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Effects of Raw and Processed *Sennaobtusifolia*Seed Meals onThe Growth Performance, Carcass Characteristics and Blood Profile of Weaner Rabbits

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Abstract
The study was carried out to evaluate the Effects of Raw and Processed Sennaobtusifolia Seed Meals on the growth performance, carcass characteristics and blood profile of weaner rabbits. Forty weaner rabbits were randomly assigned to five dietary treatments containing 10% of raw,10% toasted,10%sprouted,10% boiled and 10% fermented in a completely randomized design with 8 rabbits per treatment replicated 4 times with 2 rabbits per replicate.The result of the proximate composition of raw and differently processed Sennaobtusifolia seeds showed crude protein range of 23.04 in raw to 25.13% in fermented. Dry matter ranged from 90.30-92.20%. The content of saponin, tannins and alkaloids decreased in concentration as the seed was subjected to processed methods. The result of growth performance showed that final body weights, average daily weight gain, total feed intake and average daily feed intake were significantly (P<0.05) influenced. Feed conversion ratio also significant with the best in fermented fed rabbits. Dressing % , dress weight were significant (P<0.05) best in T5 at 57.88% as against T1 at 47.42% .Haematological parameters of PCV, Haemoglobin, MCV,MCHC showed significance (P<0.05) with better concentrations in the fermented (T5)and other processed. White blood cells were also significant (P<0.05) with higher concentrations in the raw (T1).Digestibility was significant for Dry matter, Crude protein, Crude fibre, Ether extract, Ash, and nitrogen free extracts with T5 followed by other processing methods. It can therefore be concluded that fermented Sennaobtusifolia processing method gave the best result and be used in weaner rabbit feeding

Keywords:*Rabbits, Processing Sickle seed (Sennaobtusifolia)methods, growthperformance, carcass characteristics and blood profile.*

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I. Introduction

In recent times there has been a significant short fall between the production and supply of animal protein to feed the ever increasing population (FAO, 2012). To arrest this unacceptable trend, efforts have been directed towards boosting the animal industry with micro-livestock having prolific tendency, short gestation period, short generation interval and rapid growth. Among the micro-livestock animals is the domestic rabbit (*Oryctolaguscunninculus)* which has the potential to become one of the most important livestock species in many developing countries like Nigeria. Therefore, the intensification of micro – livestock and short cycle animal's production has been suggested. Rabbits are not in direct competition with man for food and can be produced on forages and agro- industrial by products.

Over the years, the rearing and production of mini-livestock and other animal species have been plagued by the challenges of feeding and availability of feeds. Most of the conventional feed ingredients are highly demanded for human nutrition thereby creating a tacit competition between man and animals; leading to expensive feed ingredients that may not be afforded by poor livestock farmers. In view of the above, it has become imperative to focus research on the utilization of certain novel legume seeds as alternative cheaper protein feedstuff for livestock. *Sennaobtusifolia* could be such an ideal alternative. *Sennaobtusifolia* is a legume weed that belongs to the family *leguminosae* and sub-family of *caesalpioideae L.* The legume weed is considered a competitive weed in farmlands, but there are evidences that their seeds can be utilized in feeding of livestock especially monogastric animals (Augustine *et al*., 2014).The authors also concluded that the use of *Sennaobtusifolia* seed has good economic potentials as feed ingredient for broiler chicken. It contains 19-29% protein; 28% lipid, 45-51% nitrogen free extract (NFE) and 19-32kjg $^{-1}$ gross energy (Ingweye*et. al*, 2010

Dasuki*et. al*, 2014). Augustine *et al.,* (2014) also reported that seed meal of *Sennaobtusifolia* were found to contain protein (21.89%), energy (3171.61kcal/kg), crude fiber (12.45%), ether extract (9.50%), Nitrogen free extract (44.55%), dry matter (96.80%) and ash (4.16%).However, the seeds may be harmful to livestock especially monogastric animals when consumed in an unprocessed form. The study was carried out to determine the of effect of raw and differently processed *Sennaobtusifolia* seed meals on the growth performance, carcass characteristics and blood profile of weaner rabbits

