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COMMUNICATION

Influence of the genetic origin and sex on live performance and carcass traits in the rabbit. Preliminary results

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ABSTRACT

The study compared the growth performance and carcass traits of 41 rabbits of both sexes derived from 3 genetic origins (GO): sire Vienna Blue (B), sire Burgundy Fawn (F) and hybrid rabbits (H). From weaning they were reared indoor in bicellular cages and fed *ad libitum* the same pelleted diet until a fixed slaughter weight (2.8 ± 0.11 kg). The rabbits of the 3 GO differed in slaughter age (88 vs 109 vs 122d for H, B and F-GO, respectively; $P < 0.001$). Growth performance of B was better than that of F, while that of H was better than B+F groups. Carcass traits were not modified by the GO; only perirenal fat percentage increased from H (1.2%) to B (1.7%) to F (2.5% of the reference carcass; $P < 0.05$) accordingly to the slaughter age. The sex effect was significant only for the dressing out percentage, being higher in males than females (59.0 vs 57.6%; $P < 0.05$).

Key words: Rabbit, Genetic origin, Sex, Carcass composition

Introduction

Intensive rabbit meat production is based on hybrid rabbits, extracted from a few breeds and strongly selected for production traits. The hybrid rabbits are nowadays showing poor resistance to some diseases, which increases the use of chemicals. On the other hand, the current consumer is now looking for safer meats, obtained with the respect of the animal welfare and with good nutritional and organoleptic qualities. For these main reasons, the necessity for the utilization of rabbit breeds, purebred or their crosses, showing a good resistance to diseases is emerging, with the aim to reduce or stop the use of chemicals for the benefit of the consumer. In order to fit the farmer and the slaughterhouse needs, growth and feed efficiency together with carcass yield of the rabbits must be

profitable. Among the adoptable breeds, Vienna Blue and Burgundy Fawn seem to be the more profitable to be introduced for this purpose. The aim of this study was to compare the live performance and the carcass yield of rabbits derived from 2 sire genetic origins, Vienna Blue and Burgundy Fawn, with the commercial hybrid rabbit (H group).

Material and methods

Forty-five weaned rabbits of both sexes were used. Fifteen of them were hybrid rabbits (H genetic origin - GO), 15 derived from Vienna Blue (B) and 15 from Burgundy Fawn (F) sire GO. The maternal genetic origin of B and F rabbits was a mixture of crosses of several medium-large size breeds, California and New Zealand White exclud-

Table 1. Growth performance of rabbits.

		Genetic Origin (GO)			Sex (S)		P-value			RMSE
		B	F	H	Female	Male	GO	S	GOxS	
N. rabbits		14	15	12	17	24				
Weaning age ⁽¹⁾	d	39	42	38	40	40				
Slaughter age	"	109 ^b	122 ^c	88 ^a	106	107	***	ns	ns	9
Weaning weight	g	816 ^a	790 ^a	1079 ^b	906	884	***	ns	ns	75
Final weight	"	2792	2737	2863	2810	2785	ns	ns	ns	113
ADG ⁽²⁾	g/d	29.1 ^b	24.4 ^a	37.2 ^c	30.1	30.4	***	ns	ns	3.5
Feed intake	"	152 ^b	153 ^b	140 ^a	148	149	**	ns	*	9
FCI ⁽³⁾		4.28 ^a	5.02 ^b	3.90 ^a	4.41	4.39	**	ns	ns	0.58

⁽¹⁾Covariate; ⁽²⁾Average daily gain; ⁽³⁾Feed conversion index; *: $P < 0.05$; ** or a, b: $P < 0.01$; *** or a, b, c: $P < 0.001$; GOxS interaction for feed intake, g/d: B= female 157.8, male 146.8 g/d ($P < 0.05$); F=female 147.2, male 158.6 g/d ($P < 0.05$); H=female 139.2 and male 141.2 g/d (ns).

ed. All the animals were weaned at 40 ± 4 d and housed by pairs in cages in the same fattening rabbitry. A commercial pelleted diet was given *ad libitum*. Feed intake was recorded weekly. The animals were weighted at weaning and every week after the 11th week of age in order to find the prefixed slaughter weight of 2.8 kg.

Twelve H, 14 B and 15 F were then slaughtered at 2.8 ± 0.11 kg and at 88, 109 and 122 d of age, respectively. One B rabbit was excluded due to too light weight whereas 3 H rabbits because of they exceeded the prefixed slaughter weight. The chilled carcasses (CC) and the reference carcasses (RC = CC minus head, liver, kidneys, organs of chest and neck) were prepared as recommended by Blasco & Ouhayoun (1996). From the RC carcasses the perirenal fat and the other dissectible fat, the hind legs and the loin joint (1st–7th lumbar vertebra) were removed, weighed and expressed as %RC. One uncooked hind leg was furthermore dissected and its meat/bone ratio was calculated. ANOVA was performed using the proc GLM of the SAS (1990) program, by including the GO (H, B, F), the sex (S) and the GOxS interaction as fixed effects. LS means were calculated for all the effects involved in the model and the t test between means was calculated.

