International Journal of Science and Technology Research Archive

ISSN: 0799-6632 (Online)

Journal homepage: https://sciresjournals.com/ijstra/

(RESEARCH ARTICLE)

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Effect of cashew meal (*Anacardium occidental*) on organ yields and organoleptic characteristics of broiler meat in Côte d'Ivoire

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International Journal of Science and Technology Research Archive, 2023, 04(01), 244–254

Publication history: Received on 24 January 2023; revised on 04 March 2023; accepted on 07 March 2023

Article DOI: https://doi.org/10.53771/ijstra.2023.4.1.0045

Abstract

The aim of this study is to valorise cashew oilcake in broiler feed. Cashew oilcake is used in the formulation of five (5) feed rations: F0 (with 0% cashew meal and 100% soybean meal); F100 (with 100% cashew meal and 0% soybean meal); F75 (with 75% cashew meal and 25% soybean meal); F50 (with 50% cashew meal and 50% soybean meal); F25 (with 25% cashew meal and 75% soybean meal) for broiler chickens Five (5) batches of 60 chicks (Cobb 500) of 5 days of age and not sexed were fed the 5 diets (F0, F100, F75, F50 and F25) for 6 weeks. Five (5) chickens per batch were slaughtered to determine carcass characteristics, organ weights and organoleptic evaluation. The incorporation of cashew oilcake in the poultry diet significantly ($P<0.05$) modified the carcass yield of the broilers. Lot F25 showed the best yield with 86.66%, followed by the control lot F0 (84.01%), then lot F50 (78.65%), lot F75 (77.03%) and finally lot F100 (73.43%). In contrast, organ yields (liver, gizzard, heart, lung and intestine) and abdominal fat of the experimental chickens did not differ significantly from the controls. The formulated experimental rations had no depressive effects on organ development with a very low mortality rate (1.67-3.33%).

Organoleptically, the colour of the meat of batches F50 and F25 was judged to be white in agreement with the control batch F0, in contrast to batches F75 and F100, which were judged by the panelists to be neither red nor white and red respectively. Secondly, the meat of the chickens fed with the F100, F75 and F25 rations was judged more succulent respectively with a score of 4/5; 3.9/5 and 3.74/5 by the panel compared to the F0 control (3.19/5). In addition, the panel judged the meat from batches F100 and F75 to be less tender with scores of 2.77/5 and 3.35/5 respectively, and those from batches F50 (3.97/5) and F25 (4.48/5) to be more tender compared to the control batch F0 (3.81/5). Overall, the meat from the five (5) lots was judged good by all consumers. However, the meat from the batches of poultry that consumed cashew cake-based rations was much more appreciated by the panelists, especially batch F25. In sum, cashew oil cakes can be used in broiler feed.

Keywords: Broiler; Cashew; Organoleptic; Cashew cake; Cashew nuts

1 Introduction

Broiler productivity has improved dramatically, thanks to concomitant advances in husbandry, nutrition, genetics and veterinary medicine. These advances have resulted in a significant reduction in age at slaughter [1]. Poultry is an important part of the human diet. It is a relatively cheap and good quality dietary product, rich in protein and low in fat [2]. Global demand for poultry meat continues to grow strongly, resulting in a very dynamic global market. And because of the population growth in West Africa, animal production remains insufficient to meet the population's need for animal protein [3]. Poultry farming currently occupies a prominent place in development and poverty reduction strategies in most developing countries [4]. Côte d'Ivoire is an agricultural country with a fairly diverse climate. In less

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than 20 years, Côte d'Ivoire has moved from entirely traditional production to increasingly modern production [5]. The primary meat production in Côte d'Ivoire is poultry meat, mainly chicken meat. Poultry meat is important in human nutrition as it provides an interesting protein intake for a low fat content. However, depending on the species or muscle considered, these proportions differ, as do other constituents such as vitamins, fatty acids or mineral elements, which may also vary according to the authors and the analysis methods used. Thus, each meat has its own nutritional characteristics, which are sometimes more or less similar between species [6]. The demands and evolution of the poultry production market require greater control of the quality and characteristics of the products: relative share of the different parts of the carcass, proportion of fat, quality of the meat, etc. These can be affected by different factors of variation that can be either intrinsic to the animal (species, type of muscle, sex, genetic selection and age at slaughter) or extrinsic (feed, rearing, transport, slaughter and technological treatment conditions) [7]. Thus, one of the major concerns of the poultry industry is to provide meat of consistent and high quality in terms of colour, texture, flavour and juiciness. The two most important parameters are appearance and texture (which determine consumer acceptability or rejection). However, juiciness and flavour remain extremely important in determining quality [7]. It is within this framework that the present study proposes to determine the organoleptic profile of broilers fed with cashew cakes. Specifically, it will aim to:

- Determine the impact of cashew oilcake on the organoleptic performance of broilers;
- Evaluate the impact of cashew oilcake on the organoleptic profile of broiler meat.

