

Nutritional Effect of *Stylosanthes guianensis* on Growth Parameters, Feed Efficiency, Health and Reproductive Performance in Improved-Breed Rabbits

Sangaré Sidiki^{1*}, Ouattara Adidjatou¹, Silue Fatogoma Etienne², Kimse Moussa³, Alassane Méité¹

¹Biology and Health Laboratory, Biosciences, Félix Houphouët-Boigny University, Abidjan, Cote d'Ivoire

²Training and Research Unit of Agriculture, Fisheries and Agro-Industry, University of San Pedro, San Pedro, Cote d'Ivoire

³Laboratory of Animal Biology and Cytology, Animal Production Research Unit, UFR of Natural Sciences, University of Nangui Abrogoua, Abidjan, Cote d'Ivoire

Email: *sidiki.sangare@ufhb.edu.ci

How to cite this paper: Sidiki, S., Adidjatou, O., Etienne, S.F., Moussa, K. and Méité, A. (2026) Nutritional Effect of *Stylosanthes guianensis* on Growth Parameters, Feed Efficiency, Health and Reproductive Performance in Improved-Breed Rabbits. *Journal of Biosciences and Medicines*, 14, 52-62.

<https://doi.org/10.4236/jbm.2026.1410004>

Received: August 19, 2026

Accepted: October 10, 2026

Published: October 13, 2026

Copyright © 2026 by author(s) and Scientific Research Publishing Inc. This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

Abstract

Objective: This study aimed to evaluate the nutritional effects of *Stylosanthes guianensis* on feed intake, feed efficiency and reproductive performance in improved-breed rabbits (*Oryctolagus cuniculus*, Californian x New Zealand hybrids). **Methods:** A total of 300 breeding animals aged 90 days (240 females and 60 males) were used. Two groups were formed: a control group (C) fed a commercial alfalfa-based diet, and an experimental group (Sg) fed a pelleted diet formulated with *S. guianensis*. Growth, intake, health and reproductive parameters were recorded in females followed from 90 to 174 days (growth) and 90 to 239 days (reproduction). **Results:** Mean body weight, average daily gain, and feed intake did not differ significantly between groups ($P > 0.05$), except for the feed conversion ratio between 119 and 146 days, which was higher in the Sg group (6.3 vs. 5.6; $P = 0.02$). Mortality and the health risk index were significantly lower in the Sg group throughout the rearing period (6.7% vs. 16.7% and 26.6% vs. 40%, respectively; $P < 0.05$). Receptivity (80% vs. 74%), kindling rate (76.6% vs. 66.66%), and fertility (95.8% vs. 90.9%) did not differ significantly between groups ($P = 0.29$, $P = 0.14$, and $P = 0.24$, respectively), although numerically higher values were observed in the Sg group. The numbers of kits born alive and weaned were significantly higher in the Sg group. Stillbirth approached statistical significance ($P = 0.05$) and pre-weaning mortality did not differ significantly between groups ($P = 0.08$), while total mortality was significantly lower in the Sg group ($P = 0.008$). **Conclusion:** *Stylosanthes guianensis* therefore represents an effective alternative fibre source

for feeding improved-breed breeding rabbits.

Keywords

Rabbit, Improved Breed, *Stylosanthes guianensis*, Feed, Reproduction, Health, Mortality

1. Introduction

For several years, rabbit farming has established itself as a promising sector for quality meat production and income diversification in developing countries [1]. This interest stems in particular from the rabbit's zootechnical performance: high prolificacy, with 8 to 10 kits per litter, combined with a short gestation period of approximately 30 days [2]. In addition, its meat is valued for its organoleptic and nutritional qualities, being reputedly tender, flavorful and low in fat [3]. In Cote d'Ivoire, this activity is also attracting growing interest among the population [4].

