Fattening and slaughter traits of four rabbit genotypes

Ajda Kermauner, Silvester Žgur
Zootechnical Department. University of Ljubljana, Slovenia.

Corresponding author: Vis. pred., mag. Ajda Kermauner. Oddelek za zootehniko. Biotehniška fakulteta. Univerza v Ljubljani. Groblje 3, SI-1230 Domžale, Slovenija – Tel. +386 1 7217881 – Fax: +386 1 7241005 – Email: ajda.kermauner@bfro.uni-lj.si

ABSTRACT

Growth rate of 4 genotypes, two lines of Slovene SIKA meat rabbit (maternal line A and sire line C, both 50 rabbits), hybrid AxC (50 rabbits) and crossbred AxCal (A and Californian, 38 rabbits) was recorded from weaning (35 days of age) to slaughter (93 days). Growth performance and slaughter traits of AxC were different from line A (live weight at 91st day: A 2720, C 3158, AxC 3043 g (P<0.05), heterosis effect (H) +3.38%; carcass weight: A 1490, C 1787, AxC 1716 g (P<0.05), H +5.65%; dressing percentage: A 54.1, C 55.6, AxC 55.5% (P<0.05); H +1.26%. Weaning weight of AxCal was significantly lower than of AxC (AxCal 843, AxC 1050 g, P<0.05), but at the end of the experiment the weight of AxCal rabbits was very close to AxC (AxCal 2958, AxC 3043 g, P>0.05). Other growth and slaughter traits did not differ between AxC and AxCal group.

Key words: Rabbits, Genotypes, Growth, Slaughter traits.

Introduction

In Slovenia, a selection line SIKA for meat production was formed to meet Slovenian needs for breeding rabbits. In conditions of insufficiently developed rabbit market the two-way crossing was established. In Rabbit centre of Biotechnical Faculty, the selection of maternal SIKA line A started in 1988 and the sire SIKA line C in 1995. The genetic factors have high effect on growth rate, proportions of separate digestive organs and carcass quality. Selection on high growth rate can change fattening and slaughter traits (Piles et al., 2000). The production traits of pure SIKA lines are continually recorded from the beginning. The aim of present study was to find out the growth and slaughter traits of hybrid SIKA rabbits (two-way cross between maternal A and sire C line), compared with crossbred between maternal A and Californian rabbits.

Material and methods

Growth rate of 4 different genotypes was recorded from weaning (35 days of age) to slaughter (93±1 days). Genotypes were: two lines of Slovene SIKA meat rabbit (maternal line A and sire line C, both 50 rabbits), hybrid AxC (linecrossing between A and C, 50 rabbits) and crossbred AxCal (between maternal SIKA line A and Californian rabbit, 38 rabbits). Animals were fed a commercial pelleted diet (17% CP, 14% CF) ad libitum; feed intake and weight of rabbits were recorded weekly. Average feed intake, daily weight gain (DWG) and feed conversion ratio (FCR) were calculated in each week and during the entire trial. Slaughter weight, warm carcass weight (without head and distal parts of legs, including liver and kidneys), weight of liver, kidneys and separate digestive organs (with their contents) were measured at slaughter (17 rabbits of line A,
and equal to the weight of maternal line A), but at the end of the experiment the weight of AxCal rabbits was very close to AxC. Rabbits in AxCal group had lighter carcass and heavier stomach than AxC hybrids, while other growth and slaughter traits did not differ between AxC and AxCal groups.

The live weight of AxC hybrids was higher than Italian hybrids (Kermauner and Zgur, 2002) and crossbreds between Pannon White and Danish White rabbits (Szendro et al., 1998), but lower than meat line (Hy+) selected for high growth rate (Dalle Zotte and Ouhayoun, 1998). Crossbreds AxCal were heavier than crossbreds between New Zealand White and Californian (Nofal et al., 1995) and comparable with crossbreds between Pannon White and Danish White rabbits (Szendro et al., 1998).

