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Qualities of Meat of Cockerel and Egg of Pullet Fed with Varying Levels of *Moringa oleifera* and *Ocimum Gratissimum* Leaf Meal

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***Abstract*— Moringaoleifera and ocimumgratissimum are plants of medicinal importance, the leaves of these plants were included at varying level to the feed of Cockerel and Egg type chicken to determine their effect on quality of meat . The birds were fed from day old for 35weeks with varying dietary level of inclusions of the leaf meals from 0% inclusion to 1%. 0% serve as control. Some birds were fed with inclusion of moringaoleifera meal (MOLM) only; some were fed with ocimumgratissimum meal (OGLM) only, while others were fed with a mix of MOLM and OGLM. 0% inclusion has none of the leaf meal and it serves as the control. The inclusion of the leaves in the feed showed good effect on the quality of the meat and other qualities were better than the control. There were more of the fleshy/meaty part of the birds, the thigh and the breast while the small and large intestine, spleen and bone percentage were reduced. The percentage Gizzard, liver and muscles increased. The proximate composition of the meat show better percentage compared with the control and the minerals such as calcium, phosphorus, Iron and Magnesium contents were higher compared to control. The chilling and cooking loss were reduced in the meat from the bird fed with the inclusions.**

***Index Terms*— moringaoleifera, ocimumgratissimum, egg of pullet, cockerel, leaf meal.**

I. INTRODUCTION

The origin of foods is from plant and animal, consumption of these by omnivorous animals reveal source of nutrients and vitamins. Plants with good nutritional components fed to animal can result in good source of meat for Human consumption.

Many plants also produce secondary metabolites such as phenolic compounds, essential oils and sarasaponins[6]. The medicinal values of these plants lie in their phytochemicals, which produce definite physiological actions on human and animal body. The most important of these phytochemicals are alkaloids, tannins, flavonoids and phenolic compounds [10]. Among the medicinal herb of importance is *Ocimum species* (basil) such as *O. gratissimum, O. sanctum, O. canum, O. basilicum etc.*Lanjewar *et al*. [8] reported that supplementation of tulsi (*Ocimum sanctum*) leaf powder at the rate of 1% in broiler diet for 42 days reduced meat and blood cholesterol levels of broiler.*Ocimumgratissimum* has been used extensively in traditional medicine in many countries [12] and has been reported to possess antimicrobial and insecticidal properties.

Another herb of importance is *Moringaoleifera* Lam., a member of the family Moringaceae, which is a fast-growing plant, widely available in the tropics and subtropics with great economic importance for the food and medical industries [4]. *Moringaoleifera*fondly called "The Miracle Tree" is currently drawing global attention as a multi-utility plant. The tree is widespread throughout the tropics and found around farms and compounds, and is often used as live-fence especially in the Northern parts of Nigeria. The products of this miracle plant (also called a life saver) have been reported to be of high value to nutritionists, animal scientists, pathologists, entomologists, environmentalists and practitioners of natural medicine [9]. Olugbemi *et al*.[11] reported that; inclusion of *Moringaoleifera* leaf meal (MOLM) at varying levels up to 10% in cassava chip based diets fed to commercial egg laying birds is possible and without negative effects in terms of egg quality parameters. The benefits of enhanced acceptability are equally an advantage of its inclusion. This work investigated the output of varying levels of inclusion of *moringaoleifera* and *ocimumgratissimum* in bird and the output of meat and egg is presented.

