extract, nitrogen-free extract and metabolizable energy. The effects of cassia leaf meal inclusion in village chickens diets on the digestibility and metabolic utilization of different nutrients, FI, ADWG and FCR are shown in table 1.

Table 1 *Effects of the incorporation of* Cassia tora *leaves meal in diets on FI, ADWG, FCR and nutrients utilization*

	Dietary Treatments					
Parameters	CT_0	CT_5	CT_{10}	CT_{15}	SEM	*P*
Daily feed intake (g DM/bird)	62,13 ± 15,03	64,99 ± 14,40	60,83 ± 10,10	59,14 ± 8,13	2.56	0.89
ADWG (g/day)	12,65 ± 6,07	10,16 ± 7,11	12,64 ± 6,15	12,07 ± 5,47	1.29	0.91
FCR (g/g ADWG)	6,23 ± 2,76	8,88 ± 3,94	6,18 ± 2,82	5,96 ± 2,07	0.67	0.38
Daily excreta (g DM/bird)	19,41 ± 4,60	16,92 ± 2,71	16,84 ± 3,20	17,76 ± 0,91	0.68	0.55
ACNU-Dry Matter	0.685 ± 0.030	0.735 ± 0.029	0.721 ± 0.043	0.696 ± 0.034	0.84	0.13
ACNU-Organic Matter	0.719 ± 0.027	0.756 ± 0.027	0.7424 ± 0.040	0.717 ± 0.032	0.75	0.20
ACNU-Crude Protein	0.453 ± 0.052^{a}	0.530 ± 0.053^{b}	0.478 ± 0.081^{ab}	0.400 ± 0.068^{a}	1.71	**0.04**
ACNU-Ether extract	0.832 ± 0.016^{a}	0.864 ± 0.015^{b}	0.813 ± 0.029^{a}	0.779 ± 0.024^{c}	0.83	**0.00**
ACNU-Crude fiber	0.165 ± 0.080^{a}	0.426 ± 0.064^{b}	0.576 ± 0.065^{c}	0.528 ± 0.053^{c}	3.89	**0.00**
ACNU-Nitrogen Free Extract	0.835 ± 0.016	0.855 ± 0.016	0.850 ± 0.023	0.854 ± 0.016	0.41	0.34
ACNU-Ash	0.160 ± 0.081^{a}	0.483 ± 0.058^{b}	0.477 ± 0.081^{b}	0.462 ± 0.061^{b}	3.45	**0.00**
ACNU-Metabolisable Energy	0.786 ± 0.020	0.814 ± 0.021	0.782 ± 0.033	0.765 ± 0.026	2.99	0.06

Conclusions

Except for ether extract, the inclusion of *Cassia tora* leaf meal in indigenous chicken diets at 15% level has no significant adverse effect on nutrient and energy utilization, feed intake, ADWG, and FCR of these birds. It significantly improved the crude fiber and ash utilization for 5% dietary treatment.

Acknowledgements

The authors are grateful to National Fund of Agricultural and Food Research of Senegal for financing this study and to Priority Fund for solidarity of French Cooperation.

doi:10.1017/S204047001000052X

Digestibility, metabolic utilization and nutritional value of *Leuceana leucocephala* (Lam.) leaf meal incorporated in indigenous Senegal chickens diets

S. B. Ayssiwede[1†], A. Dieng[2], C. Chrysostome[3], W. Ossebi[1], J. L. Hornick[4] and A. Missohou[1]

[1]Laboratory of Animal Nutrition of Veterinarian Regional School (EISMV), Dakar (Senegal); [2]Laboratory of Bromatology of Superior National School of Agriculture, Thiès (Senegal); [3]Faculty of Agronomical Science, University of Abomey-Calavi (Benin); [4]Animal Nutrition Service, Faculty of Veterinarian Medicine of Liege University (Belgium)

Introduction

Indigenous chicken production is confronted with various constraints in which feed is a major challenge. Besides the lack of dietary supplement, village chickens face quantitative and qualitative feed shortages particularly in a poor agricultural or household residues environment. Moreover, because of the increasingly cost of common protein ingredients (groundnut cake, soybean or fish meal) traditional stockholders often have little access to such resources. However, studies carried out on legumes reported that the leaves of *Leuceana leucocephala*, are rich in protein, essential amino acids and minerals. This raises the prospect of using *Leuceana leucocephala* leaf meal as a source of protein in Senegal indigenous chickens diets. This study was undertaken to determine the nutrient utilization and nutritional value of *Leuceana leucocephala*.

