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PERFORMANCE IN PLEIN-AIR RABBIT REARING: FATTENING PERIOD

F. Luzi*, S. Bolis, E.L. Heinzl*, C. Castrovilli** and C. Crimella*.**
*Istituto di Zootecnica - Facoltà di Medicina Veterinaria - Università degli Studi,
via G. Celoria, 10 - I 20133 Milano Italy
**Istituto di Zootecnia Generale - Facoltà di Agraria - Università degli Studi,
via G. Celoria, 2 - I 20133 Milano Italy

SUMMARY - Over a seven months period (from June to December), the trend of the fattening performance was investigated in five plein-air rearing systems utilising the same management and cages but different genetic strains. The trial took place in the north-east of Italy with a continental climate. Animals were moved to plein-air cages after weaning period (38 d; average of weight alive: 1,025g) till the end of the fattening period (82-90 d; average of weight alive: 2,740g). 25 fattening cycles have been considered corresponding to about 33,770 animals. The analysed parameters were: farm, months, genetic strain, daily weight gain (DWG) and mortality causes divided into: respiratory, enteric and others. The results showed that the farm and the genetic strain were not statistically significative *vs* DWG and mortality. Only farm *vs* mortality (respiratory diseases) and months *vs* DWG showed significant effects. In the first one, the significative value ($P<0.01$) was noticed just in one farm, but considering that the mortality distribution among months is not significant, the difference is probably linked to the management. In the second one, the month *vs* DWG resulted statistically significative ($P<0.05$). It probably depends on the high temperatures: in fact, the best DWG was in December (41 g) and the worst was in August (32.6 g). These results are comparable to those obtained in intensive rabbit farms.

Key words: Rabbit, plein-air system, season, fattening performance.

RESUME *- Cinq élevage qui utilisent les mêmes cages plein - air pour l'embouche, le même management, mais des différentes souches génétiques ont été étudiés. L'essai c'est déroulée dans le nord-est de l'Italie, dans une zone continentale (valeurs de température entre 0 et 31° C et de humidité relative entre 72 et 87%), pour sept mois (juin- décembre). Les animaux ont été introduits, au moment du sevrage, dans les cages plein - air à 38 jours (1025 g) et abattus à 82-90 jours (2740 g) en moyenne. On a suivi 25 cycles d'embouche, à savoir 33.770 animaux. Les suivants paramètres ont été évalués: élevage, mois, souches génétiques, gain moyen quotidien (GMQ) et causes de mortalité (pulmonaires, entériques, autres causes). Les résultats ont montré que l'élevage et la race - population ne diffèrent pas significativement par rapport aux GMQ et la mortalité. Au contraire, l'élevage a montré une différence significative par rapport aux causes de mortalité, ainsi que le mois par rapport au GMQ. Dans le premier cas, la différence n'était significative ($P<0,01$) que dans une ferme, mais si on considère que la distribution mensuelle de la mortalité n'était pas significative, la différence est probablement due à la conduite de l'élevage. Dans le deuxième cas, le mois vs GMQ étaient significativement différentes ($P<0,05$). Ceci est probablement dû à la température très élevée, en effet le GMQ le plus grande a été en décembre (41 g), tandis que le GMQ le plus petite était en août (32,6 g). Ces résultats sont comparables à ceux qui ont été observés dans l'élevage intensif.*

Mots - clés: *Lapin, cages plein - air, saison, période d'embouche.*

INTRODUCTION

At the present the most important topic in rabbit rearing and research is to improve the production, taking into account farmer requirements, animal welfare and habitat. (Crimella *et al.*, 1988; Costantini and Castellini, 1990; Mori and Bagliacca, 1990).

It is well known that rabbit is very sensitive to extreme temperatures (Luzi *et al.*, 1992);

notwithstanding it is able to defend from cold because the tegumentary apparatus is made by a thick coat, but in hot condition reproductive performance are mostly affected, with a decrease in libido, fertility, semen quality and so on.

In order to keep an adequate temperature in the recovery, it is necessary to sustain high cost for the heating and ventilation systems, both in planning and management phases.

Therefore, a lot of researches concerning the plein-air rearing system has been developed, showing the suitability of this type of management. (Finzi, 1992; Colin, 1994; Crimella *et al.*, 1996). The purpose of the present experiment was to study the performance of fattening rabbits (from weaning to slaughtering) rearing in the plein-air system in different periods of the year.

MATERIAL AND METHODS

Over a seven months period (from June to December) a trial was performed in five intensive rabbit farms in north-east of Italy with a continental climate.