II. Materials And Methods

The study was conducted at the Rabbit Unit of the Department of Animal Science and Range Management, ModibboAdama University of Technology, Yola.Yola is located at latitude 7^{O} 11' North and longitude 11^{O} 14' East and at an elevation of 364m above sea level in the North Eastern part of Nigeria. Yola is situated within the Sudan Savannah vegetation zone .The maximum temperature can reach 38^{O}C particularly in April, while minimum temperature can be as low as 18^{O}C .The mean relative humidity ranges from 30-50% with a minimum in February to March when it drops to as low as 10% and a maximum of 90% in August (Adebayo and Tukur, 1999).

Source and processing of experimental material

The raw seeds of *Sennaobtusifolia*were procured locally in Njoboliyo area of Yola South Local Government in Adamawa State. The processing methods (toasted and sprouting) were adopted from Augustine *et al.* (2013), while boiling and fermentation methods were adopted by methods described by Katakiet*al. (*2010) and Udensi*et al.*(2006). All raw and differently processed *Sennaobtusifolia*seeds were milled sieved with 2mm using hammer miller.

Experimental diets and design

Forty (40) weaned rabbits with an initial average weight of 409.25± 0.75g were allotted to five dietary treatments. Each dietary treatment group had four replicate with two rabbits per replicate in a Completely Randomized Design (CRD).Five experimental diets were compounded using raw and differently processed *Sennaobtusifolia*seed meals. The diets containing 10% raw *Sennaobtusifolia*(ROSM)designated as the control diet (T1) while diets T2, T3 and T4 contained 10% Toasted*Sennaobtusifolia* seed meal (TSOSM), Sprouted*Sennaobtusifolia* seed meal (SSOSM), Boiled *Sennaobtusifolia*seed meal(BSOSM), and Fermented*Sennaobtusifolia*seed meal(FSOSM), respectively as shown in Table 1

Data collection

Data were collected on growth performance, apparent nutrient digestibility and blood profile and carcass characteristics.

Growth performance

Feed intake was recorded daily for a period of 56days. Body weight gain was obtained by subtracting initial body weight gain from final weight of the rabbits and the FCR was calculated by dividing feed intake by body weight gain.

Table 1: Ingredient percentage composition of experimental diets

Ingredients	processing methods				
	RSOSM	TSOSM	SSOSM	BSOSM	FSOSM
Maize	50.00	50.00	50.00	50.00	50.00
Maize offal	10.00	10.00	10.00	10.00	10.00
Soymeal	10.00	10.00	10.00	10.00	10.00
Sennaobtisfolia	10.00	10.00	10.00	10.00	10.00
Groundnut cake	7.50	7.50	7.50	7.50	7.50
Brewers dry grain	7.50	7.50	7.50	7.50	7.50
Fish meal	2.00	2.00	2.00	2.00	2.00
Bone meal	2.00	2.00	2.00	2.00	2.00
Methionine	0.25	0.25	0.25	0.25	0.25
Lysine	0.25	0.25	0.25	0.25	0.25
Salt	0.25	0.25	0.25	0.25	0.25
Premix*	0.25	0.25	0.25	0.25	0.25

Total	100	100	100	100	100
Calculated analysis %					
Crude protein	18.74	18.74	18.74	18.74	18.74
Crude fibre	6.27	6.27	6.27	6.27	6.27
Ether extract	3.45	3.45	3.45	3.45	3.45
Ca	1.27	1.27	1.27	1.27	1.27
P	0.75	0.75	0.75	0.75	0.75
Methionine	0.72	0.72	0.72	0.72	0.72
Lysine	1.22	1.22	1.22	1.22	1.22
ME(Kcal/kg)	2845.00	2845.00	2845.00	2845.00	2845.00

*0.25kg Vitamin–Mineral Premix (Animal Care) supplies the following: Vitamin 12,000,000 vit. D_3 3000,000, vit. E 30,000 mg, vit. K_3 2,500 mg, folic acid 1,000 mg, niacin 40,000, calpan, 10,000 mg vit. B_2 5000 mg, vit.B_{12} 20 mg, vit.B_1 2,000 mg, vit. B_6 3,500 mg, biotin 80 mg and antioxidant 125,000 mg, cobalt 250 mg, selenium 250 mg, iodine 1,200 mg, iron 40,000 mg, manganese 70,000mg, copper 8,000 mg, zinc 60,000 mg, chloride 200,000 mg.

