

HAEMATOLOGICAL AND BIOCHEMICAL CHARACTERISTICS OF BROILERS FED GRADED LEVELS OF DRY DISTILLED CASSAVA WITH SOLUBLE (DDCS)

BY

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INTRODUCTION

- Nigeria advocates the use of alternative and sustainable fuel source
- There is a need to research into the potential use of the waste product from this fuel industry
- Dry Distilled Cassava with Soluble (DDCS) is an unconventional feed – a waste product from the fermentation and distillation process of cassava in ethanol production (Mahmud *et al.*, 2016)
- Adenkola *et al.*, 2011 reported the importance of dietary constituents and its effects on blood components and constituents
- Hence, this study was designed to evaluate the effect of graded levels of DDCS on the haematology and biochemical profiles of broiler of chickens

OBJECTIVES OF THE STUDY

- To determine the chemical composition of dry distilled cassava with soluble (DDCS)
- To evaluate the effect of graded levels of DDCS on the haematology and biochemical profiles of broiler of chickens.

MATERIALS AND METHODS

- **Experimental site:** The experiment was conducted at the poultry section of the Bioresources Development Centre (BIODEC), Ogbomoso
- **Experimental material:** The DDCS used in this study was obtained from Bio-ethanol Production Plant of National Biotechnology Development Agency (NABDA), located in BIODEC, Onipannu, Ogbomoso, Nigeria

SAMPLE PREPARATION

- The samples were collected into jute bags from ethanol production plant using the outlet faucet (hose) of the storage tank
- The water was allowed to drain out then sundried for two days and air dried for two days
- The processed samples were stored in a sack at room temperature prior to proximate analysis by standard methods (AOAC, 1990)
- **Experimental diets:** Four dietary treatments were formulated with 0, 4, 8 and 12% DDCS inclusion (Table 3)

Experimental animal and management

- One hundred and forty four (144) 5-week un-sexed Arbor acre strain broiler chicks were randomly allotted into four treatments with thirty six (36) birds per treatment
- The chicks were reared in brooder house for the first 28days (0 - 4 weeks) after which they were allotted to dietary treatments
- Each treatment was replicated twice in a completely randomized design
- At the end of the feeding trial, the birds were starved overnight so as to empty the crop
- Four birds were selected randomly, weighed and blood sample collected via jugular puncture
- 5ml of blood sample each was collected into well labeled plain and EDTA bottles

- The blood sample in the EDTA-containing bijou bottles were processed for haematology while those in bottles without EDTA were processed for biochemical analysis (Baker and Silverton, 1976; Mitruka and Rawnsley (1977))
- Data obtained were subjected to analysis of variance (ANOVA) using SAS Statistical Package, SAS 2008. The means were separated using Duncan multiple range test

RESULTS AND DISCUSSION

Table 1: Chemical composition of dry distilled cassava with soluble (DDCS)

Parameter	DDCS
Dry matter (DM)	85.52
<u>Analysis % of DM</u>	
Organic matter	94.54
Crude protein	9.88
Crude fibre	45.09
Ether extract	0.35
Ash	5.46
Nitrogen free extract	24.74

Table 2: Anti-nutritional factors of dry distilled cassava with Soluble (DDCS)

Parameter	DDCS
Saponin (%)	0.05
Alkaliod (%)	0.09
Flavonoid (%)	0.03
Tannin (mg/100g)	0.43
Polyphenol (mg/100g)	0.12
Cyanide (mg/kg)	15.14
Phytate (mg/g)	79.83
Oxalate (mg/g)	0.71

DDCS :Dry Distilled Cassava With Soluble

Table 3: Gross Composition of experimental diets

Ingredients	0%	4%	8%	12%
	DDCS	DDCS	DDCS	DDCS
Maize	54.75	54.75	54.75	54.75
Soybean meal	28.00	28.00	28.00	28.00
Wheat offal	12.00	8.00	4.00	-
DDCS	-	4.00	8.00	12.00
Bone Meal	3.00	3.00	3.00	3.00
Oyster shell	1.50	1.50	1.50	1.50
Salt	0.20	0.20	0.20	0.20
Vitamin Premix	0.25	0.25	0.25	0.25
Lysine	0.15	0.15	0.15	0.15
Methionine	0.15	0.15	0.15	0.15
Total	100.00	100.00	100.00	100.00
Calculated % CP	19.65	19.71	19.41	19.10
Metabolizable energy (Kcal/Kg)	2,874.22	2,789.42	2,714.62	2,639.82
Crude fibre (%)	3.73	4.97	6.17	7.38

DDCS : Dry Distilled Cassava With Soluble

Table 4 : Hematological parameters of broilers fed graded levels of dry distilled cassava with soluble

Parameter	0% DDCS	4% DDCS	8% DDCS	12% DDCS	SEM	PROB
WBC(x10 ⁹ /L)	109.98	106.23	105.98	101.50	2.44	0.74
RBC (x 10 ¹² /L)	2.33	2.14	2.11	2.23	0.04	0.14
PCV (%)	30.25	30.33	29.75	31.33	0.71	0.92
MCV (fl)	119.38	121.03	121.93	122.93	0.65	0.26
MCHC (g/dL)	7.28	7.40	7.98	7.03	0.28	0.71
MCH (pg)	8.95	8.00	10.64	8.80	0.43	0.14

a, b, c, d : Means within each row with different superscript are significantly different (p< 0.05)

SEM = Standard error of mean, PROB = Probability

DDCS :Dry Distilled Cassava With Soluble

Table 5: Serum metabolites of broilers fed graded levels of dry distilled cassava with soluble

