Line R

Male Line R

Female Line R

Line R (Spain)

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SUMMARY – A description of the Spanish line R, developed in Valencia (Spain) is carried out. Items that are dealt with are: (i) a general description; (ii) climate and main features of its farming; (iii) performances; and (iv) genetic improvement.

Key words: Line R, rabbits, performance, genetics.

RESUME – "La souche R (Espagne)". Cet article rapporte une description de la souche espagnole R, créée à Valence (Espagne). Les éléments suivants ont fait l'objet d'études : (i) une description générale ; (ii) le climat et les principales caractéristiques d'élevage ; (iii) les performances ; et (iv) l'amélioration génétique.

Mots-clés : Souche R, lapins, performances, génétique.

1. Breed name

(i) *Breed name synonyms:* line R.
(ii) *Strains within breed:* none.

2. General description

2.1. Population data

2.1.1. Population size and census data

(i)   Total number of females being used in purebreeding: 700.
(ii) Total number of females being used in crossbreeding: 0.
(iii) Percent of females being used pure: 100%.
(iv) Total number of males used for breeding: 6000 in crossbreeding. 80 in purebreeding.
(v) Number of males used in AI-service: 500.

Source of data: Unidad de Mejora Genética, Departamento de Ciencia Animal, Universidad Politécnica de Valencia, Spain.

2.1.2. Herd sizes (Table 1)

Table 1. Herd sizes

	Nucleus of selection	Farms producing crossbred does
Mean		
Adult animals	90	20
Young animals	540	120
Range		
Adult animals	80-120	10-150
Young animals	500-720	60-1000

2.1.3. Origin of the breed

Line R comes from the fusion of two paternal lines, one founded in 1976 with California rabbits reared by Valencian farmers and other founded in 1981 with rabbits belonging to specialised paternal lines (Estany *et al.*, 1992). The method of selection has always been individual selection on post-weaning daily gain, weaning taking place at 28 days and the end of the fattening at 63 days. However the main objective of selection is to improve feed efficiency and an important correlated response is expected in this trait because of the high and negative genetic correlation between daily gain and feed conversion. After fusion, the current generation is the 18th.

2.1.4. Situation with regard to danger of extinction

There is no danger, despite the greatest number of males of the line being mated to crossbred females to produce meat rabbits for the slaughterhouse, because there is a conservation programme.

2.1.5. Conservation programme

Every one or two generations of selection a large sample of embryos are frozen. The aim of freezing the embryos is, besides conservation of the line, to have animals available to check the response to selection, because after thawing the embryos it is possible to compare rabbits pertaining to different generations at the same time (Cifre *et al.*, 1999).

2.2. Use of the breed in a descending order of product importance

This line is a specialised paternal line that is usually crossed with crossbred does to produce young for the slaughterhouse.

2.3. Colour

Albino, with fur completely white, the distal parts excepted, that are black.

2.4. General type

2.4.1. Body parts (Table 2)

Table 2. Body measurement (cm) at marketing age (63 d)

Trait	Mean	Range
Body length	32.8	30-35
Chest circumference	28.3	26-30
Loin width	5.2	4.7-5.6
Thigh circumference	13.2	11.5-14.5

2.4.2. Head: convex

2.4.3. Eyes: pink

2.4.4. Ears: erect

2.4.5. Feet and legs: medium in length

2.4.6. Tail: straight

2.5. Basic temperament (for males and females): docile

2.6. Special characteristics of the breed

It has low resistance to sore hocks.

2.7. Nest quality: pooled

3. Pattern

3.1. Climate

3.1.1. Elevation and topography: this line is raised all around Spain

3.1.2. Favourable climate: temperatures between 18-22°C and humidity between 70-75%

3.2. Main features of farming

3.2.1. Socio-management system: intensive

3.2.2. Mating method: natural and AI

3.2.3. Nutrition

(i)   *Concentrates:* pelleted.
(ii) *Water:* freely available.
(iii) *Seasonality of nutrition:* no seasonality.