Results and conclusions

Table 1 summarises the effects of the GO

(Vienna Blue: B; Burgundy Fawn: F; hybrid: H) and the sex (S) on the post-weaning growth. Although B and F rabbits were weaned at an elder age than the H rabbits, they were significantly lighter (816, 790 and 1079g, respectively; $P < 0.001$). Subsequently, at the fixed slaughter weight of 2.8 ± 0.11 kg, the rabbits of the 3 GO significantly differed in the slaughter age (88 vs 109 vs 122 d for H, B and F GO, respectively; $P < 0.001$), indicating that B and F crossbred rabbits are less precocious and have lower growth performance than hybrid rabbits. Slaughter age, average daily gain, and feed conversion index of B-GO were better than those of F-GO ($P < 0.01$). These results partly confirm those reported by Jensen and Tuxen (1982) referred on pure bred Vienna Blue and Burgundy Fawn rabbits. The growth performance were not influenced by the sex. The feed intake showed a GOxS interaction: in the rabbits of B-GO the feed intake of females were higher than that of males (157.8 vs 146.8 g/d; $P < 0.05$) while in rabbits of F-GO the feed intake was reversed (147.2 vs 158.6 g/d; $P < 0.05$); in the H-GO the feed intake was comparable. The effects of the GO and the S on the slaughter performance of rabbits are listed in Table 2. Carcass traits and slaughter yield were not significantly modified by the GO of the rabbits; only the perirenal fat percentage significantly ($P < 0.05$) increased from 1.2% (H-GO) to 1.7% (B-GO) to 2.5% RC (F-GO) accordingly to the slaughter age. The 2 crossbred group of rabbits tended to

Table 2. Slaughter yield.

		Genetic Origin (GO)			Sex (S)		P-value			RMSE
		B	F	H	Female	Male	GO	S	GOxS	
N. rabbits		14	15	12	17	24				
Slaughter weight (SW)	g	2782	2705	2910	2812	2786	ns	ns	ns	111
Full digestive tract	% SW	16.6	17.7	18.7	18.3	17.1	ns	ns	ns	2.2
Skin and pawns	"	16.9	16.4	16.7	16.5	16.8	ns	ns	*	1.0
Cold dressing out	%	59.4	58.9	56.7	57.6	59.0	ns	*	ns	1.9
RC ⁽¹⁾	% CC ⁽²⁾	81.6	81.4	82.2	81.8	81.7	ns	ns	ns	1.5
Perirenal fat	% RC	1.7 ^a	2.5 ^b	1.2 ^a	1.8	1.8	*	ns	ns	0.6
Total dissectible fat	"	2.6	3.6	2.5	2.9	2.9	ns	ns	ns	0.9
Hind legs	"	34.2	33.1	34.2	33.6	34.0	ns	ns	ns	1.0
Loin joint ⁽³⁾	"	26.5 ^β	26.9 ^β	24.3 ^α	25.9	25.8	0.06	ns	ns	1.5
Hind leg meat/bone ratio ⁽⁴⁾	"	5.1	5.0	5.3	5.1	5.1	ns	ns	ns	0.6

⁽¹⁾Reference carcass; ⁽²⁾Chilled Carcass; ⁽³⁾1st-7th lumbar vertebra; ⁽⁴⁾ determined on uncooked hindleg; α, β : $P < 0.1$; * or a, b: $P < 0.05$; GOxS interaction for skin%SW: B= female 16.2%, male 17.6% ($P < 0.05$); F= female 16.1%, male 16.7% (ns); H= female 17.2%, male 16.1% (ns).

have an higher loin incidence than the hybrid group (26.5 vs 26.9 vs 24.3%RC, for B, F and H-GO, respectively; $P < 0.10$). Contrarily to what found by Paci *et al.* (1995), the rabbits derived from Burgundy Fawn sire GO of the present work evidenced lower growth rate and worse feed conversion index. The sex effect was significant only for the dressing out percentage, resulted higher in males than in females (59.0 vs 57.6%; $P < 0.05$). Also Paci *et al.*, (1995) observed that males belonging to Burgundy Fawn sire GO had higher dressing out percentages than females due to the significantly lower incidence of full digestive tract, as observed to a less extent (ns) in the present work. A GOxS interaction effect was observed on skin and pawn incidence: on B-GO the difference was significant (16.2%SW for females and 17.6%SW for males; $P < 0.05$) whereas on the other 2 GO any sex-related difference was observed.

In conclusion, the live performance and the carcass quality of B-GO (sire Vienna Blue) are quite comparable to those obtained from the H-GO (hybrid). The animals of B-GO were 3 weeks elder than H rabbits, so, the extra cost due to the longer fattening period should be counterbalanced by the improvement of their meat quality. The meat quality traits are under evaluation.

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