



## Effect of Sorghum Based Feed on Carcass Weight Gained for Broiler Production in Bauchi State, Nigeria

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### ABSTRACT

The study investigated the Effect of Sorghum Based Feed on Carcass Weight Gained for Broiler Production in Bauchi State, Nigeria. The study was guided by three objectives, three research questions and three null hypotheses. Experimental research design was used for the study. One Broilers were used for the study. The broilers were grouped in to four constituting twenty five broiler randomly assigned to 1 control and 3 experimental groups. The major source of energy feed used for the chickens are Maize grain, White Sorghum (farfara), Red Sorghum (jar dawa) and Yellow Sorghum (kaura). The birds were raised in a clean floor system pen which was partitioned into 4 pens, each with stocking density of 25 chickens per m<sup>2</sup> from day old to seven weeks of age. Body weight changes were taken using sensitive balance every week starting from day old. The chickens were vaccinated with live vaccine against marek's disease at the first day and against Newcastle Disease (HB1) on third and 21st day through ocular and against Gumburo at 21 day through drinking water. Weighing each chicken, feed and maintenance cost and weighting of the chicken were recorded every weekly. Four broilers were randomly selected from each replication (16 birds) and starved for 12 hours, weighed and slaughtered for carcass evaluation. The weight of edible parts was recorded for carcass. Mean score and mean difference was used to answer the research questions while ANOVA was employed to test the null hypotheses at the 0.05 level of significance. The study revealed among others that there were no significant differences among the average total cost incurred of breeding Broilers fed with maize, red sorghum, yellow sorghum and white sorghum. The researcher concluded that the profitability ratio of poultry chickens will increase if sorghum is used as replacement to maize grain. It was recommended among others that Sorghum feeds should be used as a replacement of maize for Broiler agri-business in Bauchi state.

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### INTRODUCTION

The scarcity of high quality animal food in developing countries has made the consumption animal protein food out of reach of many people. To address the situation, poultry production has been identified as one major means for the overcoming the phenomenal. Poultry in the industrial system are birds housed in confinement with the aim of creating optimal

conditions of temperature and lighting and in order to manipulate day length to maximize production. According to Sunil (2015), poultry farming is the raising of domesticated birds such as chickens, turkey, ducks and geese, for the purpose of providing meat or eggs for food

Broiler production industry is an important source of animal protein in Bauchi



state. Evidence by Ministry of Agriculture, Water and Forestry, (2008) revealed an increased demand of poultry meat of 70,000 kg per month in the northern regions of Bauchi for broiler meat by consumers. The situation is not different in the remaining regions in the state. The major advantage of Broiler meat is its lower iron contents (Farrell, 2010), lean meat, as well as more desirable unsaturated fatty acids (Appleby, 2010). Therefore, it is perceived as healthy and nutritious as compared to beef and lamb. With the increase in demand of meat and strive for self-reliance, many people venture into farming of broilers. According to Borggaard and Andersen (2004), Broiler farming provides nutritious meat for human consumption, source of income for business men, serves as a good measure to reduce poverty within the society and good source of revenue to the government within the shortest possible time.

The success of broiler farming as business venture is dependent upon supplying the birds with feed of the highest achievable quality, in terms of ingredients used, processing procedures applied as well as the form in which the diet is presented to broilers. Arbor (2009) observed that maize is the chief energy source in compounded diets and constitutes about 50% of poultry ration. Atteh (2012) reported that maize being the major energy source in Broilers production, provide live weight to the birds (weight gain) which enable them to use the sensitive balance on daily basis during both starter and finisher phases, and also it improves the carcass weight after bleeding and de-feathered.

Maize as the major energy source in Broilers production also provides food and fuel for human being and feed for animals, it has great nutritional value and can be used as raw material for manufacturing many industrial products (Afzal, Nasir, Bashir, & Khan 2009). Poultry production which expressed the road map of the entire study, some indices in relation to Poultry Feed Formulation, General Biology of Broiler Chicken, Origin and Distribution of Sorghum, Types of sorghum, Sorghum Production, Nutritional Value of Sorghum, Nutritional value of Sorghum in Livestock Feed, Feeding Value of Sorghum in Poultry Diets,

Digestibility and Energy Value of Sorghum. Grain and Sorghum By-Products were also discussed to determine the gap which study intends to fill based on this review the study determine that there is no work done in relation to effects of sorghums feed on Broilers weight gain, carcass weight for Agribusiness specifically in Bauchi state, most of the study carried out were based on experiment with birds in different areas in the country or the world at large.

