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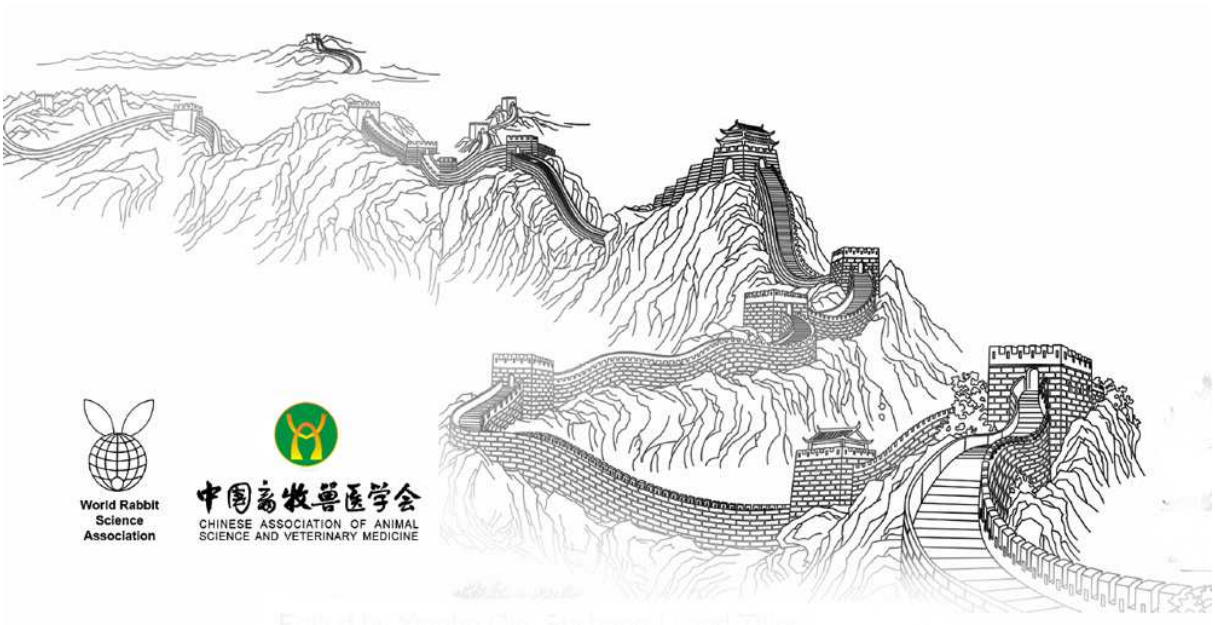

# PRODUCTION PERFORMANCES OF RABBIT DOES IN A PART-TIME GROUP HOUSING SYSTEM

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## ABSTRACT

Production performances were studied using an innovative park system (20 000 cm²) allowing part-time group housing of 4 does during 3 weeks of the 42-d reproduction cycle. Internal walls were placed in the parks from 3 days before till 18 days after kindling to create 4 individual units. This system was compared with the classical individual cage system (3 800 cm²). During 4 reproduction cycles, in total 3 x 24 pregnant Hycole females were housed in enriched cages (control group) or in 6 parks with a wire floor or in 6 parks with a plastic floor. Two identical rooms and equipments were available, allowing to transfer the does at weaning to the 2nd room (all in all out management). A standard conventional management with A.I. was used. Fertility of does amounted 90.3% in cages and 88.9% and 83.3% in pen systems (not significantly different). Mortality before grouping of the does ($P<0.05$) and after grouping was somewhat higher in pen systems which could be at least partly related to construction errors in the parks. The floor in the pen system did not have an effect on the production traits. Performances in cages were higher (+3.3% weaned, +8% higher weaning weight). However, overall performance level in the pen systems was high (9.9 young were weaned per litter *vs* 10.2 in cages) which demonstrates the possibility of such a part-time group housing for does with young.

**Key words:** Housing; Rabbit does; Part-time group-housing, Performances

## INTRODUCTION

Under commercial production circumstances, rabbit does are nearly exclusively housed individually during their whole lifespan (EFSA, 2005). However, as in other animal species, individual housing systems are increasingly questioned as it is thought to impair welfare.

In the past, several efforts have been done to establish a commercial group housing system for reproducing does (see review Szendrö et al., 2013). Although promising results were obtained in Switzerland (Andrist et al., 2013), performances under actual commercial management practice were disappointing and much lower than with the common individually housing (Szendrö et al., 2013).

Several other studies have tried to tackle the main problems of group housing of rabbit does Using an ear tagged electronic nest-box recognition system, Rommers et al. (2006) could avoid the high kit mortality due to double used nest-boxes. In view of optimizing the management and hygienic conditions also artificial insemination was introduced in group-housing systems (Rommers et al., 2006; Andrist et al., 2013). However, the problems (pseudo-pregnancies, skin injuries and/or lower productivity) could not be tackled although the group-housing pens, in contrast with commercial cage housing systems, were divided into different functional areas.

Because the problems with group-housed rabbit does occurred mainly around littering, a temporarily isolation period (3d before littering till the young leaves the nest boxes) by unlocking the round holes between the conventional cages was tested by Rommers and De Jong (2011). However, although the productivity results were promising, the problem of a high level of skin injuries remained.

Therefore, a commercial pen system was proposed allowing temporarily group-housing of 4 does which is also used after weaning to house the weanlings in group till slaughter age (Maertens et al., 2011). This system with double purpose pens, also named polyvalent park system, was compared in

the current study with the classical individual cage system. During the 42-days reproduction cycle, does were part-time housed individually (21 days) and part-time in group (21 days).

