GROWTH TRAITS AND DRESSING PERCENTAGE OF STRAIGHTBRED AND CROSSBRED RABBITS

BIANOSPINO E., WECHSLER F. S., MOURA A.S.A.M.T., FERNANDES S.

Departamento de Produção e Exploração Animal, Faculdade de Medicina Veterinária e Zootecnia, UNESP, Botucatu, SP, 18618-000
anamoura@fca.unesp.br

ABSTRACT

The objective was to evaluate the effects of genetic group (straightbred *vs* crossbred) and age on growth and dressing percentage of rabbits. A total of 128 straightbred Botucatu and Botucatu x White German Giant crossbred rabbits, males and females, were involved in the study. Young rabbits were weaned at 35 days and sequentially slaughtered, four per genetic group x sex combination, at: 42, 49, 56, 63, 70, 77, 84 and 91 days of age. Body weight, average daily feed consumption, pre-slaughter weight, hot carcass weight, weights of skin, distal parts of fore and hind legs, and of empty gastrointestinal tract were recorded. A 2 X 2 factorial arrangement was employed in a completely randomized design with repeated measures. Crossbred rabbits were heavier and consumed more feed than straightbred ones throughout the experiment (2032 *vs* 1962 g and 143.5 *vs* 131.0 g/d, respectively). No difference between genetic groups was detected for average daily gain corrected for feed consumption, suggesting that feed efficiency was similar between groups. There was a genetic group x age interaction for dressing percentage; crossbreds showed higher yield at 70 days of age, but the difference was not maintained after 84 days of age. A genetic group x sex x age interaction was detected for weight of distal parts of legs. Crossbreds showed heavier skins (314 *vs* 293 g), distal parts of legs (76.6 *vs* 70.4 g) and empty gastrointestinal tracts (178 *vs* 171 g). When these weights were corrected for live weight at slaughter, only the weight of distal parts of legs remained higher for crossbreds (176 *vs* 173 g). Age, as expected, affected all traits. With the exception of the empty gastrointestinal tract being heavier in females (178 *vs* 171 g), no other gender differences were found. Crossbreeding may be recommended for the production of light carcasses. Weights of retail cuts, fatness and meat quality should be evaluated for the production of heavier carcasses.

Key words: rabbit, growth, feed consumption, dressing percentage.

INTRODUCTION

Carcass quality should meet economic objectives, such as high yield. The main rabbit carcass traits are: carcass weight, which may range from 1.0 to 1.8 kg, dressing percentage, from 55 to 61% (OUHAYOUN, 1989, DALLE ZOTTE and OUHAYOUN, 1998), and proportion of commercial parts (foreleg and thoracic cage, loin and hind leg).

Non-edible by-products, such as the gastrointestinal tract, distal parts of fore and hind legs, and even the skin, are considered as losses by the meat industry. Skin and adipose tissue show progressive increase in their allometric coefficient, whereas gastrointestinal tract and bone tissue show decreasing allometric coefficients as age progresses (OUHAYOUN, 1983).

The production of commercial carcasses in a short time and the improvement of feed efficiency and dressing percentage are the most important criteria to optimize rabbit meat production costs. Crossbreeding programs involving specialized rabbit breeds or strains have been adopted to meet these objectives.

Selection for post-weaning growth rate has been one of the main focuses of breeding programs (MOURA *et al.*, 1997; PILES and BLASCO, 2003). Feed efficiency has been indirectly improved, but dressing percentage and meat quality have been decreased, if the animals are slaughtered at the same weight at an earlier age (PLA *et al.*, 1996, 1998). Thus, it becomes necessary to determine, for each genetic group, the optimum slaughter age.

The objective was to evaluate the effects of genetic group (straightbred *vs* crossbred) and age on growth performance and dressing percentage of rabbits.

MATERIAL AND METHODS

The experiment was carried out at the Rabbit Production Unit of *Faculdade de Medicina Veterinária e Zootecnia,* UNESP, Botucatu, SP, Brazil, from March through May, 2003.

Initially, 144 weaned rabbits, males and females, were caged in flat deck wire cages, fitted with nipple drinkers and feeders. Cages were housed in an open, east-west oriented building protected with plastic adjustable curtains. Rabbits were randomly assigned to treatments, nine per cage, according to genetic group and gender, at weaning (35 days of age).