II. MATERIALS AND METHODS

A total of four hundred and five (405) "Isa" strains of day old pullet chicks obtained from a commercial hatchery (Avian specialities limited Lagos bye pass Ibadan, Oyo state) were brooded. Newcastle disease vaccine (NCDVi/o) and Marek's disease vaccine (MDi/o) were administered on the 1st day while Gumboro (medication) and fowl pox (wing web) vaccine were given in the 3rd and 6th week respectively. The control group was provided with anti stress drug (Vitalyte®) in the first 3 days as well as antibiotics(Keproceryl®) from 3rd to 7th day and subsequently at 8 weeks interval, anticoccidial(Vazuril®) and antihelminth (Coccimet®) drugs were also administered. These prophylactic measures were denied the birds on leaf meals. The birds were raised under an adequately ventilated deep litter system up to sixteen (16) weeks of age using wood shavings as the bedding material. The depth of the litter was 5 to 8cm at chicks phase and 15 to 20cm at growing/adult phase. Feed and water were supplied *ad libitum*.

Experimental Layout

The experimental birds were randomly allotted to nine

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treatment groups and three replicate per treatment. There were forty five birds in each dietary treatment with fifteen

Birds per replicate, each replicate were housed in a pen measuring 3.12 x 1.15m in an open sided poultry pen.

Experimental treatment

Moringaoleifera leaf meal (MOLM) and *Ocimumgratissimum*leaf meal (OGLM) were included in the diets of the experimental birds to replace wheat offal as shown in the diet listed below. The various levels of inclusions were:

Treatment one (T_1); 0% MOLM (control)
Treatment two (T_2); 0.5% MOLM
Treatment three (T_3); 1.0% MOLM
Treatment four (T_4); 0% OGLM (control)
Treatment five (T_5); 0.5% OGLM
Treatment six (T_6); 1.0% OGLM
Treatment seven (T_7); 0% MOLM &OGLM (control)
Treatment eight (T8); 0.5% MOLM &OGLM
Treatment nine (T_9); 1% MOLM & OGLM
Experimental diet (Starter phase)

The experimental diets (%) are as shown in Tables 1 and 2 for starter and grower phases respectively. Treatments 1, 4 and 7 (control groups) have the same physical and analysed composition, therefore, will be represented by 0% (T1: 0%) on the tables.

Table 1: Composition (%) of Experimental Diets (Starter phase)

		MOLM		OGLM		MOLM/OGLM	
Ingredients	00%	0.5%	1.0%	0.5%	1.0%	0.50%	1.0%
Maize	40.00	40.00	40.00	40.00	40.00	40.00	40.00
Fish meal	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Soybean meal	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Palm kernel meal	10.00	10.00	10.00	10.00	10.00	10.00	10.00
Wheat offal	23.00	22.50	22.00	22.50	22.00	22.50	22.00
Bone meal	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Oyster shell	2.00	2.00	2.00	2.00	2.00	2.00	2.00
MOLM	0.00	0.50	1.00	0.00	0.00	0.25	0.50
OGLM	0.00	0.00	0.00	0.50	1.00	0.25	0.50
Lysine	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Methionine	0.25	0.25	0.25	0.25	0.25	0.25	0.25
*Vit/mineral premix	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Salt (Nacl)	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Total	100	100	100	100	100	100	100
Determined analysis (%)							
Crude protein	19.09	19.78	19.96	19.24	19.31	19.37	19.68
Ether Extract	3.87	3.92	3.96	3.97	4.10	3.89	4.00
Crude fibre	4.45	4.45	4.43	4.45	4.45	4.45	4.42
Ash	3.66	3.64	3.67	3.66	3.65	3.68	3.67
Calcium	1.92	1.93	1.95	1.95	1.96	1.94	1.95
Phosphorus	0.97	0.98	0.98	0.97	0.97	0.97	0.97
Energy (Kcal/Kg)	2573.30	2573.67	2573.70	2573.40	2573.50	2573.44	2573.61

*Vit./Min. Premix contains B1,1g; B2, 6g; B12, 0.02g; K3, 3g; E, 30g; biotin, 0.05g; folic acid, 1.5g; choline chloride, 250g; nicotinic acid, 30g; Ca-Pantothenate, 15g; Co, 0.4g; Cu, 8g; Fe, 32g; I, 0.8g; Zn, 40g; Mn, 64g; Se, 0.16g, BHT, 5g.

