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PHYTOCHEMICAL PROPERTIES OF PROCESSED SENNA SEED (*Senna occidentalis* L.) AND ITS INFLUENCE ON SERUM BIOCHEMICAL INDICES IN BROILER CHICKENS

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INTRODUCTION

❖Animal feed accounts about 60-70% of cost of production (Etuah *et al*., 2021)

❖The rising cost and competitive nature of conventional plant protein ingredients drives for alternative sources (Pexas *et al*., 2023)

❖Senna seed (*Senna occidentalis*) meal (SSM) has CP of about 20-30% (Kontan *et al*., 2019)

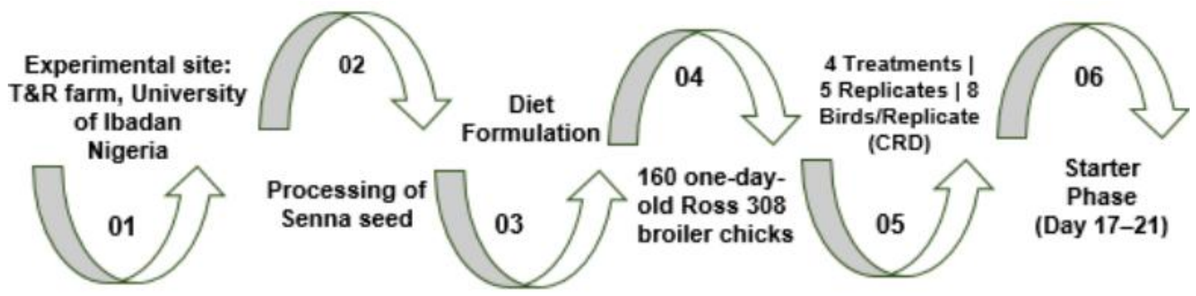
❖But despite its rich nutritional profile, SSM contains ANFs which may limit nutrient utilisation in broiler chickens

OBJECTIVES

❖To assess the qualitative and quantitative phytochemicals in raw and processed senna seed meal

❖To evaluate the effect of senna seed meal-based diets on serum biochemical indices of broiler chickens

MATERIALS AND METHODS



EXPERIMENTAL LAYOUT

Treatment I: HDP + 0% SBM +0% SSM

Treatment II: Basal diet + 90% SBM +10% RSSM

Treatment III: Basal diet + 90% SBM +10% FSSM

Treatment IV: Basal diet + 90% SBM +10% BSSM

HDP: Highly Digestible Protein
SBM: Soyabean Meal
RSSM: Raw Senna Seed Meal
FSSM: Fermented Senna Seed Meal
BSSM: Boiled Senna Seed Meal

PROCESSING METHODS

FERMENTATION	BOILING
☐ **Clean** raw senna seeds (500g)	☐ **Clean** thoroughly
☐ **Soak** in 1.5L clean water for 1 hour	☐ **Boil** seeds (500g) in 2.5L of water for 1 hour
☐ **Ferment** anaerobically at 30–37°C for 5 days.	☐ **Sun-dry** and store in airtight container
☐ **Dry** and store in airtight container	
Augustine *et al*. (2017)	Augustine (2018)

PARAMETERS ASSESSED

❖**Phytochemical screening:**

➢Qualitative and quantitative analysis of raw and processed SSM

❖ **Serum Enzymes:**

➢Total protein (TP), Albumin (ALB), Globulin (GLO), Aspartate aminotransferase (AST), Alanine aminotransferase (ALT), Alkaline phosphatase (ALP), and creatinine were measured

❖**Statistical analysis**

➢Data were subjected to descriptive statistics and ANOVA using SAS software package and means separated using Tukey's HSD test at α0.05

RESULTS & DISCUSSION

Table 1: Qualitative analysis of the phytochemicals in raw and processed *Senna occidentalis* seed meal

Phytochemicals	BSSM	FSSM	RSSM
Saponins	+ve	++ve	++ve
Tannins	+ve	++ve	++ve
Flavonoids	++ve	++ve	++ve
Cardiac glycosides	+ve	++ve	++ve
Anthraquinones	+ve	+ve	++ve
Terpenoids	++ve	++ve	+ve
Steroids	+ve	++ve	+ve
Alkaloids	++ve	++ve	++ve
Phenols	+ve	++ve	++ve

RSSM = Raw Senna Seed Meal, FSSM = Fermented Senna Seed Meal, BSSM = Boiled Senna Seed Meal, +ve = present, ++ve = abundantly present.