Only 128 animals were, in fact, used in the experiment; the remaining 16 (one per cage) were included with the objective of replacing possible mortality losses. Half of the rabbits were from the Botucatu strain and half were products of crossbreeding between Botucatu females and White German Giant males from a commercial producer. The Botucatu genetic group is a synthetic strain, originated from Norfolk 2000 rabbits (MOURA *et al.,* 2000). The German Giant breed is heavier and assumed to be later maturing than the Botucatu strain.

Animals had free access to feed and water. A pelleted feed was formulated according to DE BLAS and MATEOS (1998) and produced on campus. Average feed consumption was recorded weekly on a cage basis.

At 42, 49, 56, 63, 70, 77, 84, 91 days of age all rabbits were weighed; one was randomly taken from each cage (four per treatment) for slaughter. Slaughter took place at the

Experimental Chicken Slaughter House on campus. A neck hit was followed by jugular vein bleeding. Weights of hot commercial carcass (carcass including head, thoracic viscera – heart, lungs, oesophagus, trachea and thymus –, liver and kidneys), skin, distal parts of fore and hind legs, and empty gastrointestinal tract were recorded (BLASCO and OUHAYOUN, 1996).

A 2 x 2 factorial arrangement (genetic groups x genders) was employed in a completely randomized design with repeated measures, where the factorial was applied to the main plots (cages) and the repeated measures consisted of the weighings. Growth performance traits were: body weight, slaughter weight, feed consumption, and average daily gain corrected for feed intake. Yield traits were dressing percentage, skin weight, distal parts of fore and hind legs weight, and empty gastrointestinal weight. Two analyses of growth and yield traits, except for dressing percentage, were performed - uncorrected and corrected for slaughter weight - by means of the MIXED procedure of SAS (1996).

RESULTS AND DISCUSSION

Average body weight and feed consumption throughout the experiment were larger for crossbred rabbits, as compared to straightbreds (Table 1). No differences in average daily gain corrected for feed consumption were detected, indicating that feed conversion was similar for both genetic groups. Consistently, slaughter weight was also higher for crossbreds. A genetic group x age interaction was found for dressing percentage ($P<0.05$, Figure 1). There was also a trend for dressing percentage to be higher in crossbreds. These results are in agreement with those of OZIMBA and LUKEFAHR (1991). Working with New Zealand White and Californian straightbreds and several different crossbreds, they found purebreds to be lighter for slaughter and carcass weights.

Table 1. Least-squares means of growth performance and slaughter traits, not adjusted and adjusted for slaughter weight, according to genetic group

Trait	Not adjusted			Adjusted		
	Straight Bred	Crossbred	Prob.	Straight bred	Crossbred	Prob.
Body weight (g)	1962	2032	0.0026			
Feed consumption (g)	131.0	143.5	0.0018			
Average daily gain (g/d)[A]	35.1	35.4	0.8316			
Slaughter weight (g)	2093	2169	0.0171			
Dressing percentage	58.3	59.0	0.0684			
Skin (g)	293.1	314.3	0.0017	299.7	308.2	0.0610
Distal part of legs (g)	70.4	76.6	0.0001	71.4	75.7	0.0001
Empty gastrointestinal tract weight (g)	170.9	178.1	0.0170	173.2	175.9	0.3113

