



WEIGHT GAIN AND DRESSING PERCENTAGE OF RABBITS  
FEEDING DIFFERENT LEVELS OF NACEDERO  
(*Trichanthera gigantea*)

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Abstract  
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*How to cite this paper*

*Brenès-Stoto A., 2013. Weight gain and dressing percentage of rabbits feeding different levels of nacedero (*Trichanthera gigantea*) (abstract). 3rd Conference of the Asian Rabbit Production Association, 27-29 August 2013, Bali, Indonesia, 263 + poster*

## Weight Gain and Dressing Percentage of Rabbits Feeding Different Levels of Nacedero (*Trichanthera gigantea*)

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### ABSTRACT

Production performance, including weight gain and dressing percentage, of rabbits fed with different levels of Nacedero (*Trichanthera gigantea*) were evaluated. The experiment was conducted in a commercial farm located in San Ramon, Alajuela. Thirty weanling animals (California breed) were used, randomly distributed among three treatments: T1: Control: 100% commercial extruded diet, T2: 85% concentrate and 15% Nacedero fresh leaves, T3: 70% concentrate and 30% Nacedero fresh leaves. Animals were individually weighed weekly for 8 weeks, then slaughtered at 88 days of age and dressing percentage calculated. Significant differences ( $p < 0.05$ ) were found between animals from treatments 1 and 2 compared to treatment 3 (Tukey test). Treatment 3 showed the lowest final weight ( $p = 0.003$ ), weight gain ( $p = 0.008$ ) and dressing percentage ( $p = 0.002$ ). Animals initial weights had an important effect in all parameter responses ( $p = 0.02$ ). Average initial weights were 441, 403 and 418 g; weight gain was 19, 19 and 17 g/animal/day and dressing percentage was 55, 54 and 51% for animals from treatments 1, 2 and 3, respectively. Food intake was significantly less in animals from treatments 1 and 2 compared to control ( $p < 0.05$ ). It is suggested that a 15% of inclusion of fresh Nacedero foliage in diets for fattening rabbits did not affect productive performance; inclusion of up to 30% decreased productivity. Responses using dry and ground Nacedero must be evaluated further.

**Key Words:** Food Intake, Nutrition, Weight Gain, *Orytolagus cuniculus*, *Trichanthera gigantea*





# Introduction

Rabbit production is an economically viable alternative in Costa Rica. Rabbit meat is a good source of high quality protein, which allows income generation with relatively low investment compared to other livestock species, due to its reproductive efficiency, short pregnancy period and large litter size.

There are many species of tropical browse forages used in herbivores' diets, which represent a good source of protein for these animals in the tropics. Nacedero (*Trichanthera gigantea*) has been used as a forage with excellent responses in monogastric species (rabbits, guinea pigs, swine) as well as in ruminants like sheep and goats.

According to its feeding strategy, rabbits are classified as hindgut concentrate selectors. Although they can use the cecum and the colon as fermentation chambers, the majority of the microbial activity is located in the cecum. Thus, these animals need high fiber diets to regulate the passage rate as well as to provide a good digestive health.

The use of tropical forages is an option for feeding rabbits in production systems, that allows farmers from rural areas to make the most of their potential, without affecting the productive performance, maintain/obtain animals at lower cost, and not depend totally on concentrates or commercial diets.

The goal of this study was to evaluate the productive responses of rabbits feeding on different levels of nacedero, through measures of weight gain and dressing percentage.



# Objectives

- 1) Analyze the animal response, in terms of productive performance, using different diets for fattening rabbits.
- 2) Determine the optimal level of inclusion of a fiber source in diets for rabbits.
- 3) Evaluate the potential of nacedero (*Trichanthera gigantea*) as a source of important nutrients for rabbit nutrition.





## Materials & Methods

The study was held on a commercial farm, located in Alajuela, in the north-central part of the country, 1120 meters above sea level with temperatures between 15.2-28.3°C, 82% relative humidity and 2453 mm of annual precipitation.

Thirty weanling rabbits (California breed) were obtained and maintained in individual cages (30 X 30 cm), and then randomly distributed among three treatments (10 animals per treatment):

- T1: Control. 100% commercial extruded diet (concentrate).
- T2: 85:15. 85% concentrate and 15% nacedero fresh leaves.
- T3: 70:30. 70% concentrate and 30% nacedero fresh leaves.