MOLM = Moringaoleifera leaf meal

OGLM =Ocimumgratissimumleaf meal

MOLM/OGLM = Moringaoleifera/Ocimumgratissimumleaf meals

Table II: Composition (%) of Experimental Diets (Grower Phase)

		MOLM		OGLM		MOLM/OGLM	
Ingredients	0 0.0%	0.5%	1.0%	0.5%	1.0%	0.5%	1.0%

Maize	50.00	50.00	50.00	50.00	50.00	50.00	50.00
Soybean meal	14.00	14.00	14.00	14.00	14.00	14.00	14.00
Wheat offal	31.00	30.50	30.00	30.50	30.00	30.50	30.00
Bone meal	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Oyster shell	2.00	2.00	2.00	2.00	2.00	2.00	2.00
MOLM	0.00	0.50	1.00	0.00	0.00	0.25	0.5
OGLM	0.00	0.00	0.00	0.50	1.00	0.25	0.5
Lysine	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Methionine	0.25	0.25	0.25	0.25	0.25	0.25	0.25
*Vit/mineral premix	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Salt (Nacl)	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Total	100	100	100	100	100	100	100
Determined analysis (%)							
Crude protein	15.58	15.48	15.61	15.42	15.58	15.55	15.59
Ether Extract	3.07	3.11	3.11	3.20	3.24	3.09	3.11
Crude fibre	5.66	5.66	5.65	5.14	5.66	5.62	5.67
Ash	3.60	3.64	3.67	3.62	3.69	3.61	3.67
Calcium	1.71	1.71	1.73	1.70	1.72	1.69	1.72
Phosphorus	0.58	0.55	0.61	0.61	0.56	0.54	0.63
Energy (Kcal/Kg)	2520.55	2520.48	2520.61	2520.55	2520.58	2520.54	2520.58

*Vit./Min. Premix contains Vit. A, 10 000 000iu; D_3, 2 000 000iu; E, 12 500iu; K, 1.30g; B_1, 1.30; B_2, 4.00g; D Calcium-Pantothenate, 1.30g; B_6, 1.30g; B_{12}, 0.01g; nicotinic acid, 15.00g; folic acid, 0.05g; biotin, 0.02g; Co, 0.20g; Cu, 5.00g; Fe, 25.00g; I, 0.06g; Mn, 48.00g; Se, 0.10g; Zn, 45.00g; choline chloride, 200.00g; BHT, 50.00g.

MOLM = *Moringaoleifera* leaf meal

OGLM =*Ocimumgratissimum*leaf meal

MOLM/OGLM = *Moringaoleifera/Ocimumgratissimum*leaf meals

Experimental Diet (Laying phase)

The layer's diets are as shown in Table III and were fed to the experimental birds when they were about five percent (5%) in lay.

TABLE III: Experimental diets (%) for Laying phase (19 weeks and above)

		MOLM		OGLM		MOLM/OGLM	
Ingredients	0.0%	0.5%	1.0%	0.5%	1.0%	0.5%	1.0%
Maize	50.00	50.00	50.00	50.00	50.00	50.00	50.00
Soybean meal	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Palm kernel meal	17.90	17.90	17.90	17.90	17.90	17.90	17.90
Wheat offal	15.00	14.50	14.00	14.50	14.00	14.50	14.00
Bone meal	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Oyster shell	2.00	2.00	2.00	2.00	2.00	2.00	2.00
MOLM	0.00	0.50	1.00	0.00	0.00	0.25	0.50
OGLM	0.00	0.00	0.00	0.50	1.00	0.25	0.50
Lysine	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Methionine	0.25	0.25	0.25	0.25	0.25	0.25	0.25
*Vit/mineral premix	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Salt (Nacl)	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Total	100	100	100	100	100	100	100