However, the development of rabbit farming remains constrained by several factors, among which feed quality and high feed cost occupy a central place [5], [4], feed alone accounting for more than 70% of production costs [6]. In the rabbit diet, an adequate fibre supply is essential for proper digestion. As a monogastric herbivore, this animal requires a minimum threshold of dietary fibre to prevent digestive disorders. Alfalfa, the main fibre source used in Cote d'Ivoire, has the dual disadvantage of being imported and of substantially raising the cost of industrial feed. This economic constraint leads some manufacturers to market pelleted feeds that are under-dosed in fibre (<16% ADF), exposing rabbitries to digestive disorders, growth retardation and excess mortality [7].

In this context, identifying a local fibre source with a lignocellulose (ADF) content of between 19 and 20% appears necessary for formulating an economical feed capable of preserving caecal ecosystem balance and limiting the risk of digestive pathologies [8].

It is in this perspective that the tropical legume *Stylosanthes guianensis* has been the subject of several studies evaluating its potential as a fibre source in rabbit feeding [7] [9]. This forage is notable for its appreciable content of digestible protein (100 - 200 g/kg), fibre (30% to 38%) and polyunsaturated fatty acids [10], making it a relevant candidate to replace alfalfa as the main fibre source in rabbit feeding under tropical conditions.

The present study therefore aimed to formulate an *S. guianensis*-based diet for breeding rabbits and to evaluate its effects on weight gain, as well as on the reproductive and health performance of kits and their mothers.

2. Materials and Methods

2.1. Group Formation and Experimental Diets

The rabbits used in this study were *Oryctolagus cuniculus* hybrids resulting from

crosses between Californian and New Zealand White breeds. A total of 300 breeding animals, comprising 240 females and 60 males aged 90 days with a mean weight of 1890 $\pm$ 14 g, were used. Growth performance and health status were assessed using 60 females, divided into two groups of 30 rabbits each (group C and group Sg), with measurements taken up to 174 days of age. Reproductive parameters required an additional 180 nulliparous females, likewise divided into two groups (group C and group Sg) of 90 females each with 30 males, with measurements taken between 90 and 239 days of age. All animals were housed in individual cages measuring 0.30 m² (length: 70 cm; width: 40 cm; height: 30 cm).

Animals were fed restricted rations of 100 g between 90 and 118 days of age, 120 g between 119 and 146 days, and 150 g between 147 and 174 days. Group C animals were fed a commercial industrial feed containing alfalfa, produced in Cote d'Ivoire (**Table 1**). Group Sg animals were fed a pelleted feed with *S. guianensis* as the fibre core. The Sg feed was produced at Nangui Abrogoua University. The ingredients used were cereals and cereal by-products, with maize serving as the main energy source. The protein sources were soybean meal and cottonseed meal. The main fibre source was dehydrated *Stylosanthes guianensis*. The mineral sources consisted of marine-origin shell materials and table salt. An anticoccidial agent and a vitamin complex were added to the feed formulation. Sugarcane molasses was used as a binder.

The ingredients of the commercial feed, as provided by the supplier, consisted of maize, soybean meal, rice bran, oyster shell, and a fibre core composed of dehydrated alfalfa. The chemical composition of the feeds used is summarized in **Table 1**. The two diets were isoproteic.

All animals had ad libitum access to drinking water. No veterinary treatment was administered during the experimental period.

Table 1. Theoretical chemical composition* of the experimental diets.

Chemical composition (%)	Diet C	Diet Sg
DM	90.33	88.9
EE	2.40	2.6
CP	15.4	17.2
NDF	21.10	32.6
ADF	14.03	19.3
ADL	2.50	4.6
NFE	23.73	24.6
Energy (kcal/kg)	1811	2401

*The chemical composition of commercial brand diet C was provided by the company.

2.2. Measurement of Intake, Growth, Health and Reproductive Parameters

Feed intake was monitored daily. The amount of feed consumed was determined

as the difference between the previously weighed amount of feed offered and the amount of feed refused.

Growth monitoring of the does was performed through weekly weighing using a Terrailon® electronic scale with a capacity of 10 kg and a precision of 1 g.