Apparent nutrient digestibility study

Four rabbits per treatment (one per replicate) were randomly selected, transferred into metabolic cages. Faecal samples were collected for a period of five days .Faeces were collected using aluminum sheets inserted in the cages and sundried. Representative samples of each treatment were analyzed for proximate composition. Digestibility values for dry matter (DM), crude protein (CP), ether extract (EE) and crude fibre (CF) was calculated using the formula:

Apparent nutrient digestibility=$\frac{Nutrient\ \ intake\ \ -Nutrient\ \ in\ feace}{Nutrient\ \ intake} \times 100$

Carcass and internal organs measurement

At the end of week eight, four (4) rabbits were randomly selected from each treatment and fasted for 12hrsbut water was provided *ad-libitum*. Thereafter the rabbits were weighed, slaughtered, flayed (skinned) and eviscerated to obtain the carcass weight as described by Wafar*et al.* (2017). The pelt (skin) and all the internal organs were weighed separately. The dressing percentages were calculated as described by Olumo (2011)

Dressing percentage = Carcass weight x 100
Live weight

Blood profile analysis

On the last day of the experiment (8 weeks), blood samples were collected from four rabbits per treatment for determination of hematological parameters and biochemical profile as described by Uko*et al*. (2006).

Chemical analysis

Proximate and anti-nutritional compositions of raw and differently processed *Sennaobtusifolia*seed meals were carried as described by AOAC, (2006).

Statistical analysis Statistical Analysis

All data collected were subjected to one- way analysis of variance (ANOVA) in a completely randomized design (CRD) as described by Gomez *et al*.(1984) using JMP SAS, version 13 (2013). Means were separated using same software option of mean separation.

III. Results And Discussion

Proximate Composition of Raw and Differently Processed *SennaObtusifolia* Seed Meals.

Table 2 shows the result of proximate composition of raw and differently processed *Sennaobtusifolia*seed meal. The result indicated that raw seed meal contained 93.25% dry matter, 14.05% crude fibre, 23.04% crude protein, 9.03% ether extract, 7.82% ash 37.29% nitrogen free extracts and 2871Kcal/kg metabolizable energy. The result also revealed that toasted and sprouted *Sennaobtusifolia*seed meals have a range of 90.34-90.45% dry matter, 21.03-23.14% crude protein, 6.03-6.72% ash, 7.98-8.25% crude fibre, 6.20-7.25% ether extracts, 44.98-48.31% nitrogen free extract and 2605-2765Kcal/kg metabolism energy. Boiled and fermented *Sennaobtusifolia*seed meals also contained 92.20 and 90.30% dry matter,22.94-25.13% crude protein ,6.25 and 8.25% ash, 6.25 and 6.90% crude fibre ,6.18 and 7.01 % ether extracts, 50.20 and 43.01 % nitrogen free extracts and 2890 and 2803Kcal/kg metabolizableenergy.The study showed improvement in crude protein content of processed seed meals. This result confirmed a study conducted by Emiola*et al.,* (2014) when the

authors subjected tropical seed to boiling, toasting and fermentation. The values of Crude protein of raw, fermented, boiled and Sprouted seed meals are comparable with the values reported earlier by Augustine *et al*.,(2017) who reported 25.90% for fermented, 23.07 for sprouted, 23.40 for raw ,22.80 boiled and 20.18 soaked.