Determined analysis (%)							
Crude protein	17.36	17.36	17.38	17.36	17.37	17.36	17.36
Ether Extract	3.96	3.97	3.97	3.97	4.00	3.92	4.10
Crude fibre	6.22	6.20	6.23	6.22	6.25	6.24	6.25
Ash	3.48	3.42	3.44	3.46	3.48	3.50	3.49
Calcium	1.70	1.70	1.71	1.70	1.71	1.71	1.73
Energy (Kcal/Kg)	2615.77	2615.77	2615.79	2615.76	2615.78	2615.79	2615.81

*Vit./ Min. Premix contains: Vits. A, 10 000 000iu; D_3, 2 000 000iu; E, 13 000iu; K_3, 1 500mg; B_{12}, 10mg; riboflavin, 5 000mg; pyridoxine, 1 300mg; thiamine, 1 300mg; D-Pantothenic acid, 8 000mg; nicotinic acid, 28 000mg; folic acid, 500mg; biotin, 40mg; Cu, 7 000mg, Mn, 48 000mg; Zn, 58 000mg; Fe, 58 000mg; Se, 120mg; I, 60mg; Co, 300mg; choline, 275 000mg; methionine, 20 000mg; BHT, 5 000mg

MOLM = *Moringaoleifera* leaf meal

OGLM =*Ocimumgratissimum*leaf meal

MOLM/OGLM = *Moringaoleifera/Ocimumgratissimum*leaf meals

Data collection

Data were collected on the following:

Egg Production parameters

i. Age at first lay**:** The number of days from hatch to the day the first egg was laid.

ii. Body weight of hen at first lay: This was determined as weight of each live pullet (average) per number of pullets' weight per group.

iii. Weight of first egg:Weight of each first egg averaged over the number of first eggs per group was measured with the use of a balance sensitivity of 0.01g.

iv. Hen-day egg production:Number of eggs collected divided by number of birds alive as at that day multiplied by 100.

Egg Quality Evaluation

Two eggs per replicate were taken for the evaluation of egg quality characteristics at the beginning of the laying period, and subsequently at four- week's interval.

Internal Qualities

The following parameters were measured:

i. Albumen height: The eggs were gently broken and the maximum albumen height was measured with tripod micrometer [7].

ii. Albumen weight: this was done after breaking the egg, the albumen was separated from the yolk with the aid of egg separator and was measured using Mettler top-loading weighing balance.

iii. % Albumen: This was calculated as the percentage of the albumen weight to the egg weight.

iv. Yolk weight: This was measured using Mettler top-loading weighing balance.

v. % Yolk: This was calculated as the percentage of the yolk weight to the egg weight.

vi. Haugh Unit (HU): This was calculated using the values obtained for the egg weight and albumen height as expressed enunciated by Asuquo *et al.*[3] in the formula shown below:

$HU = 100\log (H + 7.5 - 1.7W^{0.37})$

Where, H= Albumen height in mm

W= Egg weight in gram.

Meat qualities

The following data were collected on meat qualities of the experimental birds:

a) Chemical composition
b) Chilling loss
c) Cooking loss

Chemical composition

Meat samples were collected from the breast and thigh of the experimental birds and analysed for chemical composition according to [2]

Chilling Loss

Samples of meat from the breast and thigh muscles of the birds were labelled, weighed (50g), placed in polythene bags and put in a refrigerator for 24 hours. After refrigeration, each sample was weighed and the difference in weight was the chilling loss. The percentage weight loss was calculated as;

$$\%Weight\ Loss = \frac{Chilling\ Loss \quad x\ 100}{Initial\ weight}$$

Cooking loss

Samples of meat from the breast and thigh muscles of the birds were labelled, weighed (50g), placed in polythene bags and cooked at 70°C for 15 minutes. After cooking, the samples were allowed to cool to room temperature for 30 minutes and weighed again. The difference in weight was the cooking loss. The percentage weight loss was calculated as;

$$\%Weight\ Loss = \frac{Cooking\ Loss \quad x\ 100}{Initial\ weight}$$

Table IV: Effects of varying dietary levels of *M. oleifera*and *O. gratissimum* leaf meals on carcass characteristics of cockerels