Parameter	0% DDCS	4% DDCS	8% DDCS	12% DDCS	SEM	PROB
Total protein (g/l)	34.50	38.33	33.25	30.00	1.31	0.28
Albumin (g/l)	9.28	10.70	10.93	13.13	0.65	0.24
Globulin (g/l)	25.23	27.63	22.33	16.90	1.43	0.10
Creatinine (umol/l)	46.25	71.33	61.00	51.00	5.39	0.42
AST (IU/L)	87.25	87.00	92.75	84.33	2.25	0.65
ALT (IU/L)	1.83	2.57	1.88	2.73	0.37	0.80
Cholesterol (mmol/L)	2.40	2.63	2.30	2.83	0.09	0.15
Tryglyceride (mmol/L)	0.43	0.27	0.43	0.23	0.04	0.26
HDL (mmol/L)	1.80	1.87	1.75	2.10	0.06	0.23
LDL (mmol/L)	0.41	0.67	0.35	0.63	0.07	0.24
Uric acid (mmol/L)	0.48	0.38	0.46	0.35	0.03	0.47

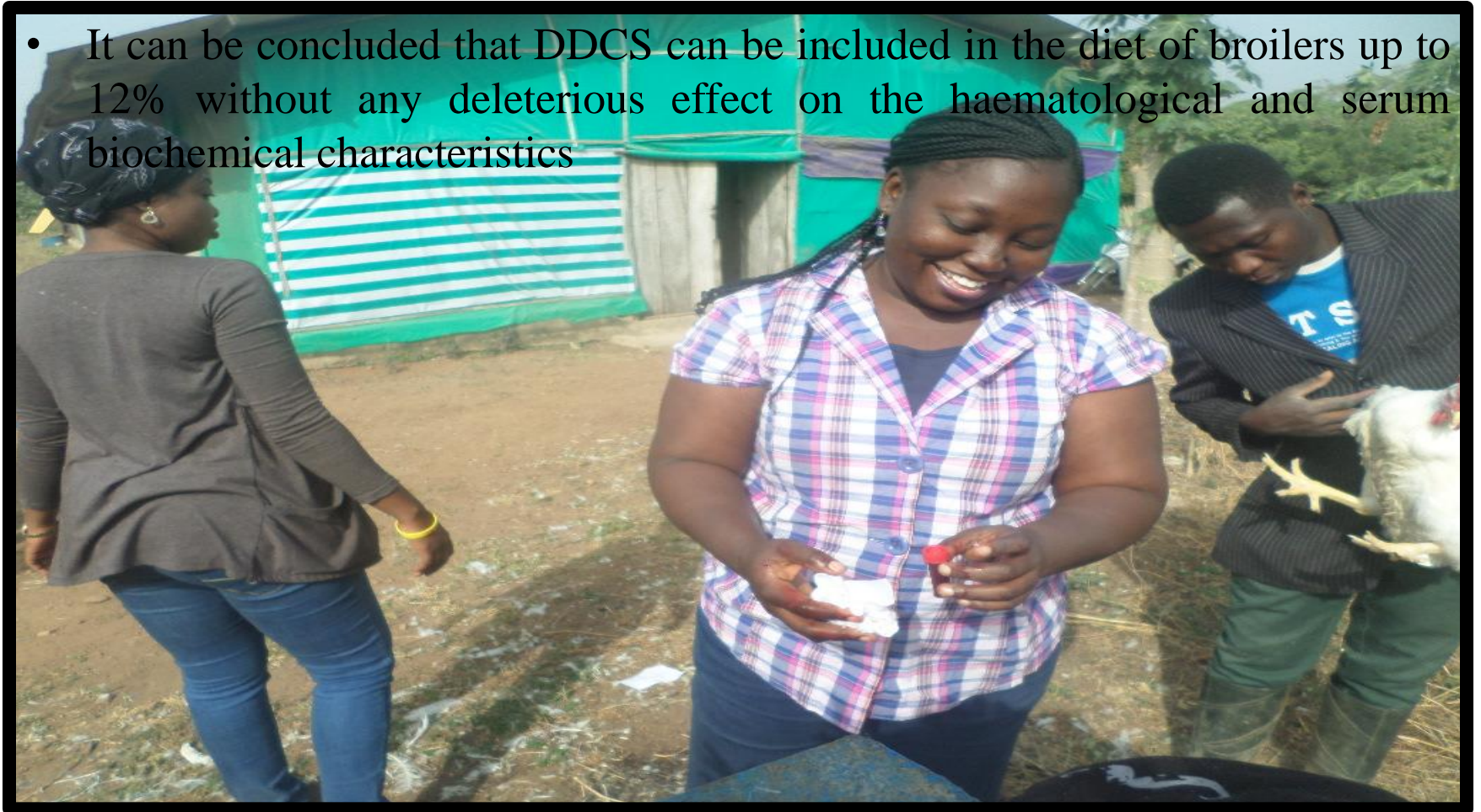
a, b, c, d : Means within each row with different superscript are significantly different (p< 0.05)

SEM = Standard error of mean, PROB = Probability

DDCS :Dry Distilled Cassava With Soluble

Conclusion

- It can be concluded that DDCS can be included in the diet of broilers up to 12% without any deleterious effect on the haematological and serum biochemical characteristics



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A photograph of a man in a white shirt and tie sitting at a blue table outdoors. The table is set with a yellow plate of food, a white cup, and some papers. In the background, a woman in a patterned dress is carrying a child on her back. The scene is set in a rural, open area with trees and a clear sky.

**THANK YOU
FOR
LISTENING**