Table2: Proximate composition of raw and differently processed *Sennaobtusifolia* seed meal

	RSOSM	TSOSM	SSOSM	BSOSM	FSOSM
Dry matter	91.23	90.34	90.45	92.20	90.30
Crude protein	23.04	23.14	21.03	22.94	25.13
Ash	7.82	6.72	6.03	6.25	8.25
Crude fibre	14.05	8.25	7.98	6.25	6.90
Ether extract	9.03	7.25	6.20	6.48	7.01
ME (kcl/kg)	2588	2605	2765	2890	2803
Nitrogen free extract	37.29	44.98	48.31	50.28	43.01

RSOSM-Raw *sennaobtusifolia* seed meal
TSOSM-Toasted *sennaobtusifolia* seed meal
SSOSM-Sprouted *sennaobtusifolia* seed meal
BSOSM-Boiled *sennaobtusifolia* seed meal,
FSOSM-Fermented *sennaobtusifolia* seed meal.

Anti-nutrients composition of raw and differently processed *Sennaobtusifolia* seed meal

Table 3 present the result of anti -nutritional factors. The results indicates that Tannin had the values of 196.56 for Raw, 171.20 Toasted, 110.34 Sprouted, 100.21 Boiled and 87.45 in Fermented which is the least. Terpenoid had 35.56 for RSOSM, 13.12 for TSOSM, 25.43 for SSOSM, 10.56 in BSOSM and 9.67 in FSOSM which is the leastSaponin had the highest amount in raw RSOSM 65.45, toasted TSOSM 24.13, sprouted SSOSM 45.46, boiled BSOSM 25.67, and fermented FSOSM with the least amount of 19.56.Phytate 173.67 for Raw, 120.19 Toasted, 134.79Sprouted, 112.78 Boiled, and 23.67 Fermented. Raw *Sennaobtusifolia* seed meal (RSOSM) reported a value of 56.45 saponin far more than the value of 19.56 recorded for fermented (FSOSM) ,this decrease in anti-nutritional factors among processing methods was observed in almost all the phytochemicals analyzed for, example tannin, terpenoid, caffeine, haemaglutimine,saponin, phytate, phenol observed were in line with the reports of Akinmutimi,(2007) and Ukpabi (2007) who reported similar trend in velvet beans and *mucunasloanei* seed when subjected to different processing method.

Table 3: Anti-nutrients composition of raw and differently processed *Sennaobtusifolia* seed meal (mg/100g)

Minerals	RSOSM	TSOSM	SSOSM	BSOSM	FSOSM
Tannins	196.56	171.20	110.34	100.21	87.45
Terpenoid	35.56	13.12	25.43	10.56	9.67
Caffeine	0.90	0.03	0.40	0.01	ND
Haemaglutimin	1013.78	977.67	987.9	178.56	162.67
Saponins	65.45	24.13	45.46	25.67	19.56
Phytate	173.67	120.19	134.79	112.78	23.67
Phenol	168.56	152.45	124.78	84.11	41.69
Oxalate	67.23	24.24	47.89	35.21	10.45
Glycosides	574.68	412.65	479.67	210.43	78.13
Flavonoid	976.87	752.16	843.89	234.65	112.45
Alkaloid	251.56	146.78	163.56	75.34	62.11

RSOSM-Raw *sennaobtusifolia* seed meal
TSOSM-Toasted *sennaobtusifolia* seed meal
SSOSM-Sprouted *sennaobtusifolia* seed meal
BSOSM-Boiled *sennaobtusifolia* seed meal,
FSOSM-Fermented *sennaobtusifolia* seed meal

Growth performance of weaner rabbits feed raw and differently processed *Sennaobtusifolia*seed meal.

Table 4 shows Growth performance of weaner rabbits feed raw and differently processed *Sennaobtusifolia*seed meal.Rabbits fed fermented *Sennaobtusifolia*seed meal diets(T5) 2516.60kg and Boiled(T4) 2478.30kg *Sennaobtusifolia*recorded significantly higher ($p< 0.05$)total feed intake, while those fed raw (T1) 2443.30kg and toasted (T2)2429.41kg had similar total feed intake. Also there was significant difference for Average daily weight gain (ADWG) among the treatments. Studies have shown that inclusion of unconventional feedstuffs may alter the texture, colour, taste and odour of diets ,therefore, feed consumption will ultimately be affected by one of this factors or a combination (Odunsi*et al*,1996) which was the case in this

experiment in which there was low feed intake , low body weight gain and low final body weights for raw (RSOSM) as compared to the fermented (FSOSM) which performed the best in average daily feed intake, total feed intake, average daily weight gain and final body weight .Feed conversion ratio was also best in FSOSM fed rabbits with FCR of 3.47 as against the RSOSM fed rabbits with 4.45, this result on FCR for FSOSM agreed with a feeding trial on fermented cotton seed meal by Kanyinji and Sachangwa (2014)

Table 4Growth performance of weaner rabbits feed raw and differently processed *Sennaobtusifolia*seed meal.