In terms of the nutritive value, cost and availability, sorghum grain is the next alternative to maize in poultry feed (Subramanian and Metta, 2010). The energy value of sorghum is rated as high as 90 – 100% of maize depending on the livestock specie. Several varieties of sorghum have been developed and introduced in Nigeria, (Institute of Agricultural Research, 2015). Based on these citations, the research investigated the effects of sorghums feed on Broilers weight gain and carcass weight for agricultural education students in Bauchi state.

#### **Statement of the Problem**

Challenges on changes in price of the grains, competition in consumption between humans, animals, industries and availability of the key grains particularly maize affects feed availability for production (Furlan, 2013). Demand of maize, has increased worldwide with emphasis being placed on export and other diversified use mostly in flour based foods and ethanol production as an alternative source of fuel (Thornton, 2017). Etuk (2018) stated that serious diversification of energy feedstuff for other purpose is a serious challenge to poultry production in Nigeria. Based upon these the study attempts to determine the effects of effects of effect of sorghum based feed on carcass weight gained for broiler production in Bauchi State.

#### **Objectives of the Study**

The main objective of this study was to find out the effects of effect of sorghum based feed on carcass weight gained for broiler production in Bauchi State, Nigeria. Specifically the study intends to:

1. Ascertain the difference between the average weight gains of broilers fed



- with maize and sorghum for broiler production in Bauchi State
2. Determine the difference between the average carcass weight of broilers fed with maize and sorghum for broiler production in Bauchi State
3. Determine the difference between the average profits of broilers fed with maize and sorghum for broiler production in Bauchi State

### Research Questions

The following research questions were formulated to address the problem

1. What is the difference between the average weight gains of broilers fed with maize and sorghum for broiler production in Bauchi State?
2. What is the difference between the average carcass weight of broilers fed with maize and sorghum for broiler production in Bauchi State?
3. What is the difference between the average profits of broilers fed with maize and sorghum for broiler production in Bauchi State?

### METHODS AND MATERIALS

The design used for this study was experimental design where 100 day old broilers were assigned to one control and three different experimental groups following a completely randomized design (CRD). Completely randomized designs were for studying the effects of one primary factor without the need to take other nuisance variables into account. Each treatment group had four replicates of 25 healthy

day old birds per treatment. The broilers were randomly distributed by counting 5 to avoid bias in the distribution. This replicates the group to give near uniform initial weights for all the groups. The study area was Bauchi state. The number of birds used for the study was one hundred (100) broilers. The chickens were group in to four (4) constituting twenty five (25) in each group. Data were collected in three phases; in the first phase the researcher weigh each chicken to be used for the experiment using sensitive balance scale, in the second phase of data collection, the researcher recorded weekly feed and maintenance cost for the various groups of chickens, at the end of the experimental period the cost was sum up. The average weight of the carcass was recorded from four sample birds following completely randomized design, to determine the carcass weight. The experimental exercise ended at the 7<sup>th</sup> week while the carcass evaluation was conducted in the 8<sup>th</sup> week. The data collected were analyzed in two stages; in first stage, mean and mean difference was used to answer the four research questions and in the second stage, Analysis of Variance (ANOVA) was employed to test the null hypotheses at the 0.05 level of significance and ANOVA was used in testing the hypotheses. The materials used for this study were 100 day old broiler chicks, 5mm sieve straine, feeds, feeders, water, drinkers, sensitive balance scale, paper bags, vaccines, charcoal and clay pot.