Diarrheic animals were identified as “M”, while animals showing a decrease in feed intake or body weight were recorded as “B”. Animals identified as B or M were considered morbid and were monitored daily (feed intake and body weight) until recovery or death. Thus, the Health Risk Index (HRI) was assessed by adding the number of morbid animals to the number of dead animals.

For the assessment of reproductive parameters, does were mated with bucks from 120 days of age. The interval between kindling and mating was 20 days. Females that did not accept mating were re-presented to the buck the following day; thereafter, they were considered non-receptive. Matings were performed either in the morning (6:00 - 7:00 a.m.) or in the evening (6:00 - 7:00 p.m.).

Nest checks were performed as soon as kindling occurred, allowing the number of kits born, the number of stillborn kits, and the health status of the doe to be determined. In does, receptivity, fertility, and kindling rate (KR) were calculated. Receptivity was defined as the ratio of the number of does successfully mated to the total number of does presented to the buck. Fertility was calculated as the ratio of the number of does that kindled to the number of does successfully mated. Kindling rate was determined as the ratio of the number of kindlings to the total number of mating attempts performed.

Numerical productivity was characterized by the total number of kits born per kindling (TB), the number of kits born alive (BA) per kindling, and the number of kits weaned (W) per kindling per doe cage. The health status of kits in the nest was determined as the ratio of the number of stillborn kits to the total number of kits born.

2.3. Statistical Analysis

Mean weight, weight gain and feed conversion ratio of rabbits in the two groups were compared using Student's t-test. The G-test was used to compare proportions relating to reproductive parameters such as receptivity, fertility, kindling rate and numerical productivity. The same test was applied to compare mortality-related parameters such as morbidity, mortality and the health risk index. Parameters recorded for the two groups were compared using R statistical software, version 3.1.0, at a 5% significance threshold.

3. Results

3.1. Effect of *Stylosanthes guianensis* on Growth and Feed Intake

Table 2 presents the growth performance parameters of improved-breed rabbits. Growth parameters (mean weight and ADG) as well as feed intake did not differ significantly between the two groups ($P > 0.05$), except for the feed conversion ratio (FCR) between 119 and 146 days of age. Mean doe weight was 1900 g in

group C and 1910 g in group Sg at 90 days of age ($P = 0.37$). At 118, 146 and 174 days, it reached 2532.1 g and 2592.6 g ($P = 0.31$), 3100.6 g and 3104.8 g ($P = 0.21$), and 3544.3 g and 3552.1 g ($P = 0.94$), respectively, for groups C and Sg. ADG, similar between groups over the whole rearing period (20.3 g/day for C vs 20.8 g/day for Sg; $P = 0.81$), was 24.4 g/day and 25.3 g/day between 90 and 118 days ($P = 0.31$), 19.0 g/day and 21.1 g/day between 119 and 146 days ($P = 0.11$), and 16.5 g/day and 16.6 g/day between 147 and 174 days ($P = 0.23$) for groups C and Sg, respectively. Daily intake was also similar between groups C and Sg over the whole period (117 g vs 118 g; $P = 0.20$), with 102 g and 105 g between 90 and 118 days ($P = 0.77$), 119 g and 118 g between 119 and 146 days ($P = 0.11$), and 129 g and 132 g between 147 and 174 days ($P = 0.64$). FCR was similar between groups C and Sg over the whole 90-174-day period (5.9 vs 6.1; $P = 0.81$), as well as between 90 and 118 days (4.4 vs 4.2; $P = 0.4$) and between 147 and 174 days (7.8 vs 8; $P = 0.21$). In contrast, between 119 and 146 days of age, FCR was significantly higher in group Sg than in group C, at 6.3 vs 5.6 ($P = 0.02$).

Table 2. Growth performance and feed efficiency of future breeding does fed the C and Sg diets.