Food intake was recorded and animals were weighed once a week for 8 weeks, using a scale TSCALE 25 g ( $\pm 1$  g). Concentrate as well as nacedero leaf samples were taken for nutritional analysis at the Animal Nutrition Research Center and Agricultural Research Center (San Jose, Costa Rica). Analysis included dry matter, crude protein, fat, neutral detergent fiber (NDF) and acid detergent fiber (ADF), as well as minerals.

Animals were slaughtered at 88 days of age, and dressing percentage was calculated.

Statistical comparisons were expressed as the means and differences using Tukey Test, and were considered significant at  $p < 0.05$  using ANOVA and ANCOVA analysis. All statistical analyses were performed using the STATISTICA 6.0 software package.





# Results

## Diets

Food intake in the first week was 40 g/day, during the second week 70 g/day, then stabilized at 100 g/animal/day of fresh matter. Table 1 shows nutrient composition of diets.

Table 1. Nutritional composition of diets from each treatment compared to rabbit requirements.

Treatment	%DM	%CP	%EE	%Ca	%P	%NDF	%ADF
T1	89,80	17,55	3,20	0,67	0,73	42,63	23,80
T2	78,87	17,73	3,17	0,78	0,72	42,59	23,96
T3	87,14	17,98	3,12	0,83	0,71	42,53	24,17
Nutritional requirements*	-	15-17	2,0-4,0	0,7-0,8	0,45	32-35	16-18

\*Fattening rabbits, according to Carabaño et al. (1997), CEDAF (1998) and Roca (2004).

Calcium levels increased with the use of nacedero, covering rabbits' needs. Likewise, protein and fiber levels in diets are appropriate to support a normal digestive function and good growth. Table 2 shows the nutrient intake in each treatment.

Table 2. Nutrient food intake with the different treatments (grams of dry matter).

Treatment	DM	CP	EE	NDF	ADF	Ca	P	Ca:P ratio
1	99,66	17,49 <sup>a</sup>	3,19	42,49	23,72	0,67 <sup>a</sup>	0,73 <sup>a</sup>	0,7:1
2	86,76	15,38 <sup>b</sup>	3,17	36,95	20,79	0,68 <sup>b</sup>	0,62 <sup>b</sup>	1,1:1
3	73,85	13,27 <sup>c</sup>	2,30	31,41	17,85	0,69 <sup>c</sup>	0,52 <sup>c</sup>	1,3:1

DM: dry matter, CP: crude protein, EE: ether extract, NDF: neutral detergent fiber, ADF: acid detergent fiber, Ca: calcium, P: phosphorus.

Nutrient intake decreased significantly ( $p < 0.05$ ) with the inclusion of nacedero fresh leaves in treatments 2 and 3 compared to Control. The important changes were in protein, calcium and phosphorus intake. A lower intake could affect the normal growth of the animals; 30% of nacedero leaves could compromise the rabbits' development.



