

FEED EFFICIENCY AND POSTWEANING GROWTH OF SEVERAL SPANISH SELECTED LINES

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Abstract - A comparison of weight at 63 days, growth rate and feed efficiency has been carried out along three seasons on four selected lines (two dam lines selected for litter size at weaning and two sire lines, currently selected for postweaning daily gain).

Sire lines (Line R (2598 g) and Line C (2251)) were heavier than dam lines at 63 days (Line V (2116 g) and Line P (2086 g)). The growth rate was also higher on the lines selected for (Line R (52.0 g/d) and Line C (45.6 g/d)) than on the lines selected for reproductive traits (Line P (41.4 g/d) and Line V (41.0 g/d)).

Postweaning feed efficiency of Line R (2.71) was the best. However, no differences were found between Lines V (2.84) and C (2.91). Line P had the largest value (3.15).

INTRODUCTION

In rabbit, studies on growth and feed efficiency of different breeds and their crosses are usually reported (GROBNER *et al.*, 1985 ; CHIERICATO and FILOTTO, 1989 ; OZIMBA and LUKEFAHR, 1992). Several works have been published recently focused on the comparison between rabbit strains selected on different objectives. Growth and feed efficiency have been studied on maternal lines and on specialised sire lines (TORRES *et al.*, 1992; FEKI *et al.*, 1996).

IRTA is breeding at this moment two rabbit strains. Line C was selected for a global objective, litter weight at 60 days (RAFEL *et al.*, 1990). Males from this origin are used as terminal sires in three way crosses. The reproductive behaviour is satisfactory (UTRILLAS *et al.*, 1989 ; UTRILLAS *et al.*, 1992). Last year (1994), the average litter size at birth was 9.1, and the litter size at weaning was 7.3 young rabbits. Second strain, line P, is selected on litter size at weaning (GOMEZ *et al.*, 1996).

This work studies these two lines, together with line V and line R, coming from the Animal Science Department of Polytechnic University in Valencia. Comparisons are made for the traits: weight at 63 days, postweaning daily gain and feed efficiency.

MATERIAL AND METHODS

Four rabbit strains are considered. Two of them are selected on litter size at weaning: Line V (ESTANY *et al.*, 1989) and line P (GOMEZ *et al.*, 1996). Line R is selected on growth rate between weaning and slaughter age (63 days) (ESTANY *et al.*, 1992). Finally, line C has been selected for a global objective (RAFEL *et al.*, 1988 ; RAFEL *et al.*, 1990) until March 1993, and now is only selected on growth rate

Table 1 : Number of rabbits dead during the fattening period by line and season

Line	P	R	V	C
Spring	6	8	1	5
Summer	1	1	2	1
Winter	0	3	2	0

The experiment was carried out at three seasons (spring and summer 1993 and winter 1994). Animals were housed in an Experimental Farm in Prat de Llobregat. Forty animals from each line were considered on every season. The fattening period lasted five weeks, after weaning (28-31 days). Collective cages with eight

animals were used. Animals were weighed weekly and the food intake was also recorded. Commercial pelleted food was supplied ad libitum (15.5% protein, 4% fat and 14.7% fibre). Number of rabbits dead is shown in Table 1.

Data were analysed with SAS (SAS, 1988) using the GLM procedure. Model took into account line and season as main effects, and their interaction.

RESULTS AND DISCUSSION

Table 2 : Least squares means (LSM) of Lines for weight at 63 days, growth rate and feed efficiency (and the maximum standard errors (s.e.))

	Line	P	R	V	C	s.e.
Weight at 63 days (g)		2086 a	2598 c	2116 a	2251 b	20
Growth rate (g/d)		41.4 a	52.0 c	41.0 a	45.6 b	0.39
Feed efficiency		3.15 c	2.71 a	2.84 b	2.91 b	0.036

Row LSM with no letters in common differ significantly ($P < 0.05$)

Table 3 : Least squares means (LSM) of Seasons for weight at 63 days, growth rate and feed efficiency (and the maximum standard errors (s.e.))

	Season	Spring	Summer	Winter	s.e.
Weight at 63 days (g)		2298 b	2134 a	2356 c	17.0
Growth rate (g/d)		45.64 b	41.62 a	47.72 c	0.34
Feed efficiency		2.93 b	2.70 a	3.08 c	0.031

Row LSM with no letters in common differ significantly ($P < 0.05$)

more pronounced on line C and line V, with 10% weight losses (see Table 3).

Patterns on growth rate were similar. Significant differences appeared between lines. Line R was the fast growing (Table 2). Line C was intermediate, and line P and line V grew slowly. TORRES *et al.* (1992) and FEKI *et al.* (1996) also observed the highest growth rate on the specialised sire line. The growth rate was clearly higher in winter (Table 3). Summer had a depressor effect on growth as in BASELGA (1979), OZIMBA and LUKEFAHR (1991) or TORRES *et al.* (1992) due to decreased food intake because of the high temperatures (BATTAGLINI and GRANDI, 1988).

Table 4 : Least squares means of Line Season for growth rate (g/d) (maximum standard error 0.705)

	Line	P	R	V	C
Spring		43.06 b	52.24 d	40.93 a	46.34 c
Summer		38.65 a	48.68 c	37.98 a	41.18 b
Winter		42.45 a	55.03 c	44.05 a	49.33 b

Row LSM with no letters in common differ significantly ($P < 0.05$)

despite its high values of weight at 63 days. Lines with high growth rate presented low feed conversion in OUHAYOUN (1978). However, in this experiment line C had a growth rate higher than line V, but no differences were found on feed efficiency between them. Line P had the worst conversion (Table 2).

Seasonal effects were also significant on feed efficiency as in TORRES *et al.* (1992) or FEKI *et al.* (1996). The highest values were obtained in winter and the lowest ones in summer (Table 3).

Line and season effects were significant when the weight at 63 days was analysed (Table 2). Lines selected on growth rate are significantly heavier than lines selected on reproductive traits. Similar results were founded by TORRES *et al.* (1992) and by FEKI *et al.* (1996). Line R, selected exclusively on growth rate, is the heaviest, and values of line C, selected on litter weight at 60 days, were higher than line V and line P.

Differences between seasons were statistically significant. Weight was lower at the hot season as other authors had reported (BASELGA, 1979; BATTAGLINI and GRANDI, 1988). This effect was

Line-season interaction was significant for growth rate. Lines selected on litter size had different behaviour. In spring and summer, growth of line V was the lowest, but not in winter (Table 4).

Feed efficiency was affected by line effects. Line R had the best results,

CONCLUSION

Line R was the heaviest at 63 days and the postweaning growth rate was the largest. This line had the lowest conversion rate.

Line C had the growth rate and the weight at 63 days lower than line R, but these traits were higher than reproductive lines. However, feed efficiency of line C was not better than line V.

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