3.2.4. Housing

(i) *Cages:* wired cages and indoor rabbitry is the most common situation but open air farms with wired cages under an isolated roof are also used.
(ii) *Photoperiod:* both possibilities, light-dark constant photoperiod and variable periods.

3.3. Common diseases and parasites

Pasteurellosis, some intestinal diseases and sore hocks.

4. Performance

4.1. Reproduction (Tables 3, 4 and 5)

Table 3. Information of sexual maturity

Trait	Mean	Range
Age of buck at first service (months)	5	4.5-5.5
Age of doe at first mating (months)	5	4.5-5.5
Age of doe at first kindling (months)	6	5.5-7.5
Weight of buck at first service (g)	4300	3700-4600
Weight of doe at first mating (g)	4570	4100-5000

Table 4. Information of semen

Trait	Mean	Range
Reaction time (seconds)	20	5-40
Ejaculate volume (ml)	0.6	0.2-2
Sperm concentration per ml (10^6)	230	100-300
Sperm motility (%)	70	60-90
Sperm abnormalities (%)	3	1-6

Source: Vicente and Viudes de Castro (1996), Viudes de Castro *et al.* (1998).

Table 5. Fertility and fecundity traits

Trait	Mean	Range
Conception rate (%)	65	45-75
Kindling interval (days)	57	51-64
Ovulation rate	14.5	12-16
Litter size at birth	7.7	4.5-9
Litter size at weaning (28 d)	6.1	4-8
Litter weight at birth (g)	416	–

Source: Cifre *et al.* (1994), Gómez *et al.* (1999a).

4.2. **Prenatal mortality per litter** (Table 6)

Table 6. Prenatal mortality per litter

Trait	Mean	Range
Total (%)	11	7-14
Abortion (%)	0.5	0-1
Stillbirths (%)	10.5	7-14

4.3. **Milk yield traits**

The number of teats has a mean of 8.9 and ranges between 8 and 10.

4.4. **Lifetime production per doe** (Table 7)

Table 7. Lifetime production per doe

Trait	Mean	Range
Number of litters per year	6.4	5.7-7.1
Doe longevity (years)	1.0	0.8-1.2

4.5. Post-weaning body weight, gain and food utilisation (Tables 8 and 9)

Table 8. Post-weaning growth traits of body
weights and gains (g)

Trait	Mean	Range
Weight at weaning (28 d)	600	480-750
Weight at 9 weeks	2280	2100-2420
Daily gain 4-9 weeks	48	44-52

Source: Gómez et al. (1999a).

Table 9. Post weaning food utilisation per young (4-9 weeks)

Trait	Mean	Range
Daily feed intake (g)	134	100-160
Feed conversion (g intake per g gain)	2.8	2.4-3.0

Source: Feki et al. (1996).

4.6. Carcass traits and meat composition (Table 10)

Table 10. Carcass traits and meat
composition

Trait	Mean
Slaughter age (weeks)	8
Slaughter weight (g)	2040
Hot carcass weight (g)	1145
Dorsal length (cm)	25.3
Lumbar circumference (cm)	14.8
Dressing percentage	55.9
Fur weight (g)	293
Moisture (%)	74.6
Protein (%)	20.6
Ether extract (%)	2.9

Source: Gómez et al. (1998), Plá et al. (1996).

5. Genetic improvement

5.1. Genetic parameters

Estimates of genetic parameters of the two lines that were crossed to found the current line R can be found in Baselga et al. (1982, 1992), García et al. (1982) and Camacho (1989). The correlation estimated between growth rate and litter size at weaning was 0.13 in one line and 0.19 in the other. Baselga et al. (1988) studied the h^2 and repeatability of lung injuries as an indicator of genetic resistance to pasteurellosis, the estimates being for h^2, 0.17-0.18 and for the repeatability, 0.53-0.55.

5.2. Selection for economic traits

As explained in the origin of the line, line R is being individually selected for daily gain between 28-63 days. The generation interval is 6 months and the response, estimated by mixed model methodology is around 0.5 g/day per generation (Estany et al., 1992).