2 Material and methods

2.1 Presentation of the study area

The study area belongs to the city of Abidjan, the economic capital of Côte d'Ivoire, located in the south of the country. The city of Abidjan lies between latitudes 4°10 and 5°30 North and longitudes 3°50 and 4°10 West [8]. The study area is subject to a humid equatorial climate with coastal facies [9]. It is characterised by a transitional climate (Attean climate) which is subdivided into four essential seasons in the annual cycle [10].

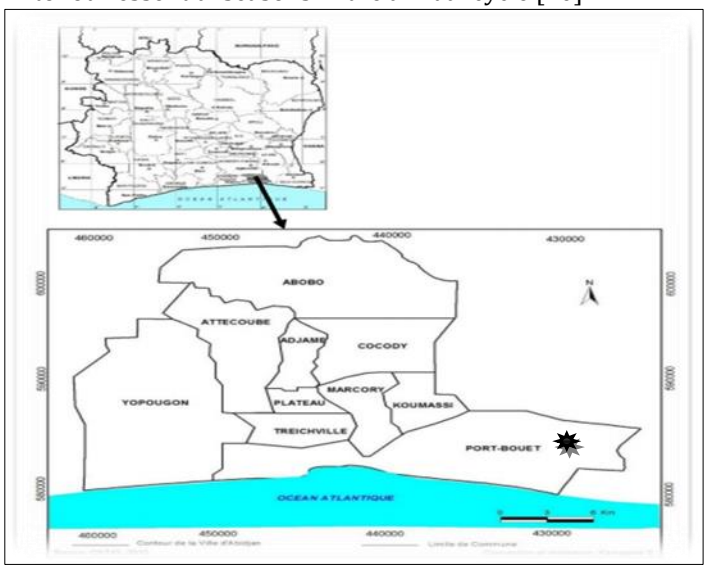

Figure 1 Location of the study area, city of Abidjan

2.2 Biological materials

2.2.1 Plant material

The plant material consisted of declassified cashew kernels collected in an industrial cashew nut processing unit "Eburnie" based in Abidjan zone 3 in Côte d'Ivoire. And soybean cake purchased commercially from a company called "KENZ" based in Abidjan.

2.2.2 Animal material

The animal material consisted of three hundred (300) unsexed one-day-old broiler chicks of the cobb500 strain. Divided into five (5) batches of 60 chicks each and fed with different formulated rations**.**

A) Cashew nuts B) Soya cake

Figure 2 Cashew and soya cake

2.3 Methods

2.3.1 Formulation of chicken starter rations

The feed rations consisted of maize meal, fish meal, bi-calcium phosphate, vitamin complex (TNH), salt, shellfish, Fysal-MP and Toxo-XL. In addition to these ingredients, the rations are composed of 30% soybean meal and 0% cashew meal for F0; 0% soybean meal and 30% cashew meal for F100; 7.5% soybean meal and 22.5% cashew meal for F75; 15% soybean meal and 15% cashew meal for F50 and 22.5% soybean meal and 7.5% cashew meal for F25 as presented in the following table**:**

2.3.2 Formulation of chicken growth rations

The feed rations are made up of maize meal, fish meal, bi-calcium phosphate, vitamin complex (TNH), salt, shellfish, Fysal-MP and Toxo-XL. In addition to these ingredients, the rations are composed of 28% soybean meal and 0% cashew meal for F0; 0% soybean meal and 28% cashew meal for F100; 7% soybean meal and 21% cashew meal for F75; 14% soybean meal and 14% cashew meal for F50; and 21% soybean meal and 7% cashew meal for F25, as presented in the following table.