[A]Corrected for feed consumption

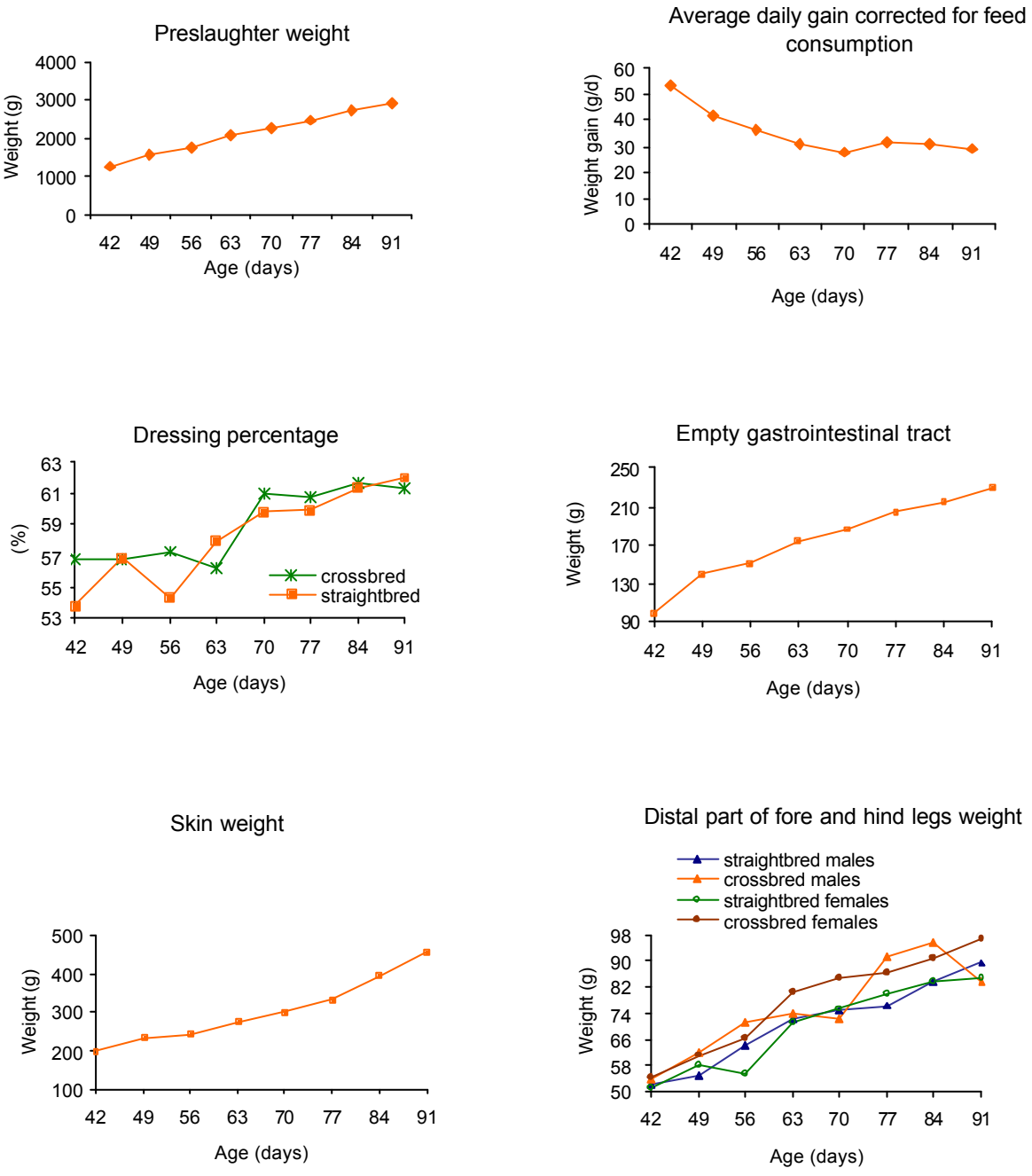

Figure 1. Effect of age on growth and dressing percentage. Curves were drawn according to significant interactions in the statistical analyses: four curves for a genetic group x sex x age interaction, two curves for genetic group x age interaction and one curve for no interaction

There was a genetic group x gender x age interaction for distal parts of fore and hind legs weight (Figure 1). Skin, distal part of fore and hind legs (Table 1, non adjusted data), and empty gastrointestinal tract were heavier in crossbred rabbits, but when these weights were adjusted for slaughter weight, differences between groups became non significant, except for the weight of the distal parts of fore and hind legs, suggesting that these were, in fact, proportionately heavier in crossbreds.

There was a positive relationship between age and each trait ($P<0.001$, Figure 1), except for average daily gain corrected for feed consumption. For this trait, as expected, the relationship was negative. Age means for slaughter weight ranged from 1274 to 2929 g between 42 and 91 days of age; the minimum commercial liveweight of 2 kg was attained at 63 days of age (for both genetic groups). Age means for dressing percentage ranged from 53.7 to 61.4% for straightbreds and 53.8 and 62.1% for crossbreds, from 42 to 91 days of age. A more pronounced increase in dressing percentage seemed to have occurred between 63 and 70 days of age, for both genetic groups. The dressing percentage of Pannon White rabbits weighing from 2.2 to 3.5 kg ranged between 59.5 and 62.1% (SZENDRÖ *et al*., 1998), values that are compatible with those found in the present study. According to DALLE ZOTTE and OUHAYOUN (1998) dressing percentage increases up to 91 days of age.

Empty gastrointestinal tract weight, not adjusted and also adjusted for slaughter weight, was larger for females (178 *vs* 171 g, $P<0.05$ and 178 *vs* 171 g, $P<0.05$, respectively). A trend for females to be heavier throughout the experiment than males was also observed (2016 *vs* 1977, $P = 0.0598$). Differences between males and females were not detected for any other traits.

Crossbreeding may be recommended for the production of light carcasses. Weights of retail cuts, fatness and meat quality should be evaluated for the production of heavier carcasses.

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