EFFECT OF FEEDING YEAST (*Saccharomyces cerevisiae*) AS A PROBIOTIC IN CASSAVA BASED DIETS ON THE NUTRIENT UTILIZATION OF BROILERS

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Abstract
One hundred and twenty (120) Anak broilers were used to evaluate the effect of feeding yeast (S*accharomyces cerevisiae*) as a probiotic in a-cassava based diets on the nutrient utilization of broilers. Birds of one (1) week of age were weighed and randomly assigned to four (4) dietary treatment formulated to contain the test ingredient probiotic (*Saccharomyces cerevisiae*) at 0 %, 0.5 %, 1.0 % and 1.5 % diatary inclusion levels. Thirty (30) birds allotted to each of the treatment and the treatments were replicated three times. Feed and water were provided *ad libitum* for the seven (7) weeks duration of the experiment. It was a completely randomized design (CRD) experiment.. Result show that there were no significant differences (P>0.05) in final live weight, average daily weight gain, average daily feed intake and feed conversion ratio among the treatments. The implication of these results is that those parameters measured were not significantly (P>0.05) influenced by the dietary levels of the probiotic (*Saccharomyces cerevisiae*). Also decreasing feed production cost (₦75.57/kg, ₦75.06/kg, ₦74.74/kg and ₦74.55/kg for diets I, II, III and IV respectively) was observed as inclusion level of the Probiotic (*Saccharomyces cerevisiae*) increased from 0 to 1.5 %. Breast, leg, gizzard, neck, liver and heart weight were increased across the treatments. Wings and abdominal fat weight were decreased with increase in the inclusion level of probiotic (*Saccharomyces cerevisiae*) from 0-1.5 %. Hence, it can be concluded that
yeast (*Saccharomyces cerevisiae*) can included up to 1.5 % in the diet of broilers without any negative effect on their growth performance, and carcass characteristics. There was decrease in ₦/kg production cost with increase inclusion level of Yeast (*Saccharomyces cerevisiae*) in the diets.

Keywords: Yeast, Cassava Diets, Broilers, Nutrient Utilization

Introduction

Probiotic is defined as microorganisms that are believed to provide health benefits when consumed. In many parts of the world, feed additives, such as probiotics and prebiotics, are being experimented upon to alleviate the problems associated with the withdrawal of antibiotics from feed. Probiotics are biological products, which stimulate the immune system and increase its defensive activity against pathogenic bacteria. Probiotics competitively exclude *Salmonella* bacteria from the intestinal tract of the treated chickens. *Saccharomyces cerevisiae* is one of the most widely commercialized types of yeast, and has long been fed to animals. Results of earlier studies with yeast fed to chickens, however, have not been consistent. It has been reported (Ignacio, 1995; Onifade *et al*., 1999; and Spring *et al*., 2000) that feeding yeast to chicks improves body weight gain and feed/gain ratio. The bacterial populations in the gut of birds were altered when micro-organism were added to their diets. The intestinal bacterial flora of domestic animals has an important role in digestion and absorption of feed ingested by the host. It takes part in the metabolism of dietary nutrients such as carbohydrates, protein, lipids and minerals and also in the synthesis of vitamins. This study is aimed at investigating the effect of different levels of inclusion of yeast (*Saccharomyces cerevisiae*) on the growth performance, carcass characteristics and economics of production of broilers.

Materials and Methods

Cassava Root Processing

Fresh cassava roots (12 months old, variety Umucas 1368) were washed to dislodge all adhering soil, immediately after harvest and chipped with chipping machine at the Garri Processing Unit of the National Root Crops Research Institute (NRCRI), Umudike. The chips were dewatered with hydraulic pressing machine for 24 hours. This method of processing of the cassava root meal had been described by Okereke *et al.*, 2012. Thereafter, it was sun dried on a clean nylon mat for five-six days, milled and stored in a bag for the feeding trial.

Experimental Diets

The study was conducted at the Poultry Farm of Collage of Animal Science and Animal Health, Michael Okpara University of Agriculture, Umudike. One hundred and twenty (120) Anak broiler birds of one (1) weeks of age were weighed and randomly assigned to four (4) dietary treatment formulated to contain the test ingredient probiotic (*Saccharomyces cerevisiae*) at 0 %, 0.5 %, 1.0 % and 1.5 % dietary inclusion levels. Thirty (30) birds were allotted to each of the treatments each treatment was replicated three times. All other ingredients remain constant except maize and soybean meal. The birds were placed on a commercial broiler starter mash for one week before the experiment on a deep litter system. Feed and water were provided *ad libitum* for the seven (7) weeks duration of the experiment. Body weights were taken at the onset of the experiment and thereafter on weekly basis. Feed intake was taken daily by subtracting the weight of left over feed from the weight of the feed given. Weight gain was calculated from body weights, while feed conversion ratio was calculated from feed intake and weight gain.