2.3.3 Formulation of chicken finishing rations

The feed rations consist of maize meal, fish meal, vitamin complex (TNH), salt, shellfish, Fysal-MP and Toxo-XL. In addition to these ingredients, the rations are composed of 26% soybean meal and 0% cashew meal for F0; 0% soybean meal and 26% cashew meal for F100; 6.5% soybean meal and 19.5% cashew meal for F75; 13% soybean meal and 13% cashew meal for F50 and 19.5% soybean meal and 6.5% cashew meal for F25 as presented in the following table:

2.3.4 Determination of the physico-chemical constituents of the oilcake

The dry matter content of the oilcake (cashew and soybean) and of the rations formulated with oilcake (cashew and soybean) was determined according to the method [11]. Then, the dry matter content was calculated according to the following formula: DM = 100 - TH with DM: dry matter content; T H: moisture content. The ash content of oilcake (cashew and soybean) and oilcake-based rations (cashew and soybean) was determined according to method [11]. The method described by Dufour et al [12] allows the determination of the pH of the oil cakes (cashew and soybean) and of the rations formulated with these oil cakes (cashew and soybean). Indeed, 20 g of the powder are diluted in 200 ml of distilled water. This solution was stirred at room temperature (28 °C) for 30 min and then centrifuged at 600 rpm for 15 min. The pH of the supernatant was measured using a pH meter. The lipids contained in the oilcake (cashew and

soybean) and the rations formulated with oilcake (cashew and soybean) were determined according to the method [13]. The protein content of the oilcake (cashew and soybean) and the different rations formulated with oilcake (cashew and soybean) is determined according to the Kjedahl method [13]. The crude cellulose content was determined by the Weende method, which consists of two successive hydrolyses [14]. Crude fibre or insoluble fibre consists of cellulose, some hemicelluloses and lignin. The crude fibre content of oil cakes (cashew and soybean) and of different rations formulated with oil cakes (cashew and soybean) is determined according to the method [11].

2.3.5 Calculation of carbohydrate content

The carbohydrate content in relation to the dry matter is determined by the method [15]. The calculation is done with the determined values of protein, fat, ash and fibre. The formula used is as follows:

$$\text{Carbohydrate (\% DM)} = 100 - [\text{prot (\% DM)} + \text{lip (\% DM)} + \text{fibre (\% DM)} + \text{ash (\% DM)}]$$

prot: protein ;lip: lipid

2.3.6 Calculation of the energy value

The most commonly used way of expressing the energy value in monogastric feeds is the metabolisable energy. It is expressed in kcal / kg feed. For poultry in particular, the evaluation of energy value is done by the EMAN. Many prediction equations have been established by different authors [16] and [17] based on the analytical parameters of the product. In this work, we used the formula of Sibbald [16] for mixtures and those of Janssen [17] for raw materials, These formulas are as follows:

2.3.7 Mixture

$$\text{EM (kcal / g DM)} = 3.951 + 0.0544\ \text{MG} - 0.0887\ \text{CB} - 0.0408\ \text{MM}$$

2.3.8 Raw materials

cashew meal / soybean

$$\text{ME (kcal / kg DM)} = (1242 + 25.50\ \text{MG} - 25.47\ \text{BC}) / 0.418$$

2.3.9 Conduct of the experiment

Table 1 Prophylaxis plan

Age (day)	**Operations**	**Products**
1	Vaccination against Newcastle disease	IMOPEST (hatchery) HB1 (beak dipping)
2	Prevention of post-vaccination reactions and stress	Anti-stress (drinking water), sugar water
5-8	Treatment for coccidiosis and vitamin therapy	Vetacoxes and Amin 'total (drinking water)
14	Gumboro disease vaccine reminder	HipraGumboro (drinking water)
16	vaccination against pseudo-avian plague or Newcastle disease	sota (drinking water)
16-18	Treatment of susceptible diseases	Tyldox (drinking water)
20-23	Prevention of stress in chickens	Coli-terravet (drinking water)
24	Reminder vaccination against pseudo avian plague or Newcastle disease	sota (drinking water)
29-30	Coccidiosis vaccine	Superhipracox (drinking water)

It is based on the principle of "single-band" rearing, consisting of the management of sub-lots of animals of the same age, species and production type. The three hundred (300) chicks are then fed with commercial feed (IVOGRAIN) for 4 days at a density of 10 birds/m^2. At start-up, the chicks are weighed individually to determine their average weight and make the batches homogeneous. The chicks were then randomly divided into five (5) batches according to the experimental rations formulated. From day 5 onwards, each group of chicks will be fed with the experimental rations (F0, F1, F2, F3 and F4) until the 7th week. The quantities of feed served and the refusals are weighed to deduce the consumption. Weighing will then be done weekly and individually using a precision mechanical scale from week 2 onwards.