Parameters	MOLM			OGLM		MOLM/OGLM	
	0%	0.5%	1.0%	0.5%	1.0%	0.5%	1.0%
Live Weight(g)	1353.87±73.14	1370.53±19.97	1380.70±30.10	1329.90±29.35	1400.13±72.64	1424.23±97.23	1526.03±10.03
Carcass Weight (%)	77.23±1.38	74.50±1.17	72.49±0.92	74.66±2.71	68.92±1.45	68.69±1.45	69.09±1.12
Dressing (%)	60.90±2.18	60.91±1.71	59.94±0.53	61.23±2.87	57.62±1.25	58.02±1.20	58.17±0.43
Drum Stick (%)	11.63±0.29	10.66±0.36	10.49±0.31	10.44±0.34	10.00±0.27	9.48±0.90	10.30±0.42
Back (%)	15.01±0.46	14.20±0.25	13.76±0.05	13.52±0.67	14.92±0.44	14.99±0.46	14.60±0.48
Abdominal Fat (%)	0.05±0.02	0.00±0.00	0.00±0.00	0.00±0.02	0.00±0.00	0.00±0.00	0.00±0.00
Small Intestine (%)	2.68±0.17	3.00±0.29	3.27±0.18	3.16±0.20	2.55±0.08	2.61±0.06	2.54±0.06
Large Intestine (%)	0.21±0.06	0.13±0.01	0.10±0.01	0.11±0.01	0.14±0.01	0.13±0.01	0.14±0.01
Spleen (%)	0.15±0.00	0.23±0.07	0.18±0.00	0.20±0.01	0.14±0.03	0.17±0.02	0.16±0.02
Heart (%)	0.48±0.04	0.41±0.02	0.51±0.00	0.46±0.04	0.47±0.04	0.41±0.06	0.42±0.07
Liver (%)	1.74±0.16	1.92±0.08	1.90±0.16	1.76±0.06	1.54±0.09	1.31±0.04	1.23±0.12
Gizard (%)	2.56±0.30	2.51±0.08	2.29±0.19	2.78±0.20	2.32±0.17	2.19±0.17	2.34±0.15
Muscle (%)	34.32±2.52	31.69±1.79	34.55±2.03	31.93±1.68	27.85±1.02	31.03±1.00	32.36±2.62
Bone (%)	21.62±2.13	20.64±0.86	20.19±3.33	19.14±1.10	18.57±1.48	16.61±0.43	17.33±2.23
Muscle-Bone	1.65±0.30	1.53±0.05	1.83±0.37	1.68±0.10	1.52±0.16	1.87±0.11	1.96±0.39

MOLM/ OGLM = *Moringaoleifera/Ocimumgratissimum* leaf meals

Table V: Effects of varying dietary levels of *M. oleifera*and *O. gratissimum* leaf meals on proximate composition of meat of cockerels