# Results

## Animal Responses

Figure 1 and 2 show growth and weight of the rabbits

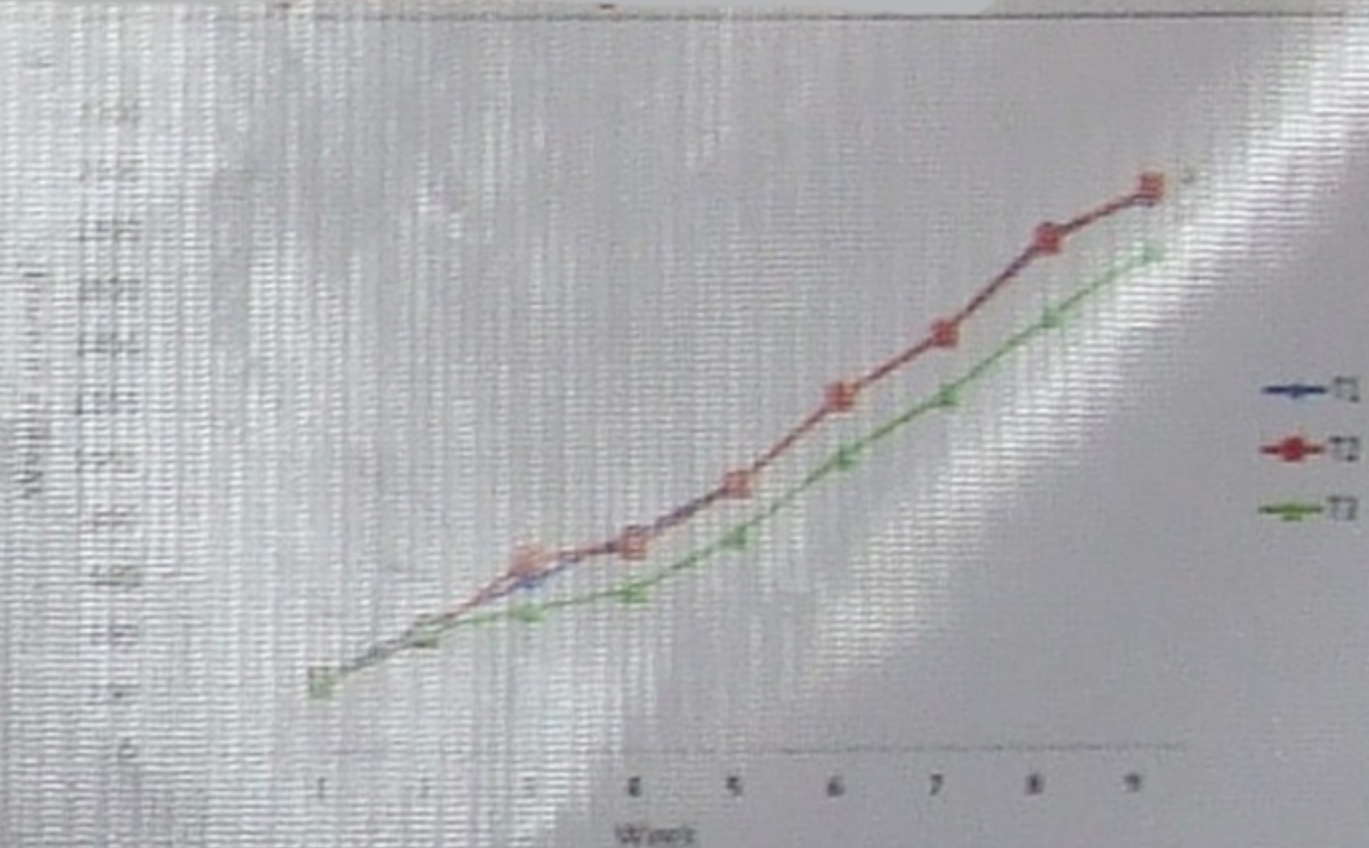


Fig. 1. Growth of rabbits fed with different levels of nacedero. T1: 100% concentrate, T2: 85% concentrate 15% nacedero, T3: 70% concentrate 30% nacedero.

Animals from T3 demonstrated lower weights during the study ( $p < 0.05$ ). Conversely, 15% of leaves didn't affect this parameter.

Average Initial animals' weights were T1: 441 g, T2: 403 g and T3: 418 g. Analysis of covariance determined that this parameter had a significant effect in the responses ( $p = 0.02$ ). Additionally, animals fed with 30 % nacedero showed lower final weight ( $p = 0.003$ ).