2.3.10 Sensory analysis of meat

2.3.10.1 Composition of the evaluation panel

The tasting panel was made up of randomly selected individuals, both male and female, ranging in age from 12 to 40+ years.

2.3.10.2 Preparation of the samples

Four (4) randomly selected chickens per batch were slaughtered and the legs, wings and breasts were cut up. These pieces were pooled by batch and marinated for a few minutes without the addition of any ingredients.

2.3.10.3 Description of the sensory evaluation

The sensory evaluation was carried out according to the hedonic method, which concerns the study of preferences and aversions of consumers, users or customers [18]. The aim of our sensory test was to compare the meat of poultry fed with our different rations formulated with oil cakes (cashew and soya). It took place in a room set up for sensory testing. The taste, colour, texture and smell were followed by an overall assessment of the different pieces of thighs, wings and breasts. The panel used cards to be filled in by marking the number corresponding to the sample tested on a scale from 1 to 5 according to the five assessment criteria, taste (very bland, bland, neither juicy nor bland, juicy, very juicy), smell (very unpleasant, unpleasant, neither unpleasant nor pleasant, pleasant, very pleasant), texture (very firm, firm, neither tender nor firm, tender, very tender), colour (very red, red, neither white nor red, white, very white) and overall assessment (very bad, bad, neither good nor bad, good, very good). Thus, the people who received the samples of cooked meat were able to mark the number corresponding to their appreciation of the taste, colour, texture and smell of the different pieces according to an evaluation form (Table2).

Table 2 Tasting sheet

Age :	**12 – 18**	**19 – 30**	**31 - 40**	**40 et +**	**SEX**	**CODE:**
Check						
Description	Colour intensity					
	(1) Very red	(2) red	(3) Neither red - nor white	(4) white	(5) Very white	
Check						
Description	The texture					
	(1) Very firm	(2) firm	(3) Not soft - not firm	(4)Tendre	(5) Very tender	
Check						
Description	Taste					
	(1) Very bland	(2) bland	(3) Not juicy - not bland	(4)J Juicy	(5) Very Juicy	
Check						
Description	The smell					
	(1) Very unpleasant	(2) Disagreeable	(3) Neither pleasant - nor unpleasant	(4) Pleasant	(5) Very pleasant	
Check						

Description	Overall assessment				
	(1) Very bad	(2) Bad	(3) No good - no bad	(4) Good	(5) Very good
Check					

2.3.11 Data processing and statistical analysis

The different data obtained were recorded and processed in the Microsoft Excel spreadsheet. The comparison of the means between the different food treatments was carried out by the Turkey test used for the analysis of variance (ANOVA) using GraphPad Prism 8.4.3 (686) software. Comparisons were considered significant when p-values were less than 0.05.

3 Results

3.1 Physico-chemical composition of cashew and soybean meals

The analysis of the physicochemical composition of cashew and soybean meals does not show a great variability between the two sources (Table 3). Apart from metabolizable energy (ME), the statistical analysis for the Turkey test reveals no significant difference ($p < 0.05$) between the different parameters evaluated.

Table 3 Comparison of the chemical composition of cashew and soybean meals (%MS)

Variables	**Cashew nuts (n=3)**	**Soybean meal (n=3)**
Protein (%)	34.62±0.72	44.4±0.28
Fat (%)	33.14±0.02	17.49±0.43
Fibre (%)	4.01±0.01	3.45±0.07
Ash (%)	4.18±0.04	6.33±0.02
Cellulose (%)	1.01±0.04	3.755±0.56
Moisture (%)	8.23±0.01	9.48±0.24
Dry matter (%)	91.77±0.01	90.52±0.24
Carbohydrate (%)	23.05±0.82	24.57±0.25
EM (Kcal/kg)	4931.45±0.86a	3809.77±60.35b

Means followed by different letters within the same row are significantly different ($p < 0.05$); EM= metabolizable energy

3.2 Effect on carcass and organ characteristics

Table 4 presents the results of the effect of cashew oilcake incorporation in the experimental feed rations on the carcass and organ characteristics of broilers after six (6) weeks of age. Statistical analysis revealed that the carcass weight of the F0 control lot (84.001%) showed a significant difference ($P<0.05$) with the other experimental lots. On the other hand, the incorporation of cashew cakes in the feed did not result in any significant difference in the performance of the different organs, i.e. lungs, liver, gizzard, heart, abdominal fat and intestines.

