attention on the weight gain over a period of 6 weeks. Five varieties of feeds were administered on 2 units each of Marshall and Ross 308 and weights gained for the duration of the investigation were recorded. The factorial design involved feed varieties and specie as the two factors. Granulated maize was used as control and supplement for TF and NH to formulate the hybrid versions of the feeds. The Estimated Marginal Mean (EMM) was estimated to examine the average response of each factor. The analysis of variance revealed there is significant difference in the weight gain due to the effect of the feed formulations with Pvalue of 0.000. The Post Hoc analysis with Duncan Multiple Range test (DMRT) for multiple comparison to determine homogeneous subsets revealed that the granulated maize (0.2412) has the least effect while NH (mean=1.0346) and TF (mean=0.9150) outperformed their hybrid version MNH (1.0019) and MTF (0.5237) indicating the tendency of reduction in the effect of the feed as a result of the granulated maize mixed as supplement. The hybrid MNH and granulated maize were considered as homogeneous subsets based on the test of multiple comparisons.*

**Keywords:** *Specie, factorial design, Estimated Marginal mean, Duncan, hybrid*

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## **I. Introduction**

Feed is a crucial factor that directly impacts the growth performance of broiler chickens (Adedokun & Olojede,2019; Zampiga, Calini, & Sirri,2021). Ansari, Guldhe, Gupta, Rawat, and Bux,(2021) opined that feed serves as the primary source of energy and nutrients necessary for optimal growth, and various feeding strategies can lead to different performance outcomes. Jha, Das, Oak, and Mishra, (2020) highlighted factors such as feed composition, feeding frequency, and the inclusion of additives like probiotics or synbiotics as poultry practices that can determine growth rates and overall health in broiler chickens. Ndlebe,Tyler, and Ciacciariello (2023) also highlighted feed composition, nutrient density, and physical form of the feed as some of the factors that can significantly determine feed intake, body weight gain, and feed conversion ratio in broilers. Maharjan et al. (2021) asserted that the growth rate of broilers is significantly influenced by the type and management of feeds. Lack of homogeneity in feeding can also adversely affect broiler performance, especially during the early growth phase when they consume only a few grams of feed that must contain all essential nutrients (Rocha, Dilkin, Neto, Schaefer & Mallmann,2022).Trocino et al. (2020) posited that feed restriction during specific growth phases can lead to compensatory growth in broilers, resulting in improved feed conversion ratio and final body weight compared to ad libitum feeding. Feed conversion ratio and production index in broilers without adversely affecting nutrient digestibility or carcass characteristics (Hernandez, 2024; Yue, Cao, Shaukat, Zhang, & Huang, 2024).

Studies have also revealed other factors that may influence the growth rate of broilers and chicken generally. Wen (2021) posited that feeding frequency regimens plays a crucial role in the weight gain by chicken. The nutritional quality of the feed, including its homogeneity and the balance of macronutrients directly affects feed intake and conversion ratio which are critical for achieving desired growth rates (Chand, Indu, Singhal, & Govindasamy, 2022). Ogbuewu and Mbajiorgu (2023) opined that growth performance can also be enhanced with the aid of dietary supplements which are catalyst for absorption rate and gut health. Good knowledge of these dynamics is essential for poultry producers aiming to optimize broiler production efficiency while minimizing costs (Saheed,2023; George & George,2023)..

Studies involving evaluation of more than one factor at different levels of each factor require a careful design and application of proficient tools which can measure the effects of the factors and the interactions conveniently and accurately. Jankovic Chaudhary and Goia (2021) posited that the factorial design plays a very crucial role in cases where the experimental inquiry involves more than one factor applied at two or more levels. Factorial design is a research methodology that examines the effects of two or more independent variables on one or more dependent variables (Maulud & Abdulzееz, 2020; Bhattacharya, 2021). Gilman, Walls, Bandiera and Menolascina (2021) opined that factorial design is capable of simplifying complex relationships by providing analysis of both main and interaction effects in experiments. The factorial design is adopted due to its proficiency in handling multiple factors simultaneously. The design layout is presented under materials and methods in section 2.0. The rest of this paper is arranged as follows; section 3.0 presents the results of analysis, 4.0 deals with discussion of results and 5.0 deals with conclusions and recommendations

## II. Materials And Methods

The experimental units consist of three species of broiler (Marshall, Ross 308 and Cobb 500) raised under the same conditions with five formulations of feeds (granulated Maize, NH, TF, hybrid-MNH, hybrid-MTF) over a period of 6 weeks. The hybrid is a mixture of the NH and TF with granulated maize while granulated maize was considered as a control. The weight gain by the experimental units are measured and recorded on weekly basis. A full factorial design with two replicates for each combination was employed for the analysis to examine the main effects of the factors feeds and species as well as the interaction between the factors.