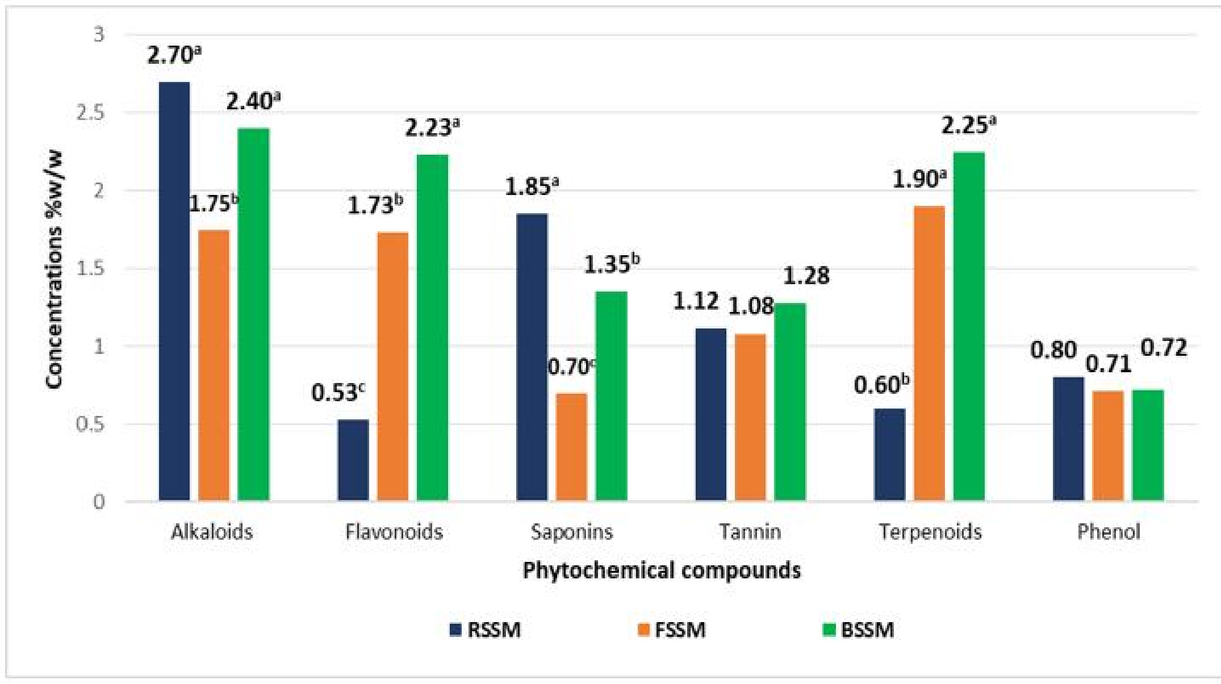


Figure 3: Quantitative phytochemical composition (% w/w) of raw and processed *Senna occidentalis* seeds

Table 2: Serum biochemical indices in broiler chickens fed processed senna seed-based diet

Parameters	HDP diet	Basal diet +10% RSSM	Basal diet +10% FSSM	Basal diet +10% BSSM	SEM	Pvalue
TP (g/dL)	3.33b	3.43b	3.50b	3.77a	0.05	0.010
ALB (g/dL)	0.73b	0.73b	0.83b	1.03a	0.12	0.024
GLO (g/dL)	2.60	2.70	2.67	2.73	0.05	0.832
ALB:GLO	0.28ab	0.28b	0.31ab	0.39a	0.02	0.114
AST(U/L)	67.65	68.84	83.19	85.15	3.16	0.079
ALT (U/L)	20.00	20.33	19.67	20.67	0.20	0.330
ALP (U/L)	69.67	111.78	122.56	126.89	9.82	0.106
UREA (mg/dL)	3.11b	3.83a	3.43ab	3.12b	0.10	0.010
CREAT (mg/dL)	0.50	0.53	0.47	0.53	0.01	0.291

abcd Means on the same row with different superscripts are significantly (P<0.05) different. RSSM = Raw Senna Seed Meal, FSSM = Fermented Senna Seed Meal, BSSM = Boiled Senna Seed Meal, HDP = Highly Digestible Protein, TP = Total Protein, ALB = Albumin, GLO = Globulin, ALB:GLO = Albumin-Globulin ratio, AST = Aspartate Aminotransferase, ALT = Alanine aminotransferase, ALP = Alkaline phosphatase, CREAT = Creatinine

CONCLUSION

❖The nutritional quality of SSM was significantly improved by fermentation and boiling

❖The integrity of the liver or kidney was maintained

CONTRIBUTION TO KNOWLEDGE

❖Processing lowered the harmful effects of ANFs and made SSM a more valuable and safe alternative

❖Processed SSM can be safely incorporated at a dietary inclusion level of 10% in broiler diets without compromising overall health

REFERENCES

Etuah, S., Mensah J.O. Aidoo, R. Musah E.F. Botchwey F. Oppong Adjei L. and Owusu K. 2021. Financial viability of processing broiler chicken into cut parts in Ashanti region of Ghana. *Cogent Food Agric* 7.1: 1917742

Kontan, D. D., Yusuf, H. B., Shaahu, D. T., Nyameh, J. and Antyev, M. 2019. Nutritional evaluation and histopathological assessment of unprocessed *Senna occidentalis* (Coffee Senna seed meal) in broiler chicks. *Nigerian Journal of Animal Science* 21.1: 72-79

Pexas, G., Doherty, B. and Kyriazakis, I. 2023. The future of protein sources in livestock feeds: implications for sustainability and food safety. *Frontiers in Sustainable Food Systems* 7: 1188467.