Table 4 Effect of cashew oilcake on broiler organs and carcass

		Treatments			
Yield (%)	**F_0**	**F_{100}**	**F_{75}**	**F_{50}**	**F_{25}**
Carcass	$84.01±0.91_a$	$73.43±1.90_b$	$77.03±3.67_c$	$78.65±6.66_d$	$86.66±1.24_e$
Lungs	0.62±0.18	0.51±0.05	0.48±0.11	0.50±0.13	0.38±0.004
Liver	2.21±0.27	2.24±0,19	2.04±0.49	1.98±0.01	1.88±0.25
Gizzard	3.27±0.09	4.50±0.82	3.91±0.48	3.39±0.33	3.56±0.74

Heart	0.6±0.04	0.64±0.08	0.53±0.06	0.49±0.11	0.55±0.07
Abdominal fat	0.79±0.11	1.63±0.19	1.33±0.46	1.15±0.28	0.84±0.03
Intestin	5.64±0.48	7.39±1.34	5.92±1.99	4.84±0.78	5.99±0.31

Means followed by different letters within the same row are significantly different ($p < 0.05$);F0:0% substitution of soybean meal;F100:100% substitution of soybean meal;F75:75% substitution of soybean meal;F50:50% substitution of soybean meal;F25:25% substitution of soybean meal

3.3 Effect on mortality rate

The mortality rate of the birds during the experiment is presented in Table 5. The overall mortality varied between 1 and 3 at the end of our experiment. Compared to the F0 control, the mortality rate was different or comparable in the different batches.

Table 5 Effect of incorporating cashew oilcake in the feed ration on mortality rate

	Mortality rate (%)				
Treatments	**F0 (N=60)**	**F100 (N=60)**	**F75 (N=60)**	**F50 (N=60)**	**F25 (N=60)**
Start-up	3	2	1	2	1
Growth	1	0	0	0	0
Finish	0	0	0	0	0
Total death	3	2	1	2	1
Mortality rate (%)	5	3.33	1.67	3.33	1.67

F0:0% substitution of soybean meal;F100:100% substitution of soybean meal;F75:75% substitution of soybean meal;F50:50% substitution of soybean meal;F25:25% substitution of soybean meal;N=number of chickens

3.4 Effect on the sensory profile of poultry meat

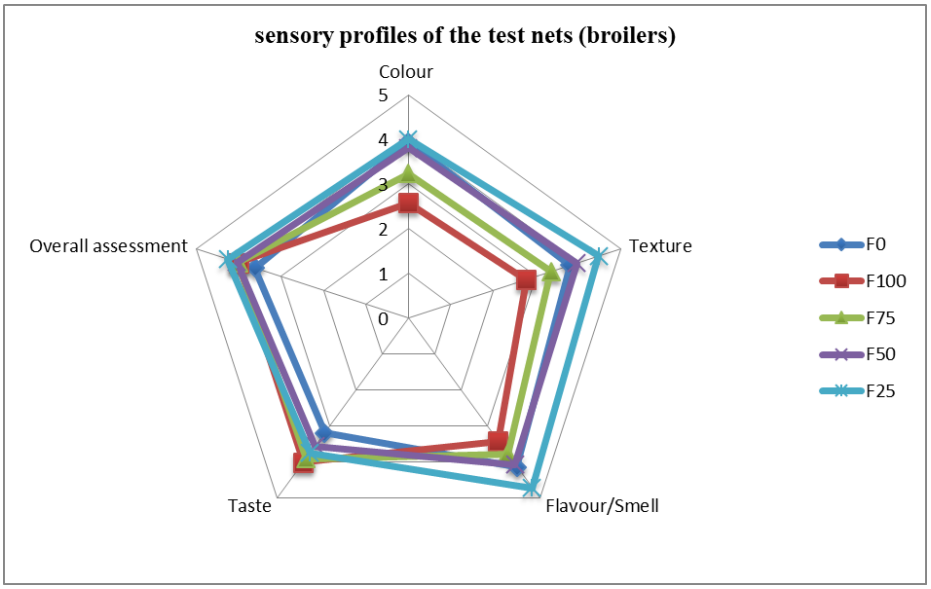

Figure 3 Effect of incorporating cashew oilcake in the broiler ration on the sensory profile of the meat

