

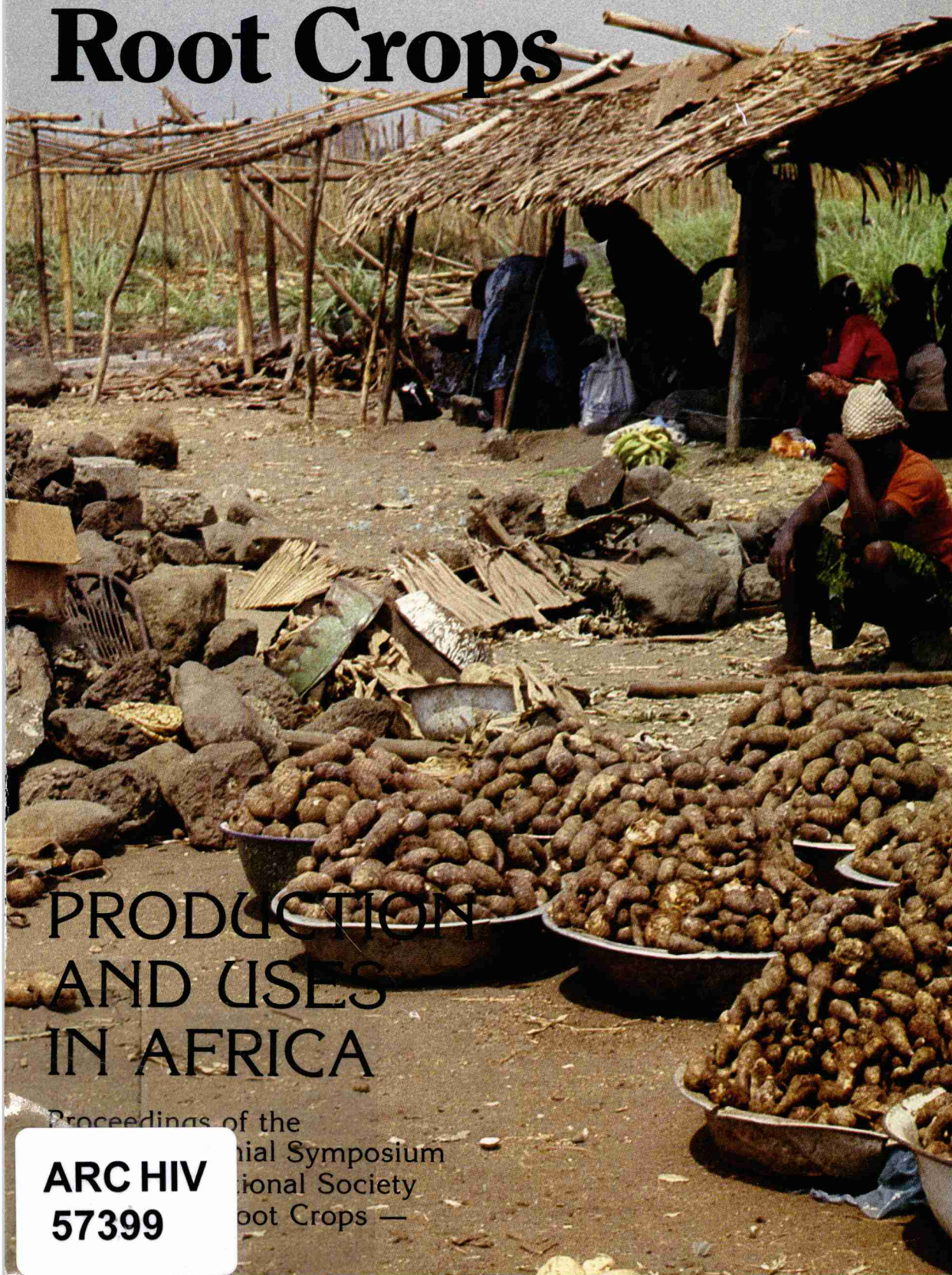
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Tropical Root Crops

PRODUCTION AND USES IN AFRICA

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The International Society for Tropical Root Crops — Africa Branch was created in 1978 to stimulate research, production, and utilization of root and tuber crops in Africa and the adjacent islands. The activities include encouragement of training and extension, organization of workshops and symposia, exchange of genetic materials, and facilitation of contacts between personnel working with root and tuber crops. The Society's headquarters are at the International Institute of Tropical Agriculture in Ibadan, Nigeria, but its executive council comprises eminent root and tuber researchers from national programs throughout the continent.