Groups		C	Sg	P > F
n		30	30	
Mean weight (g)	90 d	1900	1910	0.37
	118 d	2532.1	2592.6	0.31
	146 d	3100.6	3104.8	0.21
	174 d	3544.3	3552.1	0.94
ADG (g/day)	90 - 118 d	24.4	25.3	0.31
	119 - 146 d	19.0	21.1	0.11
	147 - 174 d	16.5	16.6	0.23
	90 - 174 d	20.3	20.8	0.81
Feed intake (g/day)	90 - 118 d	102	105	0.77
	119 - 146 d	119	118	0.11
	147 - 174 d	129	132	0.64
	90 - 174 d	117	118	0.20
FCR	90 - 118 d	4.4	4.2	0.4
	119 - 146 d	5.6	6.3	0.02
	147 - 174 d	7.8	8	0.21
	90 - 174 d	5.9	6.1	0.81

C: control diet containing commercial-brand alfalfa; Sg: formulated diet containing *Stylosanthes guianensis*.

3.2. Effect of *Stylosanthes guianensis* on Health

Table 3 presents the health results for improved-breed does ($n = 30$ does per group at the start of the trial). Between 90 and 118 days of age, morbidity (6.7%

for Sg vs 3.3% for C; $P = 0.24$) and HRI (6.7% vs 10.0%; $P = 0.89$) did not differ between groups. In contrast, mortality was significantly higher in group C (6.7%) than in group Sg (0.0%) during this period ($P = 0.04$). Between 119 and 146 days of age, morbidity (10.0% vs 14.3%; $P = 0.51$) and mortality (3.3% vs 7.1%; $P = 0.21$) remained similar between groups Sg and C, whereas HRI was significantly higher in group C (21.4%) than in group Sg (13.3%) ($P = 0.02$). Between 147 and 174 days of age, no significant difference was observed between groups for morbidity (3.4% vs 7.7%; $P = 0.28$), mortality (3.4% vs 3.8%; $P = 0.81$) or HRI (6.9% vs 11.5%; $P = 0.45$). Over the whole rearing period (90 - 174 days), morbidity was similar between groups Sg and C (20.0% vs 23.3%; $P = 0.61$). In contrast, mortality (6.7% vs 16.7%; $P = 0.04$) and HRI (26.6% vs 40.0%; $P = 0.01$) were significantly higher in group C than in group Sg.

Table 3. Health of improved-breed breeding does fed the C and Sg diets.

Age (days)/n	Sg	C	P value
90 - 118 d	30	30	
Morbidity	2 (6.7%)	1 (3.3%)	0.24
Mortality	0 (0.0%)	2 (6.7%)	0.04
HRI	2 (6.7%)	3 (10.0%)	0.89
119 - 146 d	30	28	
Morbidity	3 (10.0%)	4 (14.3%)	0.51
Mortality	1 (3.3%)	2 (7.1%)	0.21
HRI	4 (13.3%)	6 (21.4%)	0.02
147 - 174 d	29	26	
Morbidity	1 (3.4%)	2 (7.7%)	0.28
Mortality	1 (3.4%)	1 (3.8%)	0.81
HRI	2 (6.9%)	3 (11.5%)	0.45
90 - 174 d	30	30	
Morbidity	6 (20.0%)	7 (23.3%)	0.61
Mortality	2 (6.7%)	5 (16.7%)	0.04
HRI	8 (26.6%)	12 (40.0%)	0.01

Sg: formulated diet containing *Stylosanthes guianensis*; C: control diet containing commercial-brand alfalfa; HRI: health risk index.

3.3. Reproductive Performance and Numerical Productivity of Does Fed the C and Sg Diets

Table 4 presents the reproductive performance and numerical productivity of females according to dietary treatment. Receptivity, kindling, and fertility rates did not differ significantly between the two groups. The overall mean values were 76.7% for receptivity, 71.6% for kindling rate, and 93.4% for fertility, with no significant differences between dietary treatments.