Parameters	MOLM		OGLM			MOLM/OGLM	
	0%	0.5%	1.0%	0.5%	1.0%	0.5%	1.0%
Moisture Content (%)	68.33±0.02	69.15±0.01	68.48±0.12	69.21±0.01	69.10±0.38	69.74±0.02	69.52±0.02
Crude Protein (%)	18.13±0.15	18.86±0.14	18.79±0.34	19.48±0.06	18.68±0.29	19.67±0.05	20.09±0.11
Ether Extract (%)	1.60±0.02	1.54±0.01	1.67±0.03	1.71±0.02	1.69±0.04	1.71±0.02	1.71±0.01
Ash (%)	1.63±0.01	1.32±0.01	1.27±0.02	1.37±0.02	1.33±0.05	1.38±0.02	1.45±0.01
Calcium (mg)	41.53±0.15	42.13±0.20	43.10±0.91	44.57±0.35	43.83±1.27	45.87±0.15	46.23±0.21
Phosphorous (mg)	182.28±0.20	183.38±0.24	183.93±0.88	186.20±0.21	185.43±1.57	187.17±0.20	187.00±0.21
Iron (mg)	2.37±0.15	3.10±0.12	2.67±0.32	4.36±0.15	4.07±0.99	5.80±0.17	6.80±0.21
Magnesium (mg)	15.27±0.23	16.13±0.15	16.37±0.62	17.63±0.26	17.17±0.99	18.50±0.38	19.30±0.21
Gross energy (KJ/Kg)	1.42±0.00	1.43±0.00	1.43±0.02	1.45±0.00	1.44±0.01	1.46±0.00	1.48±0.00

MOLM = *Moringaoleifera* leaf meal, OGLM = *Ocimumgratissimum* leaf meal, MOLM/ OGLM = *Moringaoleifera/Ocimumgratissimum* leaf meals

Table VI: Effects of Varying Dietary Levels of *M. oleifera* and *O. gratissimum* Leaf Meals on Proximate Analysis of Egg of Pullets

Parameters		MOLM		OGLM		MOLM/OGLM	
	0%	0.5%	1.0%	0.5%	1.0%	1.0%	0.5%
Moisture Content (%)	68.15±0.01	66.31±0.02	71.06±0.01	67.46±0.01	70.83±0.02	69.58±0.02	72.71±0.02

Crude Protein (%)	12.11±0.11	12.68±0.06	12.78±0.06	12.18±0.06	12.68±0.15	12.47±0.06	13.12±0.06
Ether Extract (%)	8.56±0.03	8.13±0.02	8.83±0.02	8.21±0.04	8.67±0.02	8.63±0.03	9.85±0.05
Ash (%)	0.91±0.15	0.81±0.01	0.95±0.01	0.94±0.15	1.12±0.15	1.12±0.05	0.94±0.01
Calcium (mg)	41.90±0.21	38.70±0.17	42.80±1.00	39.10±0.21	42.83±0.21	42.13±0.20	44.77±0.20
Phosphorous (mg)	178.87±0.15	171.90±0.12	184.50±0.20	173.30±0.09	184.27±0.10	183.97±0.18	196.87±0.23
Iron (mg)	2.07±0.15	1.87±0.15	3.03±0.18	1.97±0.12	2.53±0.15	2.30±0.11	3.30±0.11
Magnesium (mg)	15.33±0.15	14.93±0.15	16.30±0.12	15.30±0.15	15.93±0.12	15.93±0.20	17.80±0.11

Table VII: Effects of varying dietary levels of *M. oleifera*and *O. gratissimum* leaf meal on chilling and cook losses of meat of cockerels and egg-type chickens

Parameters	MOLM			OGLM		MOLM/OGLM	
	0%	0.5%	1.0%	0.5%	1.0%	0.5%	1.0%
Cockerels							
Chilling Loss (g)	0.27±0.03	0.23±0.09	0.27±0.07	0.27±0.07	0.23±0.03	0.23±0.03	0.20±0.00
ChillingLoss (%)	0.89±0.11	0.89±0.22	0.78±0.11	0.89±0.22	0.78±0.29	0.78±0.11	0.67±0.00
Cook Loss (g)	2.73±0.26	2.37±0.18	2.27±0.12	2.27±0.12	2.17±0.23	2.20±0.32	2.27±0.12
Cook Loss (%)	9.11±0.87	7.89±0.58	7.56±0.40	7.56±0.40	7.22±0.78	7.33±1.07	7.56±0.40
Egg-type Chickens							
Chilling Loss (g)	0.20±0.00	0.23±0.08	0.20±0.00	0.17±0.03	0.17±0.07	0.20±0.00	0.07±0.03
Chilling Loss (%)	0.67±0.00	0.78±0.29	0.67±0.00	0.56±0.11	0.56±0.22	0.67±0.00	0.22±0.11
Cook Loss (g)	3.37±0.32	2.90±0.06	3.27±0.81	2.67±0.17	2.00±0.46	2.40±0.06	2.57±0.38
Cook Loss (%)	11.33±0.19	10.89±2.70	10.89±2.70	8.89±0.56	6.67±1.53	9.67±0.19	8.56±1.25