The management and the animal keeping condition were similar; rabbits were commercial hybrids (Hyla, Grimaud) and pure race (New Zealand White), fed with a commercial pelleted diet (17% of crude protein and 15% of gross fibre).

Animals were reared inside until weaning under normal environmental conditions (12h of light, temperature ranging from 16 to 22°C and relative humidity from 60 to 70%).

The bicellular plein-air cages were built with insulating panels and galvanised iron sheet (26 x 46 x 28 cm) and were shaded by trees.

The rabbits were removed from the inside cages after weaning at 38 days of age, with a mean weight of 1,025 g and, after the fattening period, were slaughtered from 82 to 90 days, with a mean weight of 2,740 g. Twenty five productive cycles were considered, for a total of 33,770 animals.

The controlled parameters were: month of transferring and age of animals, number and weight at the beginning and at the end of every cycle, mortality causes divided in respiratory, enteric and others.

The control of feed intake and of weight gain was performed in order to evaluate the feed conversion rate.

The results were analysed by the General Linear Model procedure utilising breeding and months like fixed effect and the Least Square Means statement. (SAS, 1990).

RESULTS AND DISCUSSION

Temperature ranging from 0° to 31°C and Relative Humidity from 72 to 87% (fig. 1).
The results of mortality causes had a statistical significance only for respiratory diseases. The most significant value ($P<0.01$) was found only on one farm of the five examined, but considering that the mortality rate distribution between the months of sampling did not result significant ($P>0.05$), the problem was probably linked to the skill of labour (tab. 1 , fig. 2).

When we compared the monthly progress of daily weight gain, it resulted statistically significant ($P<0.05$) confirming once again the sensibility of the species to high temperatures given that the best increase was obtained the month of December (DWG=41.0±1,3 g) while the worst was obtained the month of August (DWG=32.6±1.6 g) (tab. 2, fig. 3).

From the analyses conducted we could observe how farm and breed/hybrid did not result statistically significant when compared with DWG and mortality causes (respiratory, enteric and others).

Therefore the only significant results obtained regard comparing farm *vs* mortality (respiratory disease) and the month of observation *vs* DWG. The total feed conversion rate resulted on average

of 3.7 in the summer and of 3.9 in the winter. These values could be assimilated to those obtained in other intensive rabbitries of this zone.

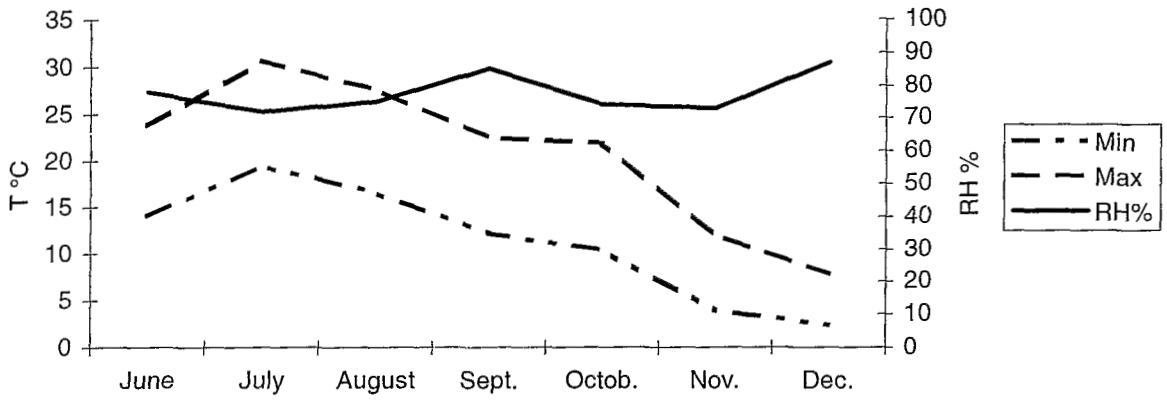

Figure 1 - Monthly temperature and relative humidity evolution during the trial.

Table 1. Number of dead/respiratory diseases (Least Square Means ± *standard error* and probability) among the farms during the trial.