The total number of kits born per kindling was also comparable between the

two groups, with a mean of 5.6 kits per kindling ($P = 0.27$). In contrast, the number of kits born alive was significantly higher in females receiving the Sg diet, with 5.1 kits compared with 4.7 in females from the C group ($P = 0.01$). Similarly, the number of weaned kits was significantly higher in the Sg group, with 4.5 kits compared with 3.9 in the C group ($P = 0.04$).

Table 4. Reproductive performance and numerical productivity... fed the C and Sg diets.

Parameters/n	Sg	C	P value
n	90	90	
Receptivity rate	80%	74%	0.29
Kindling rate	76.6%	66.6%	0.14
Fertility rate	95.8%	90.9%	0.24
TB	5.7	5.4	0.27
BA	5.1	4.7	0.01
W	4.5	3.9	0.04

TB: total born; BA: born alive; W: weaned.

3.4. Health of Kits Born to Does Fed the C and Sg Diets

Table 5 presents stillbirth and mortality rates of kits born to females receiving the two dietary treatments. Kits born to females fed the Sg diet showed numerically lower stillbirth and total mortality rates than those born to females fed the C diet.

Stillbirth was 8.4% among kits from the Sg diet versus 13% among those from the C diet, a difference bordering on statistical significance ($P = 0.05$). Mortality between birth and weaning did not differ significantly between groups (8% vs. 12.4%; $P = 0.08$), although a trend favoring the Sg diet was observed. In contrast, total mortality was significantly lower among kits born to females receiving the Sg diet (15.7%) than among those born to females receiving the C diet (23.7%; $P = 0.008$), indicating a statistically significant effect of dietary treatment on overall kit survival during the period considered.

Table 5. Stillbirth and mortality of kits born to improved-breed parents.

Parameters/n	Sg	C	P value
n kits	393	324	
Stillbirth	33 (8.4%)	42 (13%)	0.05
Mortality B-W	29 (8%)	35 (12.4%)	0.08
Total mortality	62 (15.7%)	77 (23.7%)	0.008

4. Discussion

The present study aimed to formulate, from *Stylosanthes guianensis*, a diet for improved-breed breeding does (Californian x New Zealand White hybrids), and to assess its impact on growth, health and reproductive performance of the does as well as on the viability of their offspring. Two groups were monitored in paral-

lel: a control group (C) receiving a commercial alfalfa-based feed, and an experimental group (Sg) receiving a feed formulated around *S. guianensis* as the fibre source.

In terms of body weight, the inclusion of *S. guianensis* did not impair the growth of future breeding does: live weight and average daily gain remained statistically comparable between the two groups at each stage considered (90, 118, 146 and 174 days). Daily intake likewise did not differ between groups, reflecting a satisfactory level of palatability of the experimental feed despite a fibre content (ADF around 19%) markedly higher than that of the control feed. This result is consistent with the principle that rabbit intake mainly contracts when fibre supply becomes insufficient relative to the physiological needs of the species [11] [12]: *S. guianensis* would thus provide a fibre level compatible with normal digestive function. Only the feed conversion ratio calculated between 119 and 146 days was significantly higher in group Sg, although this isolated difference did not translate into a growth difference over the whole period, which limits its zootechnical significance.

From a health perspective, does in group Sg showed, over the whole rearing phase (90 - 174 days), significantly lower mortality and health risk index than group C. This advantage was particularly marked at the very beginning of the period (90 - 118 days) for mortality, and in the middle of the period (119 - 146 days) for the health risk index. Such an improvement, achieved with equivalent intake and growth, suggests that the benefit does not stem from a simple quantitative feed effect but rather from a better nutritional balance or improved digestibility of the *S. guianensis*-based diet, likely to preserve the caecal ecosystem of the breeding does.