The results of the sensory evaluation of broiler meat are presented in Figure 3. The sensory profiling of chicken meat revealed a significant effect ($P<0.05$) of the incorporation of cashew oilcake in the rations on the different parameters evaluated. Indeed, during the evaluation, the intensity of colour of the meat from batches F100 (2.58) and F75 (3.23) was judged by the panel to be less white than the F0 control (3.94) but their texture was judged to be neither tender nor firm: 2.77 and 3.35 respectively. However, the meat from lot F25 was judged to be more tender with a better flavour: 4.48 and 4.71 respectively compared to the F0 control (3.81). In addition, meat from lot F100 (4) was judged by the

panel to have the best taste. In sum, the meat from the batches of poultry that consumed the rations containing cashew cakes was more appreciated compared to the control.

4 Discussion

The statistical results of the biochemical tests carried out on cashew and soybean meals in the present study are not significantly different, except for the metabolizable energy (ME). Indeed, the metabolisable energy of cashew oilcake (4931.45±0.86 Kcal/kg DM) recorded is significantly higher than that of soybean oilcake (3809.77±60.35 Kcal/kg DM). The metabolisable energy (ME) value of the present study of cashew oilcake is higher than that of Lacroix [19], which was 4883 Kcal/kg dry matter during his work on cashew. In addition, this value remains lower than that of Kouakou et al [20], which was 5516 Kcal/kg dry matter in their study. This disparity in the metabolisable energy of cashew meal can be explained by the cashew oil extraction technique. Indeed, the crushing process used to recover the oil has an impact on the crude energy contained in the meal, taking into account the residual lipid dependence of the metabolizable energy [21].

The incorporation of cashew oilcake in the poultry diet significantly ($P<0.05$) modified the carcass yield of broilers. Lot F25 showed the highest yield with 86.66%, followed by the control lot F0 (84.01%), then lot F50 (78.65%), lot F75 (77.03%) and finally lot F100 (73.43%). The carcass yields obtained in the present study are better than those obtained by Kana et al [22] (70.95-73.51%) in their work on the zootechnical performance of broiler chickens fed a diet based on cassava residues supplemented with spirulina (*Spirulina platensis*). The results obtained are similar to those obtained by Diomandé et al [23] (64-94%), these authors having worked on the incorporation of snail meal (*Achatina fulica*) in broiler rations in Côte d'Ivoire. These results could be justified by the variable rate of metabolisable energy of the different rations used in the different experiments.

As for the organs (liver, gizzard, heart, lungs and intestine) and abdominal fat of the chickens fed the different diets formulated with cashew oilcake, no significant difference ($P<0.05$) was found compared to the control lot. This result could indicate that the incorporation of cashew oilcake in the poultry feed did not have depressive effects on their development. The lack of difference between the organ weights of the experimental and control batches indicates that the ingredients used do not appear to pose a health hazard to the chickens. Indeed, these organs play an important role in the detoxification of toxic feed by-products and in the grinding of feed [24]. According to [25], the increase in liver weight may be related to the need for this organ to increase its efficiency in detoxification of toxic by-products. The liver is generally the organ most affected during a toxic attack and this is accompanied by hepatomegaly according to Raharimalala [26].

Furthermore, at the organoleptic level, the sensory test of the meat of the broilers carried out by the panel reveals that the colour of the meat of the F50 and F25 batches is white in agreement with the F0 control batch. In contrast to the control lot F0, the meat of the subjects of lots F75 and F100 were judged by the panelists as being neither red nor white and red respectively. This means that cashew oil cakes modify the colour of broiler meat, which is classified as white meat. This colouring is even more accentuated with the degree of incorporation of the oil cakes in the ration. These results are contrary to those of Diomandé et al [23], who showed no impact of snail meal on the colour of broiler meat. This change in meat colour could be due to the acidity of the cashew meal. Indeed, the shell surrounding the cashew kernel contains a liquid called balsam which is very acidic and can therefore influence the degree of acidity of the oilcake [27].