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ABSTRACT

A mixture of original research, updates on procedures, literature reviews, and survey reports, this document resulted from the second symposium of the International Society for Tropical Root Crops — Africa Branch, with 77 participants from 16 countries. The focus was cassava, yams, cocoyams, and sweet potatoes, from the perspectives of breeders, agronomists, soil specialists, plant pathologists, entomologists, nutritionists, food technologists, etc. Learning from past successes and failures, many of the researchers directed their efforts toward problems obstructing progress in reaching improved production and use of root crops and attempted to view, realistically, the context in which their results would be applied.

RÉSUMÉ

Résultats de recherches récentes, mises à jour sur les méthodes de recherche, revues de publications et rapports de sondages sont contenus dans ce document issu du Deuxième symposium de la Société internationale pour les plantes-racines tropicales — Direction Afrique, qui a réuni 77 participants de 16 pays. Des communications sur le manioc, le taro, le yam et la patate douce ont été présentées par des phytosélectionneurs, des agronomes, des pédologues, des phytopathologistes, des entomologistes et des spécialistes de la nutrition et des aliments, entre autres. Tirant leçon de leurs succès et de leurs échecs, beaucoup de ces chercheurs ont dirigé leurs efforts vers la solution des problèmes qui entravent l'augmentation de la production et de la consommation des plantes-racines et ont tenté de considérer d'un œil réaliste le contexte qui sera celui de l'application de leurs recherches.

RESUMEN

Una mezcla de investigaciones originales, actualizaciones de procedimientos, reseñas de literatura e informes de encuestas, este documento es el resultado del segundo simposio de la Sociedad Internacional de Raíces Tropicales, Filial Africana, que contó con 77 participantes de 16 países. El simposio se centró en la yuca, el ñame, el cocoñame y las batatas, desde la perspectiva de los fitomejoradores, los agrónomos, los especialistas en suelos, los patólogos vegetales, los entomólogos, los nutricionistas, los tecnólogos alimenticios, etc. A partir de los éxitos y fracasos anteriores, muchos de los investigadores encaminaron sus esfuerzos hacia los problemas que obstaculizan el avance para lograr una producción y un uso mejorados de las raíces y trataron de obtener una visión realista del contexto en que los resultados pueden ser aplicados.

TROPICAL ROOT CROPS: **PRODUCTION AND USES IN AFRICA**

EDITORS: E.R. TERRY, E.V. DOKU, O.B. ARENE, AND N.M. MAHUNGU

*PROCEEDINGS OF THE SECOND TRIENNIAL SYMPOSIUM OF THE INTERNATIONAL
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CASSAVA-BASED DIETS FOR RABBITS

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Rabbits, New Zealand White and Californian breeds, fed corn- or cassava-based diets had comparable reproductive, growth, and carcass traits, although feed intake and average daily gain were significantly ($P < 0.05$) greater for rabbits fed the cassava-based diets. It was more profitable to raise rabbits on cassava-based diets than on corn-based diets.

This study was carried out to investigate the effect of cassava root meal on the reproductive, growth, and carcass traits of two breeds of rabbits, New Zealand White and Californian.

MATERIALS AND METHODS

We obtained 23 New Zealand White and 23 Californian rabbits from the University of Ife and housed them in metallic cages 40 cm × 42 cm × 62 cm, raised 45 cm from the ground.

The rabbits were fed either corn- or cassava-based diets (Table 1). During the 4-week pregestation, gestation, and lactation phase of the study, 100–200 g of fresh *Stylosanthes guyanensis* was fed to the rabbits on the cassava-based diets as an additional source of protein and also as a replacement for the 8% fish meal used in the corn-based diet. Feed and water were given ad libitum.

The rabbits had 12 h daylight. The does were bred to bucks on the same diet. The rabbits were weaned at 4 weeks, and growth characteristics were measured until they were 8 weeks old. The young were fed the same diet as their does.

RESULTS

Neither breed nor diet affected gestation length, birth weights, average number born alive or dead, average weaning weight, or preweaning

survival, although both breeds performed slightly better when fed the cassava diet (Table 2) than when fed the corn-based diet.

The young from does fed the cassava-based diets consumed significantly ($P < 0.05$) more feed and grew faster than did the young rabbits fed the corn-based diets. Breed did not affect feed intake or growth rate, although the New Zealand White breed gained somewhat more weight than did the Californian breed. Preweaning survival was significantly ($P < 0.05$) greater for the New Zealand White breed, 88.8%, than for the Californian breed, 66.7%.

The carcass traits of these rabbits were not affected by breed or diet, although kidneys from corn-fed rabbits were significantly ($P < 0.05$) heavier than those from cassava-fed rabbits. Similarly, the Californian breed had heavier kidneys than did the New Zealand White breed. Thyroid weight and kidney fat were not affected by diet or breed.

The cash returns possible from sales of the cassava-fed rabbits would have been greater than those from the corn-based diets. Californian rabbits fed the corn-based diet were less efficient in converting feed into meat than were the others (Table 2).