Parameter	Processing method					
	T1 (RSOSM)	T2 (TSOSM)	T3(SSOSM)	T4 (BSOSM)	T5 (FSOSM)	SEM
Initial body weight (g)	407.50	405.00	407.50	406.25	402.50	5.94^{ns}
Final body weight (g)	968.75^{b}	1087.50^{a}	1050.00^{a}	1112.50^{a}	1137.50^{a}	55.50^{**}
Body weight gain (g)	561.25^{c}	682.50^{b}	642.50^{b}	706.25^{a}	735.00^{a}	54.34^{*}
ADWG (g)	10.02^{c}	12.18^{b}	11.47^{bc}	12.61^{b}	13.12^{a}	0.19^{**}
Total feed intake (g)	2443.30^{b}	2439.41^{b}	2393.48^{c}	2478.30^{ab}	2516.86^{a}	19.43^{**}
ADFI (g)	43.63^{b}	43.56^{b}	42.74^{c}	44.25^{ab}	44.94^{a}	0.24^{**}
Feed conversion ratio	4.45^{a}	3.77^{b}	3.54^{b}	3.53^{b}	3.47^{b}	0.35^{*}

Means on same row bearing different superscript differ significantly (P<0.05)
RSOSM-Raw *sennaobtusifolia* seed meal
TSOSM-Toasted *sennaobtusifolia* seed meal
SSOSM-Sprouted *sennaobtusifolia* seed meal
BSOSM-Boiled *sennaobtusifolia* seed meal,
FSOSM-Fermented *sennaobtusifolia* seed meal

Carcass characteristics and internal organ weights of weaner rabbits fed raw and differently processed *Sennaobtusifolia* seed meal.

Carcass characteristics and internal organ weights of weaner rabbits fed raw and differently processed *Sennaobtusifolia* seed meal is shown in Table 5. Dress weight ranged from 619 in FSOSM to 395.25 in TSOSM. Dressing percentage ranged from 56.88 for BSOSM to 38.33 in TSOSM showing significant ($p < 0.01$) difference affected by processing methods. Rabbits fed fermented (FSOSM) recorded higher organ weights for small intestine length, liver, kidney, caecum length, lungs and heart, while rabbits fed Raw (RSOSM) also recorded higher weights in kidney, heart, lung and small intestine length. Dressing weight and dressing percentage were significant significant ($p<0.05$), dressing percentage obtained in the study were in agreement with Ajaiya (2012) who reported a range of 56.26-58.35% but slightly higher than 48.57-54.83 reported by Aamefule*et al.*(2004) for tropical rabbits ,the variation could be due to age at slaughter , type of feed offered during the study, The higher lengths of stomach and caecum lengths in rabbits fed FSOSM could be attributed to increase metabolic rate as a result of increase in microbial flora in the caecum and stomach and also increase absorption rate in the small intestine.

Table5 Carcass characteristics and internal organ weight of weaner rabbits fed raw and differently processed *sennaobtusfolia* seed meal