## III. Results And Discussions

The result in table I shows the estimated marginal means (EM) for the species and the feed varieties. For species, EM for Marshall and Ross 308 are 0.592 and 0.595 respectively with a standard error of .114 within the confidence interval (0.366, .817) and (.370, .820) respectively while EM for Cobb 500 is 0.980 with a standard error of .104 and confidence interval (.775, 1.186) which indicates a slight departure from the estimates for Marshall and Ross 308.

**Table I: Estimated marginal means, standard error, confidence interval for species and feed type**

Specie	Marshall Ross 308 Cobb 500	mean	Std.Error	95% Confidence interval	
				Lower	upper
		.592 <sup>a</sup>	.114	.366	.817
		.595 <sup>a</sup>	.114	.370	.820
		.980 <sup>a</sup>	.104	.775	1.186
Feed	Maize	.241 <sup>a</sup>	.131	-.019	.5010
	NH	1.035 <sup>a</sup>	.131	.775	1.295
	TF	.915 <sup>a</sup>	.131	.655	1.175
	hybrid MNH	.601	.161	.283	.9190
	hybrid TF	.524 <sup>a</sup>	.131	.264	.7840

The EM for maize (control) is .241 while the EM for NH, TF, hybrid MNH and hybrid TF are 1.035, 0.915, 0.601 and 0.524 respectively with uniform standard error 0.131 except for hybrid MNH with 0.161. The confidence intervals show maize with the least estimates for lower and upper bounds of -0.019 and 0.5010 respectively, the hybrid MNH and hybrid TF have intermediate estimates while TF has the highest estimates of 0.775 and 1.295 respectively.

The analysis of variance in table II shows a value of 0.000 for both species and feed which indicates that there exist significant differences in the weight gain for the species and feed formulations. However, the interaction effect between species and feed is insignificant.

**Table II: showing the analysis of variance for the experiment**

Source of variation	Sum of square	Degree of freedom	Mean square	sig	Sum of square
Specie	8.393	2	4.196	10.162	0.000
Feed	18.951	4	4.738	11.473	0.000
Specie*Feed	0.001	3	0.000	0.001	1.000
Error	45.427	110	.413		
Total	65.597				

Table III presents the means for the varieties of feeds and homogeneous subsets based on Duncan Multiple Range test (DMRT). The test of multiple comparison revealed that granulated maize and hybrid MTF as homogeneous subsets with mean .2412 and .5237 respectively.

**Table III: result of Duncan Multiple Range Test (DMRT) for comparison**

Feed	N	Subset	
		1	2
Maize	24	.2412	
Hybrid MTF	24	.5237	
TF	24		.9150
Hybrid MNH	24		1.0019
NH	24		1.0346

The DMRT also revealed that means of TF, hybrid MNH and NH are 0.9150,1.0019 and 1.0346 respectively are homogeneous subset. This implies that hybrid MTF is not significantly different from granulated maize (control) which has the least effect on the weight gain by broilers. In contrast, the three other three formulations TF, hybrid and NH which are homogeneous subsets but significantly different from the homogeneous subset of granulated maize and hybrid MTF.

#### IV. Conclusions

The findings of the study revealed a significant difference in the effects of the feeds on the weight gain over the period of the experiment by species of broiler. It can be concluded that granulated maize has the least effect on the weight of broilers. Though granulated maize can serve as a supplement but the result revealed that effect of TF and NH are higher than hybrid MTF and hybrid MNH respectively which indicate the tendency of granulated maize to impair the performance of the individual feeds. NH outperformed TF and hybrid MNH as shown in the performance of hybrid MNH over TF. The weight gain by the species also indicates a significant difference.

#### V. Recommendation

The outcome this study suggest the need to examine the efficiency of feed varieties further with the aim of achieving optimal output in terms of weight gain in broilers. It also suggests the need to ascertain the effect of supplements in feed formulation to avoid such supplement capable of reducing the effects of the feeds. Generally, further studies can as well be carried out on effect of different formulations on the growth of poultry birds.

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