† E-mail: s.ayssiwede@eismv.org

Materials and methods

Leuceana leucocephala leaves were collected mainly in the region of Thies, 70 km from Dakar. They were dried for 1–2 days and processed into meal using a grinder mesh 4 mm in diameter. The leaf meal and other common ingredients (yellow maize, white sorghum, millet, wheat bran, fish meal, and groundnut cake) were analysed for their composition using AFNOR technical. These ingredients were used to formulate four iso-nutrient calculated dietary treatments (LL_0, LL_7, LL_{14} and LL_{21}) containing respectively 0, 7, 14 and 21% of *Leuceana* leaves meal. The leuceana leaf diets were supplemented with ferric sulphate according to D'Mello and Acamovic (1989). Experiments were undertaken from 1st to 13th, December 2009. Twenty adult indigenous chickens with an average weight of 1.22 kg were raised in metabolic cages and allocated into four dietary treatments groups of five birds each. During the experiment, feed offered and fresh excreta collected were weighted daily for six days. The droppings were oven-dried at 60°C and ground for nutrient analysis per bird. Daily feed intake (DFI) and average daily weight gain (ADWG) were calculated and apparent coefficients of nutrient utilization (ACNU) were determined according to the following formula: ACNU = (NI − NF) ÷ NI, where NI was nutrient intake and NF nutrient excreted. Data were analysed at 5% level by variance analysis (ANOVA) completed with t-test when ANOVA showed significant difference.

Results

The *Leuceana leucocephala* leaf meal was relatively rich in protein (24.95% DM), ether extract (6.36% DM), nitrogen-free extract (43.1% DM), crude fiber (14.20% DM), NDF (22.38% DM). It contained 2050.47 kcal/kg DM of metabolizable energy and 11.37% DM of ash, particularly calcium (1.8%) and potassium (1.1% DM). The effects of leuceana leaves meal inclusion in village chickens diets on the digestibility and metabolic utilization of different nutrients, FI, ADWG and FCR are shown in table 1.

Table 1 *Effects of the incorporation of* Leuceana leucocephala *leaves meal in diets on DFI, ADWG, FCR and nutrients utilization*

	Dietary Treatments					
Parameters	LL_0	LL_7	LL_{14}	LL_{21}	SEM	*P*
Daily feed intake (g DM/bird)	55.66 ± 12.71	62.11 ± 15.08	43.49 ± 4.31	60.36 ± 16.80	3.17	0.147
ADWG (g/day)	9.89 ± 3.98	13.09 ± 7.07	9.14 ± 7.44	12.26 ± 3.17	1.23	0.663
FCR (g/g ADWG)	6.59 ± 1.13	6.13 ± 2.25	11.55 ± 12.45	5.63 ± 1.61	1.42	0.453
Daily excreta (g DM/bird)	15.55 ± 2.42	12.99 ± 2.41	12.83 ± 3.57	16.98 ± 4.76	0.81	0.200
ACNU-Dry Matter	0.722 ± 0.019	0.788 ± 0.016	0.701 ± 0.095	0.719 ± 0.028	1.30	0.074
ACNU-Organic Matter	0.748 ± 0.017	0.811 ± 0.014	0.726 ± 0.087	0.741 ± 0.026	1.21	0.054
ACNU-Crude Protein	0.493 ± 0.035[a]	0.640 ± 0.027[b]	0.470 ± 0.168[a]	0.497 ± 0.051[a]	2.42	**0.036**
ACNU-Ether extract	0.887 ± 0.007[a]	0.887 ± 0.008[a]	0.818 ± 0.057[b]	0.819 ± 0.018[b]	1.00	**0.002**
ACNU-Crude fiber	0.056 ± 0.064[a]	0.133 ± 0.067[b]	0.174 ± 0.262[b]	0.233 ± 0.078[b]	3.31	0.304
ACNU-Nitrogen Free Extract	0.851 ± 0.010	0.888 ± 0.008	0.842 ± 0.050	0.854 ± 0.014	0.67	0.083
ACNU-Ash	0.367 ± 0.043	0.487 ± 0.039	0.388 ± 0.194	0.443 ± 0.056	2.42	0.304
ACNU-Metabolisable Energy	0.814 ± 0.012[a]	0.873 ± 0.009[b]	0.801 ± 0.062[a]	0.824 ± 0.017[a]	0.93	**0.022**

Conclusions

The inclusion of *Leuceana leucocephala* leaf meal in indigenous chickens' diets at 21% level has no significant adverse effect on nutrient and energy utilization, feed intake, ADWG, and FCR of these birds. It significantly improved the digestibility and metabolic utilization of the most of nutrients at 7% dietary treatment.

Acknowledgements

The authors are grateful to National Fund of Agricultural and Food Research of Senegal for financing this study and to Priority Fund for solidarity of French Cooperation.

https://doi.org/10.1017/S204047001000052X Published online by Cambridge University Press