Parameters	Processing methods of *Sennaobtusifolia*seed meal					
	T1	T2	T3	T4	T5	SEM
Live weight (g)	918.75	1037.50	1000.00	1062.50	1087.50	55.50^{*}
Slaughter wt. (g)	868.75	966.25	915.00	1015.00	1023.75	57.42^{*}
Dressed weight (g)	439.00^{ab}	395.25^{b}	536.00^{ab}	615.00^{a}	619.00^{a}	58.94^{*}
Dressing %	47.42^{ab}	38.33^{b}	53.65^{a}	56.58^{a}	57.88^{a}	4.70^{*}
Pelt weight (g)	79.00^{b}	37.25^{c}	101.50^{ab}	109.50^{a}	111.75^{a}	8.72^{*}
Body length (cm)	25.75^{b}	26.25^{ab}	29.50^{ab}	30.25^{a}	29.75^{ab}	1.34^{*}
Head weight (g)	107.00^{a}	77.00^{b}	110.75^{ab}	96.25^{ab}	119.00^{a}	8.48^{*}
Internal organs (% live weights)						
sHeart	0.80^{a}	0.24^{c}	0.50^{b}	0.54^{b}	0.45^{b}	0.06^{*}
Liver	0.45^{c}	0.54^{b}	0.33^{c}	0.31^{c}	0.65^{a}	0.01^{*}
Lung	1.09^{a}	0.27c	0.57^{bc}	0.75^{ab}	1.11a	0.11^{*}
Kidney	0.80^{a}	0.24c	0.50^{b}	0.54^{b}	0.80^{a}	0.06^{*}
Stomach length (cm)	8.50^{bc}	6.75c	9.25^{ab}	11.25^{a}	11.00^{a}	0.74^{*}
Caecum length (cm)	9.00^{ab}	7.50^{b}	7.75^{c}	11.50^{a}	10.25^{ab}	0.96^{*}
L. I intestine (cm)	37.75	42.50	35.00	36.50	40.75	3.60^{*}
S.I Length (cm)	235.00^{ab}	215.00^{b}	250.00^{ab}	254.25^{ab}	279.00^{a}	16.18^{*}

Means in the same row bearing different superscripts differ significantly ($P<0.05$)*
SEM = Standard error mean

L.I = large intestine
S.I = small intestine

Haematological and biochemical values of weaner rabbits fed raw and differently processed *Sennaobtusifolia* seed meal.

Table 6 revealed Haematological and biochemical values of weaner rabbits fed raw and differently processed *Sennaobtusifolia* seed meal.Haemoglobin showed significant ($p < 0.01$) difference among different treatments, the values were RSOSM 8.65, TSOSM 10.67, SSOSM 10.29, BSOSM 9.32 and FSOSM 8.18. Pack cell volume (PVC) also showed significance ($p < 0.01$) for all treatments. Parameters like MCV, MCHC, MCH all showed significance ($p < 0.01$) among the different treatments. The high quantity of haemoglutimin 1013.78mg/100g in RSOSM as against 178.5mg /100g in FSOSM may have been responsible for the reduced PCV for RSOSM fed rabbits. The haemoglobin (Hb) values fall within the normal range of 4-17.4g/dl for rabbits reported by (Jenkins,1993 and Hiller,1994).The lower Hb reported in RSOSM 8.65g/dl as against 10.10g/dl in fermented FSOSM implies that dietary proteins were not of high quality .Abu *et al*.,(1998) attributed low Hb in rabbits to effects of anti-nutrients in the diet. Red blood cells (RBC) values were not significant ($p>0.05$) for all the processing methods except for the monocytes

Table 6: Haematological and Biochemical indices of weaner rabbits fed raw and differently processed *Sennaobtusifolia* seed meal.

Means in the same row bearing different superscripts differ significantly ($P<0.01$) **,