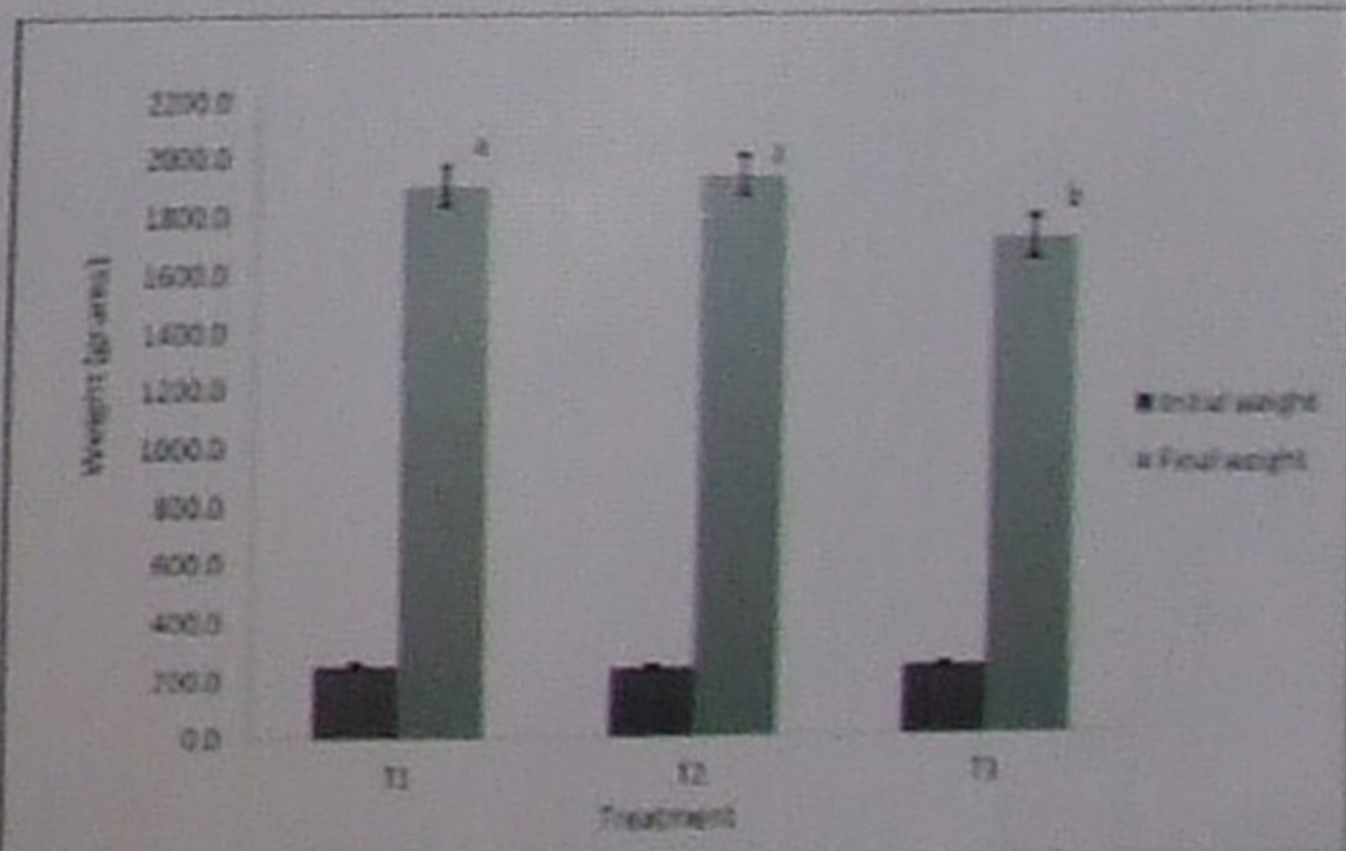


Fig. 2. Initial and final weights of rabbits fed with different levels of nacedero.



Weight gain (rate) also was affected by the inclusion of 30 % nacedero ( $p=0.008$ ). Data obtained was 19 g/day for treatments 1 and 2, and 17 g/day for treatment 3. Values are similar to those obtained using leucaena (*Leucaena leucocephala*) and better to those using pinto peanut (*Arachis pintoi*), although values for all dietary treatments are lower than commercial recommendations of 20-30 g/day.

Table 3 shows dressing percentage data.

Table 3. Dressing percentage of rabbits fed with three diets

Treatment	Dressing percentage (%)
T1: 100% C	55.0±2.0 <sup>a</sup>
Minimum	50.5
Maximum	58.8
T2: 85% C: 15% N	54.0±1.7 <sup>a</sup>
Minimum	52.1
Maximum	58.6
T3: 70% C: 30% N	51.0±1.2 <sup>b</sup>
Minimum	49.8
Maximum	53.3

Results from treatments 1 and 2 are according to the recommendations for fattening rabbits (54-64%), which indicates that a 15% of nacedero doesn't affect this parameter.

However, 30% of nacedero inclusion in diets did significantly and negatively affect the dressing percentage ( $p=0.002$ ).

C: concentrate, N: fresh leaves of nacedero. Values with different letter differ statistically, according to Tukey Test ( $p \leq 0.05$ ).

## Conclusions

*Trichanthera gigantea* is a good source of fiber, protein and calcium, and is included as dietary supplement in diets for a wide variety of animals. According to the results obtained in this study, it is suggested that inclusion of 15% of the forage for fattening rabbits is suitable. Inclusion of up to 30% of nacedero could decrease productivity of the animals. Responses using dry and ground nacedero must be evaluated further.

## References