Because of different dissection procedures it is difficult to compare dressing percentage with other authors: in our experiment it was higher than some results with line C (Kermauner and Zgur, 2002), higher or comparable with maternal lines (Pla et al., 1998) and lower than in lines, selected for high growth (Piles et al., 2000). Proportion of gastro-intestinal tract was lower than in synthetic meat line (Piles et al., 2000) and SIKA sire line C (Kermauner and Zgur, 2002).

Results obtained for Slovene SIKA meat line show moderate heterosis effect in growth performance, but for better expressed linecrossing effect

Table 1. Live weight of rabbits of different genotypes.

| Age (days) | A (LSM ± SE) | C (LSM ± SE) | AxC (LSM ± SE) | AxCal (LSM ± SE) |
|-----------|-------------|-------------|---------------|---------------|
| 36        | 827 ± 11.92 | 1050 ± 12.17| 974 ± 11.92   | 843 ± 13.69   |
| 42        | 1057 ± 21.65| 1284 ± 22.18| 1194 ± 22.73  | 1079 ± 24.37  |
| 49        | 1245 ± 43.31| 1508 ± 41.71| 1371 ± 43.91  | 1291 ± 44.32  |
| 56        | 1330 ± 39.1 | 1591 ± 37.02| 1445 ± 39.71  | 1379 ± 42.32  |
| 63        | 1758 ± 39.8 | 2065 ± 38.23| 1926 ± 41.02  | 1852 ± 43.12  |
| 70        | 2063 ± 36.71| 2384 ± 35.26| 2281 ± 38.44  | 2189 ± 41.62  |
| 77        | 2305 ± 35.93| 2671 ± 35.03| 2577 ± 38.25  | 2460 ± 40.74  |
| 84        | 2521 ± 38.72| 2925 ± 37.75| 2826 ± 41.22  | 2720 ± 43.91  |
| 91        | 2720 ± 41.09| 3158 ± 40.06| 3043 ± 43.75  | 2958 ± 46.59  |

A - SIKA maternal line; C - SIKA sire line; AxC - hybrids between A and C; AxCal - crossbreds between A and Californian breed;

Results and conclusions

During the entire trial, the mortality was very high (average 32.4%) with no significant differences between genotypes. The majority of rabbits died in first 3 weeks of experiment (till 56 days of age). Growth performance and slaughter traits (Table 1 and 2) of AxC hybrids were similar to sire line C and both groups had better results than line A. Most estimates of heterosis (Table 3) indicated that linecrossing between SIKA lines is associated with positive effect on growth performance, except for FCR. Similarly it can be concluded for slaughter traits, especially for carcass weight and dressing percentage.

Weaning weight of crossbred rabbits AxCal was significantly lower than that of AxC hybrids (and equal to the weight of maternal line A), but at the end of the experiment the weight of AxCal rabbits was very close to AxC. Rabbits in AxCal group had lighter carcass and heavier stomach than AxC hybrids, while other growth and slaughter traits did not differ between AxC and AxCal groups.

The live weight of AxC hybrids was higher than Italian hybrids (Kermauner and Zgur, 2002) and crossbreds between Pannon White and Danish White rabbits (Szendro et al., 1998), but lower than meat line (Hy+) selected for high growth rate (Dalle Zotte and Ouhayoun, 1998). Crossbreds AxCal were heavier than crossbreds between New Zealand White and Californian (Nofal et al., 1995) and comparable with crossbreds between Pannon White and Danish White rabbits (Szendro et al., 1998).

Because of different dissection procedures it is difficult to compare dressing percentage with other authors: in our experiment it was higher than some results with line C (Kermauner and Zgur, 2002), higher or comparable with maternal lines (Pla et al., 1998) and lower than in lines, selected for high growth (Piles et al., 2000). Proportion of gastro-intestinal tract was lower than in synthetic meat line (Piles et al., 2000) and SIKA sire line C (Kermauner and Zgur, 2002).

Results obtained for Slovene SIKA meat line show moderate heterosis effect in growth performance, but for better expressed linecrossing effect...
the time from the beginning of the separate selection of maternal and sire lines is probably too short. Namely, the selection of sire SIKA line C started from one part of maternal SIKA line population in the year 1995. In selection of SIKA meat line special attention has to be paid on improvement of FCR.