Processing methods Parameters	T1	T2	T3	T4	T5	SEM
PCV (%)	28.00^{a}	38.50^{b}	36.00^{b}	35.00^{b}	35.50^{b}	2.21^{*}
Haemoglobin (g/dl)	8.65^{ab}	10.67^{a}	10.27^{ab}	9.32^{ab}	10.10^{a}	0.55^{*}
RBC ($\times10^{6}$/µl)	5.70	6.78	6.49	6.95	7.09	0.63^{ns}
MCV(μm^{3})	95.39^{a}	59.85^{ab}	59.86^{ab}	62.65^{ab}	54.24^{b}	10.73^{*}
MCH (Pq)	18.12^{a}	16.16^{ab}	16.00^{ab}	13.52^{ab}	11.54^{b}	1.72^{*}
MCHC (%)	19.60^{b}	27.02^{a}	26.66^{a}	21.81^{ab}	21.28^{ab}	1.70^{*}
WBC ($\times10^{3}$/µl)	11.31^{a}	7.37^{b}	7.95^{b}	7.67^{b}	8.17^{b}	0.49^{**}
Monocytes (%)	3.20^{a}	1.70^{b}	2.15^{b}	1.90^{b}	1.61^{b}	0.24^{**}
Lymphocyte %	36.00^{a}	27.50^{b}	25.50^{b}	27.50^{b}	27.50^{b}	1.09^{**}
Eosinophil %	2.40	1.72	1.06	1.90	1.79	0.39^{ns}
Neutrophils (%)	44.00^{a}	36.50^{b}	36.50^{b}	36.50^{b}	35.50^{b}	0.89^{*}
Biochemical indices						
Cholesterol(mg/dl)	49.88^{a}	37.46^{b}	37.11^{b}	38.89^{b}	37.33^{b}	1.89^{*}
Total protein (g/dl)	5.45^{b}	7.41^{a}	7.27^{a}	6.95^{a}	7.30^{a}	0.22^{*}
Albumin (g/dl)	2.85^{b}	4.28^{a}	3.93^{a}	3.80^{a}	3.79^{a}	0.16^{**}
Globulin (g/dl)	2.60^{b}	3.15^{a}	3.33^{a}	3.15^{a}	3.50^{a}	0.11^{*}
Glucose (mg/dl)	75.94^{b}	96.06^{a}	101.71^{a}	99.00^{a}	99.00^{a}	5.13^{*}
Urea (mmol/l)	24.00^{a}	14.50^{b}	15.50^{b}	16.50^{b}	14.50^{b}	0.89^{*}
Creatinine (Mmol/l)	34.27	39.28	41.11	32.88	36.28	3.75^{ns}

Nutrient digestibility of weaner rabbits fed raw and differently processed *Senna Obtusifolia* seed meal.

Table 7 shows the Nutrient digestibility of weaner rabbits fed raw and differently processed *SennaObtusifolia* seed meal. The different processing methods had significant ($p< 0.01$) effect on all the nutrients analysed for.Dry matter (DM) was significantly higher in rabbits fed toasted (TSOSM) 67.944, Fermented (FSOSM) 65.70 and raw (RSOSM) 55.58,while sprouted (SSOSM) had 61.08 and boiled (BSOSM) 63.44.Crude protein(CP) digestibility was significant ($p< 0.01$) across all the treatments with fermented recording 71.38 followed by toasted 72.45,boiled 70.38 and sprouted 58.38 recorded the least figure The values for dry matter, crude protein, crude fibre, ether extract and nitrogen free extract was high for fermented, toasted, boiled, sprouted , but lower for raw ,which could be due to accumulation of anti-nutritional factors in the diet .This agreed with the report of Shaabu*et al* .(2017). As a result digestibility and availability of some amino acids were reduced and this exhibited poor protein quality .It was observed that the wet heat processing methods improved the protein quality to a greater extent than the dry heat methods (Goervan and Theophilus, 2017).

Table 7 Nutrient digestibility of weaner rabbits fed raw and differently processed *SennaObtusifolia* seed meal

Parameters	T1	T2	T3	T4	T5	SEM
Dry matter	55.58^{b}	67.74^{a}	61.08^{ab}	63.44^{ab}	65.70^{ab}	2.81^{**}
Crude protein	59.08^{c}	72.45^{a}	68.35^{ab}	70.38^{a}	61.17^{b}	2.85^{**}
Crude fibre	42.11^{d}	67.26^{bc}	69.97^{ab}	63.69^{ab}	73.39^{a}	1.71^{***}

Ether extracts	51.18[b]	67.18[ab]	65.73[b]	71.33[a]	63.66[b]	1.40***
Ash	50.88[b]	69.72[a]	66.52[a]	65.17[a]	65.17[a]	1.50***
Nitrogen free extracts	42.64[b]	67.36[a]	66.47[a]	65.64[a]	65.25[a]	1.19***

IV. Conclusion

Results from this study showed that fermented*Sennaobtusifolia*seed meal gave the better method of reducing anti-nutritive factors, enhanced nutrient availability, and good carcass yield with a reduction in feed cost.

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