### RESULTS

The results of the study were presented in the following Tables;

**Table 1:** Mean comparison the weight gains of Broilers fed with maize, red sorghum, yellow sorghum and white sorghum for broilers production

Feeding	Average Weight Gained	Comparison	Mean Difference (I-J)	Decision
Maize	1728	2.00	-70	VSD
		3.00	05	VSD
		4.00	20	VSD
White sorghum	1798	1.00	-70	VSD
		3.00	75	VSD
		4.00	90	VSD
Yellow sorghum	1723	1.00	-5	VSD



Feeding	Average Weight Gained	Comparison	Mean Difference (I-J)	Decision
Red sorghum	1708	2.00	-75	VSD
		4.00	15	VSD
		1.00	-20	VSD
		2.00	-90	VSD
		3.00	-15	VSD

Source: *Field survey, 2021*

Table 1 above shows the results of average weight gains of broilers fed with maize and sorghum for broiler production is as presented in Table 3. The result indicated that the average weight of Broilers fed with maize was 1728 gram. Chickens fed with red sorghum weight 1708 gram. Chickens fed with yellow sorghum had average weight of 1723 white those fed with white sorghum had average weight of

1798. The average weight gains of 1798 gram obtained from chickens fed with white sorghum was the highest with mean difference ranging between  $\pm 5$  to  $\pm 90$  grams. The result therefore indicated that there are very slight differences between the average weight gains of Broilers fed with maize, red sorghum, yellow sorghum and white sorghum.

**Table 2:** Mean comparison the carcass weight of Broilers fed with maize, red sorghum, yellow sorghum and white sorghum for poultry production

Feeding	Average Carcass weight	Comparison	Mean Difference (I-J)	Decision
Maize	1621	2.00	55.00	Slight difference
		3.00	-11.00	Slight difference
		4.00	61.00	Slight difference
Red sorghum	1566	1.00	-55.00	Slight difference
		3.00	-66.00	Slight difference
		4.00	6.00	Slight difference
White sorghum	1632	1.00	-8.00	Slight difference
		2.00	47.00	Slight difference
		4.00	72.00	Slight difference
Yellow sorghum	1560	1.00	-61.00	Slight difference

Source: *Field survey, 2021*

Table 2 above shos the mean analysis on difference between the average carcass weight of Broilers is presented in Table 4. From the Table, the weight of carcass qualities of bbroilers fed with fed with maize, red sorghum, yellow sorghum and white sorghum for students' agribusiness stood at 1621, 1566, 1560 and

1632. The difference range between  $\pm 72$  grams indicated that there was very slight difference among the broilers. The result therefore indicated there are very slight differences between the average carcass weight of Broilers fed with maize, red sorghum, yellow sorghum and white sorghum for poultry production.



**Table 1:** Mean comparison the profits of Broilers fed with maize, red sorghum, yellow sorghum and white sorghum for poultry production

S/No.	Feeding	Average		Profit	Comparison	Diff	Remark
		Disposable Price	Total cost				
1	Maize	1450	1116	334	2	-48	VSD
					3	-61	VSD
					4	-54	VSD
					1	48	VSD
2	Red sorghum	1450	1068	382	3	-13	VSD
					4	-6	VSD
					1	61	VSD
3	White sorghum	1450	1055	395	2	13	VSD
					4	7	VSD
					1	54	VSD
4	Yellow sorghum	1450	1062	388	2	6	VSD
					3	-7	VSD

**Source:** Field survey, 2021

The result presented in Table 5 revealed the average profit of N334 for broilers chicken fed with Maize. The average profit of Broilers fed with red sorghum was N382. The average profits of broilers chickens fed with white sorghum and that fed with yellow sorghum stood at N395 and N388 respectively. From the analysis, the Broilers fed with white sorghum had the highest profit ratio, however the profit range between  $\pm N0,061$  which falls under the benchmark of very slight difference.

### CONCLUSION

It was observed that sorghum can replace maize in broiler feed formulation without adverse effect on broiler and carcass weight gains. By implication, the sorghum feed as the major source of energy has no any side effect on the broilers. Also the use of sorghums based feed for broiler in poultry production will enhance the profitability ratio of the business.

### RECOMMENDATIONS

Based on the finding of the study, the following recommendations were made:

1. The average carcass weight of broilers fed with white sorghum was slightly higher; hence white sorghum should be used as an alternative to maize for broiler feed formulation in poultry production.

2. Broiler should be fed with white sorghum, because those fed with white sorghum have slight weight advantage over those fed with maize, red sorghum and yellow sorghum.
3. White sorghum should be used for feeding Broiler because it has slight profitability ratio advantage over those fed with maize, red sorghum and yellow sorghum grains broiler production.

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