MOLM/ OGLM = *Moringaoleifera/Ocimumgratissimum* leaf meals

III. DISCUSSION

The result of inclusion of *moringaoleifera* and *ocimumgrattissimum* leaf meal at varying proportion in the feed has good effect on the meat and egg of the birds. Table IV shows the qualities of the egg and other parameters, it revealed that 0% inclusion was the first to drop egg at exactly 19 weeks, other inclusions follows at 20 weeks indicating that they spent more time before dropping, the weight of the pullets shows that as at time of dropping only 0.5% OGLM has a lower weight compared with 0% inclusion, others have higher weight. The mix of 1% MOLM/OGLM has the best of the qualities in terms of egg weight, Albumen, Yolk size and some other qualities.

Tables IV shows effect of varying dietary level of MOLM and OGLM on carcass of egg-type chicken and Cockerels, the mix of 1% MOLM/OGLM has the highest weight of live bird of 1526g and less percentage of carcass while 0% inclusion has highest of carcass 77.23%. Also the abdominal fat is reduced at 0% in all the inclusions, the meaty part of bird like the breast in for 1% MOLM/OGLM of 17.74% and thigh 8.89% were higher compared with 0% inclusion with 13.68% and7.27% respectively. The table also shows that the percentage of large, small intestine and spleen in 1% inclusions are 2.08, 0.27 and0.10% respectively were lower compared with 0% inclusion 0.11%, most of other inclusions follow the trend. The bone% is lower in 1% inclusion MOLM/OGLM but lowest in 1% MOLM, this does not mean a weak bones but less of bone weight, it shows that there is more of meat and less of bones in the birds.

The result in tables V and VI show proximate of meat from cockerel and egg of pullet in the experiment. The moisture content of mix of MOLM/OGLM in the two tables have higher percentage of 69.74 and 69.52 for meat of cockerel while egg of pullet has 70.41, these values are higher than moisture content of 0% inclusion of 68.33 and 68.51% in tables 7 and8 respectively. The percentage protein in meat of cockerel is more in the inclusion and highest in 1% inclusion of MOLG/OGLM of 20.09%, close to this value is 5% inclusion of MOLM/OGLM, others have their percentage range from 18.79 to 19.48 which is higher than 0% inclusion.The result is in line with the result of copmposition of broiler meat by Oliveira et al [13]. The proximate components determined were significantly ($P < 0.05$) affected by the leaf meals inclusion for egg of pullet. Moisture content of the egg increased across the leaf meals 66.31% for birds on MOLM leaf meal to 67.46% for birds on OGLM leaf meal and 72.71% for birds on MOLM/OGLM. Crude protein of egg for birds on MOLM 12.68% was statistically the ok with 13.12% for birds on MOLM/OGLM while it was low 12.18% for birds on OGLM. Ether extract for birds on MOLM 8.13% was statistically the same with 8.21% for birds on OGLM but high 9.85% for birds on MOLM/OGLM. Ash content for birds on MOLM 0.81% was lower than 0.94% for birds on OGLM and MOLM/OGLM. Calcium and phosphorous, followed similar trend as ether extract. Iron was high 3.30mg for birds on MOLM/OGLM followed by 3.03mg for birds on MOLM and least 1.97mg for birds on OGLM.This proximate result of egg shows is better than 0% inclusion which further justifies these inclusions.