DISCUSSION

Cassava levels up to 45% have been shown to support good growth in rabbits (Eshiett et al. in press) as was shown in this study. However, the New Zealand White rabbits grew faster and utilized their feed more efficiently than did the Californian rabbits. This finding suggests that

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Table 1. Test diets supplemented with palm oil and with *S. guyanensis* fed to gestating, lactating, and growing rabbits.

	Corn-based	Cassava-based	
		Growth phase	Reproduction phase
Feed components (%)			
Guinea corn	9.87	—	—
Yellow corn	29.23	12.59	11.62
Cassava flour	—	32.41	29.92
Brewers' grains	29.23	—	—
<i>Stylosanthes</i> (dry-matter basis)	—	25.93	31.09
Palm-kernel meal	—	2.96	2.73
Groundnut meal	14.70	16.16	14.91
Fish meal	8.07	3.70	3.02
Palm oil	1.15	4.62	4.62
Dicalcium phosphate	2.31	0.46	0.46
Oyster shell	2.31	—	—
Mineral-vitamin premix	0.66	0.46	0.46
Amprolium (coccidiostat)	0.66	0.46	0.46
Terramycin crumble (antibiotic)	0.66	0.46	0.46
Methionine	—	0.20	0.20
Feed value			
Energy DE (kcal/kg)	3348	2716	2616
Calcium (%)	1.38	0.10	0.40
Phosphorus (%)	0.61	0.43	0.43
Methionine-cysteine (%)	0.74	0.42	0.42
Lysine (%)	1.03	0.60	0.60
Crude protein (%)	22.53	16.06	17.15
Cost (francs CFA/kg)	101	80	86

Table 2. Effects of cassava- and corn-based diets on performance of two breeds of rabbits.

	New Zealand		Californian	
	Cassava	Corn	Cassava	Corn
Reproduction				
Gestation length (days)	29.8	30.8	30.5	31.1
Birthweight (g)	49.6	44.7	47.4	48.5
Live births/doe	5.7	5.5	6.2	5.2
Weaning weight (g)	344.1	371.1	348.1	365.6
Preweaning survival (%)	74.3	61.2	71.5	63.8
Growth				
Feed intake				
(dry matter, g/day)	64.4	52.8	65.6	54.8
Weight gain (g/day)	22.0	15.3	16.2	16.1
Feed/gain ratio	2.9	3.4	4.0	3.4
Survival after weaning (%)	93.0	94.7	70.32	62.81
Carcass				
Slaughter weight (kg)	0.8	0.7	0.7	0.7
Yield (%)	48.8	41.0	41.0	41.0
Liver (% of slaughter weight)	3.0	3.5	3.7	3.5
Kidney (% of slaughter weight)	0.7	0.8	0.8	1.3
Kidney fat (% of kidney weight)	10.5	5.3	7.8	7.5

continued

Table 2 continued

	New Zealand		Californian	
	Cassava	Corn	Cassava	Corn
Economics				
Feed consumed (kg)	78.8	46.0	61.0	64.7
Cost of feed (francs CFA)	6304	4646	4880	6535
Body weight (kg)	0.80	0.96	0.82	0.90
Revenue (francs CFA)	49600	84480	54120	75600
Feed cost/kg weight gain	10168	10804	8793	14522

the New Zealand White is a better meat producer.

The long fibre from the *S. guyanensis* (stylo) probably enabled better utilization of the soluble cassava carbohydrates and avoided the accumulation of cecal toxins (Aitken and Wilson 1962).

The similarity for reproductive, growth, and carcass traits of the rabbits on both diets suggests that, at the levels in this study, the cyanide did not affect the rabbits or that it was rapidly detoxified by rhodanese of the liver. Rabbit liver contained 8–9 mg rhodanese/g. The value is surpassed only by the rhodanese content of rat liver, 14–28 mg/g. It is also probable that the stylo was efficient as a protein source for the support of growth and also for the supply of additional sulfur for the elimination of cyanide as thiocyanate. The utilization of stylo reduced

feed cost as it replaced fish meal in the cassava diets.

The similarity in thyroid weights of the rabbits on both diets suggests that the levels of thiocyanate were below the threshold causing goitre (Oke 1973). The economic data (Table 2) show that a small farmer can produce meat for his or her table and also make money by using cassava as an energy source for rabbits. The potential, therefore, for raising rabbits for meat in the humid tropics is good, for these animals convert feed into meat more efficiently than do many other types of domestic livestock.

This work was part of a thesis submitted to the Department of Animal Science, University of Ife, as partial fulfillment of a Ph.D. degree in animal science and was supported by the International Development Research Centre, Canada.