5.3. Crossing of breed with other breeds

The males of the line are crossed to crossbred females used in commercial farms, obtaining progeny that save time and food in their fattening. Results comparing lines A, V, R and their crosses for growth and feed efficiency can be found in Gómez *et al.* (1999b).

References

Baselga, M., Blasco, A. and García, F. (1982). Parámetros genéticos de caracteres económicos en poblaciones de conejos. In: *2º Congreso Mundial de Genética Aplicada a la Producción Ganadera*, Vol. 6, Madrid (Spain), 4-8 October 1982, pp. 471-480.

Baselga, M., Deltoro, J., Camacho, J. and Blasco, A. (1988). Genetic analysis of lung injury of four strains of meat rabbits. In: *Proceedings of the 4th World Rabbit Congress,* Vol. 2, Budapest (Hungary), 10-14 October 1988, pp. 120-128.

Baselga, M., Gómez, E., Cifre, P. and Camacho, J. (1992). Genetic diversity of litter size traits between parities in rabbits. *J. Appl. Rabbit Res.*, 15: 198-205.

Camacho, J. (1989). *Estimación de correlaciones genéticas entre caracteres reproductivos y de crecimiento en conejos.* PhD Thesis, Universidad Politécnica de Valencia, Spain.

Cifre, J., Baselga, M., Gómez, E.A. and García, M.L. (1999). Effect of embryo cryopreservation techniques on reproductive and growth traits in rabbits. *Ann. Zootech.*, 48: 15-24.

Cifre, J., Vicente, J.S., Baselga, M. and García-Ximénez, F. (1994). Ovulation rate in lines of rabbits selected on different criteria. *Options Méditerranéennes, Series Cahiers*, 8: 247-252.

Estany, J., Camacho, J., Baselga, M. and Blasco, A. (1992). Selection and genetic response of growth rate in rabbits for meat production. *Genet. Sel. Evol.*, 24: 527-537.

Feki, S., Baselga, M., Blas, E., Cervera, C. and Gómez, E. (1996). Comparison of growth and feed efficiency among rabbits lines selected for different objectives. *Livest. Prod. Sci.*, 45: 87-92.

García, F., Baselga, M., Blasco, A. and Deltoro, J. (1982). Genetical analysis of some reproductive traits in meat rabbit. In: *2º Congreso Mundial de Genética Aplicada a la Producción Ganadera*, Vol. 7, Madrid (Spain), 4-8 October 1982, pp. 575-579.

Gómez, E.A., Baselga, M., Rafel, O., García, M.L. and Ramón, J. (1999a). Selection, diffusion and performance of six Spanish lines of meat rabbit. *Options Méditerranéennes, Series Cahiers*, 41: 147-152.

Gómez, E.A., Baselga, M., Rafel, O. and Ramón, J. (1998). Comparison of carcass characteristics in five strains of meat rabbit selected on different traits. *Livest. Prod. Sci.*, 55: 53-64.

Gómez, E.A., Rafel, O., Ramón, J. and Baselga, M. (1999b). Feeding efficiency in crossbreeding among three of the strains selected in Spain. *Options Mediterranéennes, Series Cahiers*, 41: 153-158.

Plá, M., Hernández, P. and Blasco, A. (1996). Carcass composition and meat characteristics of two rabbit breeds of different degrees of maturity. *Meat Sci.*, 44(1-2): 85-92.

Vicente, J.S. and Viudes de Castro, M.P. (1996). A sucrose-DMSO extender for freezing rabbit semen. *Reprod. Nutr. Dev.*, 36: 485-492.

Viudes de Castro, M.P., Vicente, J.S., Lavara, R. and Lavara, F. (1998). Efficacité de l´insémination artificielle avec un faible nombre de spermatozoïdes dans des systèmes d'élevages commerciaux. In: *7èmes Journées de la Recherche Cunicole*, Lyon (France), 13-14 May 1998, pp. 241-243.