The reproductive parameters did not show statistically significant differences between the groups in this study. Receptivity, kindling rate, and fertility were numerically higher in females from the Sg group, although they did not reach the significance threshold ($P = 0.29$, $P = 0.14$, and $P = 0.24$, respectively). This lack of statistical significance is consistent with findings reported in some studies, in which receptivity and fertility are primarily attributed to the animal strain rather than to diet composition [13]. Nevertheless, the consistently favorable trend observed in the Sg group for these three parameters may reflect a real biological effect of the diet, the statistical detection of which would probably require larger sample sizes.

Regarding numerical productivity, the total number of kits born did not differ between groups, whereas the number of kits born alive and weaned was significantly higher in females from the Sg group. In contrast, stillbirth was numerically lower in the Sg group and approached statistical significance ($P = 0.05$), while mortality between birth and weaning, although also numerically lower, did not differ significantly between groups ($P = 0.08$). Since kits depend exclusively on maternal milk during the first three weeks of life, the significant increase in the number of kits born alive and weaned nevertheless suggests that *S. guianensis* may

exert a beneficial effect on the quality and/or quantity of milk produced, as previously observed with certain forages in does [13], a finding further supported by the significantly lower total mortality observed in the Sg group ($P = 0.008$), consistent with a genuine reduction in perinatal mortality in this sample. A more balanced maternal diet could therefore, in the improved breed studied, contribute to better survival of offspring after birth, an effect that should be confirmed in larger populations.

5. Conclusions

This study aimed to evaluate the effect of a pelleted feed based on *Stylosanthes guianensis* on intake, feed efficiency, health and reproductive performance of improved-breed does, as a substitute for the alfalfa conventionally used in Côte d'Ivoire.

The results show that *S. guianensis* penalized neither the growth nor the intake of future breeding does, confirming its value as an alternative fibre source able to meet the physiological requirements of the rabbit without impairing diet palatability.

From a health standpoint, the *S. guianensis*-based feed significantly reduced mortality and the health risk index of the does, reflecting a better nutritional balance of the diet.

The main contribution of this study concerns the numerical productivity of improved-breed females: the number of kits born alive and weaned was significantly increased by *S. guianensis*. Receptivity, kindling rate, and fertility showed numerically favorable trends in the Sg group, although these differences did not reach the threshold for statistical significance. Stillbirth approached statistical significance ($P = 0.05$), and total mortality was significantly reduced in the Sg group ($P = 0.008$), further supporting a favorable effect of the diet on kit survival.

Stylosanthes guianensis therefore appears to be a promising local fiber source that can replace alfalfa in the diets of improved-breed breeding females, with demonstrated health benefits, a significant reduction in kit mortality, and a positive, although partially significant, effect on reproductive performance in rabbit production systems in Côte d'Ivoire.

Acknowledgements

The authors thank the staff of the **Nutrition-Pharmacology-Toxicology Research Unit** and the **Laboratory of Biology and Health** at **Université Félix Houphouët-Boigny** for their valuable assistance. They also express their gratitude to the **Laboratory of Animal Biology and Cytology** for providing the facilities necessary to conduct the animal experiments.

Author Contributions

All authors contributed equally to the study. They made substantial contributions to the design of the study, the collection of the data, as well as the preparation and

analysis of the data. They also drafted the manuscript and gave final approval for its submission to the journal for consideration of publication.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