The juiciness or succulence characterises the exudation capacity of the meat at the time of tasting. It is the most important factor influencing the water retention capacity of the muscle [28]. The water retention capacity influences the juiciness of the meat [29]. It reflects the binding strength between water and proteins in the muscle fibre. Water retention depends on the spatial structure of the muscle fibre proteins. The results obtained in the sensory evaluations of this trial show that the meat of the chickens fed F100, F75 and F25 rations was judged more succulent with a score of 4/5; 3.9/5 and 3.74/5 respectively by the panel compared to the F0 control (3.19/5). It can therefore be stated that the incorporation of cashew cakes in the ration would modify the juiciness of the poultry meat. According to [30], juiciness, or the impression of juice release during chewing, is related to the amount of free water remaining in the meat and to the secretion of saliva stimulated mainly by lipids, and it varies with the water retention capacity of the meat.

The texture of the meat is represented by its tenderness or firmness. Tenderness is the ease with which a meat can be sliced and chewed, the opposite of hard or firm meat that is difficult to chew. Several authors have shown that tenderness is the most important sensory quality for the meat consumer [31]. The panel judged the meat of the F100 and F75 batches to be less tender, with scores of 2.77/5 and 3.35/5 respectively, compared to the control batch F0

(3.81/5). In addition, the meat of birds from batches F50 (3.97/5) and F25 (4.48/5) was judged more tender compared to the control batch F0. These results are superior to those obtained by Gnakri et al [32] in their study on body growth and organoleptic quality of meat from broiler and African chicken and their crossbreeding (Ivory Coast). The incorporation of cashew cakes would modify the texture of chicken meat. These results are in agreement with those of Diomandé et al [23] who indicated that snail meal would increase the firmness of chicken meat.

Flavour, which is the set of olfactory and gustatory perceptions perceived when consuming a product [33], is determined by the chemical composition and the changes made to the meat during maturation and subsequent cooking [34]. The flavour of the meat from batches F50 and F25 was judged to be pleasant and that of batch F100 and F75 was judged (neither pleasant nor unpleasant) in comparison to the control batch. Cashew oilcake is believed to contain aromatic compounds that are transferred to the chicken meat during metabolism. These results confirm those of Diomandé et al [23] who showed that the smell of animal meal is found in the meat of animals that have consumed it.

Overall, the meat from the five (5) batches was judged good by all consumers. However, the meat from the batches of poultry that had consumed cashew meal-based rations was much more appreciated by the tasters, particularly batch F25. The different assessments of the panel of tasters are probably a function of their dietary habits [35].

5 Conclusion

At the end of this study, it was found that the incorporation of cashew oilcake in the poultry feed significantly modified the carcass yield rate of broilers. Lot F25 showed the highest carcass yield with 86.66% and lot F100 (73.43%) the lowest. On the other hand, the organ yield (liver, gizzard, heart, lungs and intestine) and abdominal fat of the experimental chickens did not show significant difference ($P<0.05$) compared to the control lot. This result could indicate that the incorporation of cashew oilcake in the poultry feed had no depressive effects on organ development with a very low mortality rate (1.67-3.33%).

In addition, organoleptically, the colour of the meat of batches F50 and F25 was judged as white in agreement with the control batch F0, unlike batches F75 and F100 which were judged by the panelists as being respectively: neither red nor white and red. Secondly, the meat of the chickens fed with the F100, F75 and F25 rations was judged more succulent respectively with a score of 4/5; 3.9/5 and 3.74/5 by the panel compared to the F0 control (3.19/5). In addition, the panel judged the meat from batches F100 and F75 to be less tender with scores of 2.77/5 and 3.35/5 respectively, and those from batches F50 (3.97/5) and F25 (4.48/5) to be more tender compared to the control batch F0 (3.81/5). Overall, the meat from the five (5) lots was judged good by all consumers. However, the meat from the batches of poultry that consumed cashew cake-based rations was much more appreciated, especially batch F25.

In sum, the lack of difference between the organ weights of the experimental and control batches shows that the ingredients used do not seem to present a health hazard to the chickens, and that cashew oilcake can be used in broiler feed.

Compliance with ethical standards

Acknowledgments

We acknowledged the entire staff of the Agrovalorisation Laboratory of jean Lorougnon Guede University for providing technical assistance during this research.

Disclosure of conflict of interest

All The author declare no conflict of interest

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