	1	**2**	**3**	**4**	**5**
Number of dead	9.5 ± *6.2*	3.0 ± *8.8*	21.0 ± *3.6*	1.0 ± *6.2*	1.8 ± *2.8*
1		0.5544	0.1286	0.3479	0.2747
2			0.0762	0.8549	0.8981
3				0.1320	0.0006
4					0.9079

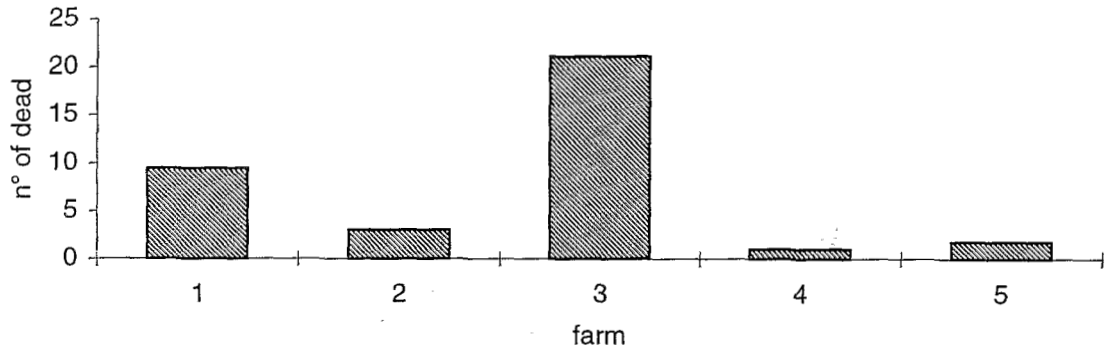

Figure 2. Evolution of the mortality (respiratory diseases) among the farms during the trial.

Table 2. Monthly Daily Weight Gain (Least Square Means ± *standard error* and probability) during the trial

	June	July	August	September	October	November	December
DWG (g)	37.7±*1.2*	37. ±*2.3*	32.6±*1.6*	34.2±*2.3*	35.8±*1.0*	38.3±*1.6*	41.0±*1.3*
June		0.9768	0.0292	0.1997	0.2374	0.7976	0.0983
July			0.0994	0.2939	0.4431	0.8768	0.2683
August				0.6089	0.1396	0.0354	0.0025
September					0.5432	0.1801	0.0287
October						0.2290	0.0113
November							0.2331

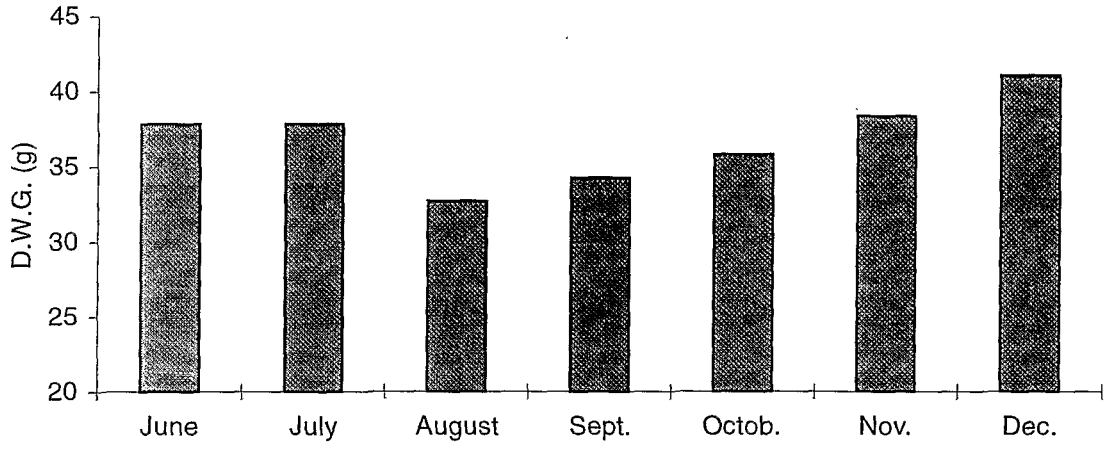

Figure 3. Evolution of Daily Weight Gain during the months.

CONCLUSIONS

The present trial was performed, from June to December, in 5 farms situated in north-east of Italy. Rabbits were reared, from weaning to slaughtering, in plein-air conditions. We have observed that DWG is significantly affected by the month and mortality (respiratory diseases) could depend from the farm. Furthermore, we can notice how productive performance in animals raised in plein-air don't show great differences when compared to traditional intensive rearing, maintaining controlled environment conditions in accordance with other authors (Brouet, 1993; Colin, 1994; Colin and Meneghin 1994). Considering that the plain air rearing reduces investment costs and labour we could confirm that also in particular climate conditions (temperature and relative humidity very high in summertime and very low in wintertime) this type of cages is recommended if correct management are provided.

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