- [1] Husson, O., Charpentier, H., Razanamparany, C., Moussa, N., Michellon, R., Naudin, K., Razafintsalama, H., Rakotoarinivo, C., Rakotondramanana, L.S. and Seguy, L. (2008) *Stylosanthes Guianensis*. Fiches Techniques, Plantes de couverture: Legumineuses perennes, Cirad, France. <https://agritrop.cirad.fr/548136/>
- [2] Gidenne, T. (2003) Fibres in Rabbit Feeding for Digestive Troubles Prevention: Respective Role of Low-Digested and Digestible Fibre. *Livestock Production Science*, **81**, 105-117. [https://doi.org/10.1016/s0301-6226\(02\)00301-9](https://doi.org/10.1016/s0301-6226(02)00301-9)
- [3] Dalle Zotte, A. (2002) Perception of Rabbit Meat Quality and Major Factors Influencing the Rabbit Carcass and Meat Quality. *Livestock Production Science*, **75**, 11-32. [https://doi.org/10.1016/s0301-6226\(01\)00308-6](https://doi.org/10.1016/s0301-6226(01)00308-6)
- [4] Kimse, M., Coulibaly, K.A.S., Gnanda, B.I., Zongo, M., Yapi, Y.M., Fantodji, T.A. and Otchoumou, A.A. (2017) Caracterisation des systemes d'elevage cunicole dans le district d'Abidjan (Côte d'Ivoire). *Agronomie Africaine*, **29**, 185-196. <https://www.ajol.info/index.php/aga/article/view/164707>
- [5] Kouakou, N.D.V., Thys, E., Danho, M., Assidjo, E.N. and Grongnet, J.F. (2012) Effet de *Panicum maximum* sur la productivite des femelles primipares durant le cycle de reproduction chez le cobaye (*Cavia porcellus* L.). *Tropicicultura*, **30**, 24-36. <https://research.itg.be/en/publications/effet-de-panicum-maximum-sur-la-productivite-C3%A9-des-femelles-primipa/>
- [6] Gidenne, T. (2015) Dietary Fibres in the Nutrition of the Growing Rabbit and Recommendations to Preserve Digestive Health: A Review. *Animal*, **9**, 227-242. <https://doi.org/10.1017/s1751731114002729>
- [7] Kimsé, M., Yapi, M.Y., Karamoko, M., Gidenne, T., Zongo, M., Gnanda, B.I., *et al.* (2017) Effect of Tropical Green Forage Pueraria Phaseoloides Addition to a Pelleted Complete Feed on Rabbit Growth Performance and Digestion. *World Rabbit Science*, **25**, 225-231. <https://doi.org/10.4995/wrs.2017.5126>
- [8] Gidenne, T., Combes, S. and Fortun-Lamothe, L. (2012) Feed Intake Limitation Strategies for the Growing Rabbit: Effect on Feeding Behaviour, Welfare, Performance, Digestive Physiology and Health: A Review. *Animal*, **6**, 1407-1419. <https://doi.org/10.1017/s1751731112000389>
- [9] PSDEPA (2014). Plan Strategique de Developpement de l'Elevage, de la Peche et de l'Aquaculture. 102 p. <https://faolex.fao.org/docs/pdf/ivc146471.pdf>
- [10] Kimse, M., Soro, D., Bleyere, M., Yapi, J. and Fantodji, A. (2013) Apport d'un fourrage vert tropical, *Centrosema pubescens*, en complément au granulé: Effet sur les performances de croissance et sanitaire du lapin (*Oryctolagus cuniculus*). *International Journal of Biological and Chemical Sciences*, **7**, 1234-1242. <https://doi.org/10.4314/ijbcs.v7i3.29>
- [11] Guindjoubi, S. (2007) Cuniculture périurbaine dans les Niayes : situation actuelle et perspectives de développement. Thèse de doctorat en médecine vétérinaire, École Inter-États des Sciences et Médecine Vétérinaires (EISMV). Sénégal, 86 p. https://cid.eismv.org/opac_css/index.php?id=1536&lvl=notice_display&utm

- [12] Chao, H.Y. and Li, F.C. (2008) Effect of Level of Fibre on Performance and Digestion Traits in Growing Rabbits. *Animal Feed Science and Technology*, **144**, 279-291.
<https://doi.org/10.1016/j.anifeedsci.2007.10.007>
- [13] Castellini, C., Dal Bosco, A., Arias-Álvarez, M., Lorenzo, P.L., Cardinali, R. and Rebollar, P.G. (2010) The Main Factors Affecting the Reproductive Performance of Rabbit Does: A Review. *Animal Reproduction Science*, **122**, 174-182.
<https://doi.org/10.1016/j.anireprosci.2010.10.003>