Table 2.  Growth performance during fattening and slaughter traits of rabbits of different genotypes.

|                    | A      | C          | AxC    | AxCal | A      | C          | AxC    | AxCal |
|--------------------|--------|------------|--------|-------|--------|------------|--------|-------|
|                    | LSM ± SE | LSM ± SE | LSM ± SE | LSM ± SE | LSM ± SE | LSM ± SE | LSM ± SE | LSM ± SE |
| DWG g/d            | 33.5 a | 39.4 b     | 38.1 b | 40.9 b | 1.67   | 1.01      | 1.17   | 1.88  |
| Feed intake        | 126 a  | 137 b      | 141 b  | 135 b  | 3.19   | 2.77      | 3.21   | 5.15  |
| FCR                | 3.78 a | 3.54 b     | 3.72 a  | 3.31 b  | 0.07   | 0.06      | 0.07   | 0.12  |
| Slaughter weight (SW) g | 2754 a | 3215 b      | 3094 b | 3001 b | 59.82  | 65.8      | 63.71  | 50.26 |
| Warm carcass weight | 1490 a | 1787 b      | 1716 b | 1651 b | 36.37  | 40.01     | 38.74  | 30.55 |
| Dressing percentage | 54.11 a | 55.56 a | 55.46 a | 54.87 a | 0.36   | 0.39      | 0.38   | 0.30  |
| Liver % SW         | 3.23 a | 3.19 a      | 3.64 a  | 3.59 a  | 0.13   | 0.14      | 0.14   | 0.11  |
| Kidneys % SW       | 0.63 a | 0.54 b      | 0.58 a  | 0.58 a  | 0.01   | 0.01      | 0.01   | 0.01  |
| Gastro-intestinal tract % SW | 15.97 a | 14.32 a | 15.55 a | 16.87 a | 0.72   | 0.79      | 0.77   | 0.61  |
| Stomach % SW       | 4.86 a | 4.31 b      | 4.61 a  | 5.22 a  | 0.21   | 0.23      | 0.22   | 0.17  |
| Small intestine % SW | 3.08 a | 2.85 b    | 3.31 b  | 3.24 b  | 0.11   | 0.12      | 0.12   | 0.09  |
| Caecum % SW        | 5.31 a | 4.94 b      | 5.39 b  | 5.48 b  | 0.21   | 0.23      | 0.22   | 0.17  |
| Colon % SW         | 2.70 a | 2.30 b      | 2.24 b  | 2.92 b  | 0.63   | 0.70      | 0.67   | 0.53  |

A - SIKA maternal line; C - SIKA sire line; AxC - hybrids between A and C; AxCal - crossbreds between A and Californian breed;

∧∧ = P ≤ 0.05

Table 3: The heterosis estimates (in %) for fattening and slaughter traits of hybrids AxC.

| Trait                          | Heterosis (%) |
|-------------------------------|---------------|
| Weaning weight (at 36 day)    | 4.06          |
| Live weight at 91<sup>st</sup> day of age | 3.38          |
| Feed intake                   | 6.97          |
| DWG g/d                       | 3.08          |
| FCR                           | 2.68          |
| Slaughter weight (SW) g        | 4.45          |
| Carcass weight                 | 5.65          |
| Dressing percentage            | 1.26          |
| Gastro-intestinal tract (%) SW | 2.13          |

REFERENCES

Dalle Zotte, A., Ouhayoun, J., 1998. Effect of genetic origin, diet and weaning weight on carcass composition, muscle physiochemical and histochemical traits in the rabbit. Meat Sci. 4:471-478.

Kermauner, A., ZGUR, S., 2002. Growth and carcass traits of two rabbit genotypes: comparison of Slovene SIKA male line with commercial hybrids. Acta Agraria Kaposvariensis 6, 2:201-207.

Noval, R.Y., Toth, S., Virag, G.Y., 1995. Carcass traits of purebred and crossbred rabbits. World Rabbit Sci. 3-4:277-284.