Table 1: Composition of the Experimental Diets

Ingredients	I (0%)	II (0.5%)	III (1%)	IV (1.5%)
Maize	41.74	38.81	37.00	35.39
Cassava root meal	10.00	10.00	10.00	10.00
Saccharomyces cerevisiae	0.00	0.50	1.00	1.50
Soybean meal	20.06	22.49	23.69	24.91
Groundnut Cake(GNC)	12.00	12.00	12.00	12.00
Wheat offal	5.00	5.00	5.00	5.00
Palm Kernel cake (PKC)	5.00	5.00	5.00	5.00
Fish meal	2.50	2.50	2.50	2.50
Bone meal	3.00	3.00	3.00	3.00
Salt	0.25	0.25	0.25	0.25
Vitamin premix*	0.25	0.25	0.25	0.25
Lysine	0.10	0.10	0.10	0.10
Methionine	0.10	0.10	0.10	0.10
Calculated value				
Crude Protein (CP) %	22	22	22	22
Crude Fibre (CF) %	4.52	4.39	4.25	3.99
Metabolisable Energy kcal/kg	2868.60	2821.80	2798.48	2775.00

*Provide the following per kg of feed: Vit A 10 000 000 iu; Vit D3 2 000 000 iu; Vit B1 0.75 g; Vit B2 5 g; Nicotinic acid 25 g; Calcium pantothenate 12.5 g; Vit B12 0.015 g; Vit K3 2.5 g; Vit E 25 g; Biotin 0.05 g; Folic acid 1 mg; Choline chloride 250 g; Co 0.4 g; Cu 8 g; Mn 64 g; Fe 32 g; Zn 40 g; I 0.8 g; Flavomycin 100 g; Spranycin 5 g; 3-Nitro 50 g; DL-Methionine 50 g; Se 0.16 g; L-Lysine 120 g; BHT 5 g.

Chemical and Data Analysis

Proximate analysis of pro-vitamin A rich cassava root meal was carried out using a standard method (AOAC, 1990). The crude protein content was calculated by multiplying the nitrogen content by 6.25. All results were subjected to one-way analysis of variance for completely randomized design experiment

(CRD) according to the procedure of Steel and Terrie (1980), while differences between treatment means were separated using LSD.

Cut Parts and Organ Weights

At the end of the experiment, two birds per replicate were randomly selected, starved for 24 hours, weighed and slaughtered by serving the jugular vein. They were bled thoroughly, scalded in hot water and defeathered. The defeathered birds were then weighed. The head, neck, shank and visceral were separated from the carcass and the dressed weight taken. Each dressed carcass was cut into parts as reported by Ojewola and Longe (1999) for the purpose of carcass evaluation. All parts such as breast, drumstick, thigh, wings and backcut were weighed and expressed as percentage dressed weight. Organs like liver, heart and gizzard were also weighed and expressed as percentage of live weight.

Results and Discussion

Composition of the Experimental Diets

Table 1 shows the compositions of the experimental diets: it has similar crude protein level of 22 % but the energy content differed. As the level of maize decreased across the diet, the caloric values of the diet decreasesed. The chemical composition of pro-vitamin A rich cassava root meal is presented in Table 2. The crude protein (2.10 %), crude fibre (3.43 %), ether extract (1.02 %), ash (3.15 %) and NFE (81.80 %) are comparable to those of Oyenuga (1978) who worked on cassava root meal.

Table 2: Chemical composition of pro-vitamin A rich cassava root meal

Parameter	Composition
Crude protein	2.10%
Crude fibre	3.43%
Lipids/fat	1.02%
Ash	3.15%
Nitrogen Free Extract (NFE)	81.80%
Metabolisable Energy (ME)	3200Kcal/g
Hydrogen Cyanide (HCN)	14.49mg/g

Growth Performance

The growth performance of broilers fed diets containing diffent levels of probiotic (*Saccharomyces cerevisiae*) at 0, 0.5, 1.0, and 1.5 % dietary inclusion levels showed that there were no significant differences ($P<0.05$) in final live weight, average daily weight gain, average daily feed intake and feed conversion ratio among the treatments (Table 3). The implication of these result is that those parameters measured were not significantly ($P>0.05$) influenced by the dietary levels of the probiotic (*Saccharomyces cerevisiae*).

Table 3: Performance of broilers fed probiotic (*Saccharomyces cerevisiae*).

Parameters	I (0%)	II (0.5%)	III(1.0)	IV(1.5)	LSD
Initial Live weight (g)	35.70	35.70	35.70	35.70	0.04
Final Live weight (g)	750.13	760.10	770.63	770.47	3.97
Average daily weight gain (g)	15.30	15.50	15.80	15.90	0.08
Average daily feed intake (g)	104.01	106.10	107.06	105.14	0.04
Feed conversion ratio	6.80	6.85	6.78	6.61	0.04
Feed cost (₦/kg)	75.57	75.06	74.74	74.55	-
Mortality	0	0	0	0	-

Decreasing feed production cost (₦/kg) (75.57, 75.06, 74.74 and 74.55 naira) was observed as inclusion level of Probiotic (*Saccharomyces cerevisiae*) increased from 0 to 1.5 % (Table 3).

Carcass characteristics

Table 4 represents breast, leg, gizzard, neck, liver and heart weight was increased across the treatments. Wings and abdominal fat weight was decreased with increase in the inclusion level of probiotic (*Saccharomyces cerevisiae*) from 0-1.5% of *Saccharomyces cerevisiae.* The result agreed with, Kalavathy *et al*., (2003) who made similar observation that supplementation of *Saccharomyces cerevisiae* reduces abdominal fat.

Table 4: Effect of different levels of yeast (Saccharomyces cerevisiae) on carcass weight of broiler chicks

Organ	I (0%)	II (0.5%)	III (1%)	IV (1.5%)
Breast weight	570	653	628	678
Leg weight	471	414	423	437
wings weight	153	147	132	89
Gizzard	32	30	32	37
Neck weight	51	57	58	59
Liver weight	35	40	40	42
Heart weight	7	8	9	11
Fat weight	39	33	26	20

Conclusion and Recommendations

Yeast (*Saccharomyces cerevisiae*) can be included up to 1.5 % in the diet of broilers without any negative effect on their growth performance and carcass characteristics. There was decrease in ₦/kg production cost with increase in quantity of Yeast (*Saccharomyces cerevisiae*) in the diets.

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