The calcium result in table V shows that MOLM/OGLM with 1% inclusion is with 46.23mg next to it in amount is 5% inclusion with 45.87mg, others range between 42.13 and 44.57mg which Is higher than 0% inclusion. The result of Phosphorus is similar to Calcium with MOLM/OGLM with highest milligram of 187.17, 0% inclusion is 182.28 while other inclusions have a range of 183.38 and 187mg. Similar trend is the result of Iron on the same table 7 with MOLM/OGLM 1% inclusion is 6.80mg which is much higher than 0% inclusion of 2.23mg and others have a range of 2.67 and 5.80mg. The result of magnesium content shows that 0% inclusion is 15.27mg, other inclusions have more of as the values ranged between 16.13and 19.30mg. In table VI the results further consolidates results from the previous tables which reveals good qualities of inclusions of MOLM/OGLM, for moisture content 1% inclusion for MOLM is 71.06% and for OGLM it is 70.83%, MOLM/OGLM has the highest percentage of 72.71%,0% inclusion is 68.15%. The crude protein of the eggs of pullet shows a similar trend of inclusion of MOLM/OGLM with best of all with 13.12%, 1% inclusion of MOLM is12.78%, while that of OGLM is 12.68% and for their 0.5% inclusions are12.68 and 12.18% respectively. All these have better percentage compared with 0% inclusion that has 12.11%. Calcium content in the egg of pullet as shown in the result, 0% contains 41.9mg and it is the least of the options, 0.5% inclusion of MOLM/OGLM has the highest calcium content of 44.77mg, other inclusions have from 38.70 to 42.80mg. Phosphorus content of the egg of pullet result shows a similar trend 0.5% inclusion of MOLM/OGLM contains 196.87 and its 1% inclusion contains 183.97mg, for 1% inclusions of MOLM and OGLM are 184.5 and 184.27mg respectively which are higherthan 0% inclusion of 178.87mg. Iron 0.5%inclusion of MOLM/OGLM has the highest of 3.3mg, 1% inclusions were 3.03, 2.53 and 2.30 for MOLM, OGLM and MOLM/OGLM respectively. The milligram of magnesium in the egg of pullet fed with 0.5% inclusion of MOLM/OGLM is 17.80, 1% inclusion of MOLM contains 16.30mg magnesium in the egg, while 1% inclusion of OGLM and MOLM/OGLM are both 15.93mg.

Table VII shows the chilling and cooking losses of both the cockerel and egg type chicken, in the result more percentage losses were recorded for 0% inclusion while lesser losses were to the inclusions. Cockerel chilling loss shows that 0% inclusion is 0.89% while other inclusions ranged from 0.67 to 0.89%. Cook loss for 0% inclusion is 9.11% and others ranged from 7.22 to 7.89% which are lesser than that of 0% inclusion. This is another good quality of this leaf meal in feeds; it reduces losses in cooking and chilling. For egg type Chicken 0% inclusion has 0.67% chilling loss and real inclusions ranged from 0.22 to 0.78%. Cook loss 0% inclusion which serves as control has 11.33% and others ranged from 6.67 to 19.89%.

IV. CONCLUSION

The effects of varying dietary levels of *moringaoleifera* and*ocimumgratissimum* leaf meal on feeds have good qualities from chicken. These qualities include the quality of carcass, minerals which better than that of the control (0% inclusion of the leaf meals), the thickness of the shells is improved.

The fleshy /meaty parts of the bird fed with varying levels of the leaf meal have more percentage of the thigh and breast also they have less of the bones compared with the control. The abdominal fat, small and large intestine, spleen, and liver have reduced percentage, while the heart, gizzard and muscles were of better percentage.

The proximate composition of meat of cockerel and egg of pullet were better in terms of protein and mineral content and this is of nutritious advantage to consumer of such meat and egg. Losses due to chilling and cooking were reduced in the meat of birds fed with varying inclusions of the leaf meals.

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