## MATERIALS AND METHODS

Two identical rooms and one spare room of an experimental house were used for the trial. The experimental rooms were both equipped with 24 enriched cages and 12 polyvalent park systems each for housing of 4 does. In the spare room 12 identical cages and 4 park systems were available.

**Cages** used as control group and the experimental parks were homogeneously distributed in all rooms and aligned in two double rows. Each individual flat deck cage (Meneghin s. r. l., Italy) had a floor area of 38 x 100 cm and an elevated platform of 38 x 30 cm. The floor and platform were made of 2.5 mm wide metal wires spaced 13 mm apart. A plastic foot rest (Meneghin s. r. l., Povegliano, Italy) of 25 x 40 cm was mounted on the wire floor in the middle of the cage.

The **park housing system** (Van der Vinne, The Netherlands) housed 4 does and measured 100 x 200 cm. In addition, a plastic slatted platform of 200 x 30 cm was available. The nest boxes (33 x 24 x 28 cm length x width x height) were external in these parks. Parks were roofless. Half of the parks were equipped with a wire floor and foot rests as in the individual cages (1 foot rest per doe). The other parks had a specific plastic floor developed for rabbits with 18 mm wide slats separated by 11 mm wide slats.

Three days prior to each kindling, three internal walls were placed separating each park into 4 equal units of 50 x 100 cm plus 1500 $cm^2$ of platform. 18 days after kindling the 3 walls were removed and the 4 does and their young could use the entire park area of 200 x 100cm. In this way, a part-time group housing system was tested with 21d individual housing and 21d group-housing during each reproduction cycle.

Seventy-two 29-week-old pregnant Hycole primiparous does (Hycole, France) were allotted randomly to one of the 3 housing treatments (individual wire cages or pens with a wire floor or plastic slatted floor, 24 does per treatment) 3 d before their second kindling. All does were ear tagged and does remained always in their treatment group during the 4 consecutive experimental reproduction cycles. However, they were moved to another experimental room each cycle at the time of weaning (32 d post-kindling), where they were housed in clean cages or parks of the same type (all in all out system).

Does were inseminated 11 d after kindling. If not pregnant, 3 d prior to the next kindling, these does were exchanged with pregnant does from the spare compartment (within treatment). Three days pre-partum, all does were regrouped to create new groups of unfamiliar does in each park. Using intra-group cross fostering of young, litter size was standardized to 10 young at latest on day 2 after kindling, but because of the higher litter size than expected, all litters of experimental cycles 3 and 4 were standardized at 11 young.

The does had *ad libitum* access to a commercial pelleted rabbit feed (except for non-pregnant, non-lactating animals, which were limited to 140 grams per day). Water and a simple cage enrichment (a wooden gnawing block) were available continuously to all does.

Productive performances were compared during 4 consecutive cycles. In total 96 litters (4 x 24 litters) per treatment were studied. Data were analyzed using the ANOVA procedure. A linear model including the effects of treatment, parity and their interaction was used. Differences between means were tested by the least significant difference test. Mortality rate was compared using Pearson's Chi-square test.

## RESULTS AND DISCUSSION

An overview of the performances is shown in table 1. Fertility expressed as litters/inseminations was very high in the control group: 90.3%. In both park systems, fertility was somewhat lower (not significantly) but on average 86% which is much higher than in the group housing system of Szendrö et al. (2013). Because does were introduced to our group housing system 7 days after insemination, early abortion or resorption of the embryos was feared due to aggressive interactions between does.

However, a clear tendency was not observed. Litter size was high in all treatment groups and did not differ.

**Table 1.** Overview of the performances of does housed in a part-time group housing system (park) or in cages

| Housing | Park "wire floor" | Park "plastic slatted floor" | Cage | P |
|---|---|---|---|---|
| Litters, N° | 96 | 96 | 95 | - |
| Fertility, % | 88.9 | 83.3 | 90.3 | 0.441 |
| Young/litter | 11.8 ± 3.2 | 12.2 ± 3.6 | 12.3 ± 2.4 | 0.682 |
| Litter size, d 18* | 10.11 [b] ± 0.89 | 10.09 [b] ± 0.85 | 10.34 [a] ± 0.59 | 0.004 |
| Litter size, at weaning | 9.90 [b] ± 1.01 | 9.91 [b] ± 1.02 | 10.23[a] ± 0.72 | 0.002 |
| Mortality, d 1-18, % | 3.7 [a] | 3.9 [a] | 1.5 [b] | 0.020 |
| Mortality, d 18-32, % | 2.1 | 1.8 | 1.0 | 0.131 |
| Weight young, d 18 (g/young) | 305 [b] ± 29 | 301 [b] ± 32 | 318 [a] ± 34 | <0.001 |
| Weight young , d 29, g/young) | 595 [b] ± 44 | 609 [b] ± 48 | 657 [a] ± 81 | <0.001 |
| Total weaned | 950 | 952 | 972 | . |

* Litter 2 and 3: standardised at 10 young, litter 4 and 5: standardised at 11 young

Before the age of 18 days, young and mother were still individually housed in the semi-group housing system and thus comparable with the control group. However, the mortality rate in our park systems was higher (and by consequence the litter size at day 18 was lower) compared with the control group housed in classical cages. The reason was the construction of the nest-boxes in the semi-group housing system. Young could leave the nest-box early but had difficulties to return. After the first experimental cycle, nest-boxes were adapted and the difference in mortality before the age of 18 days was no longer significantly higher (Figure 1).

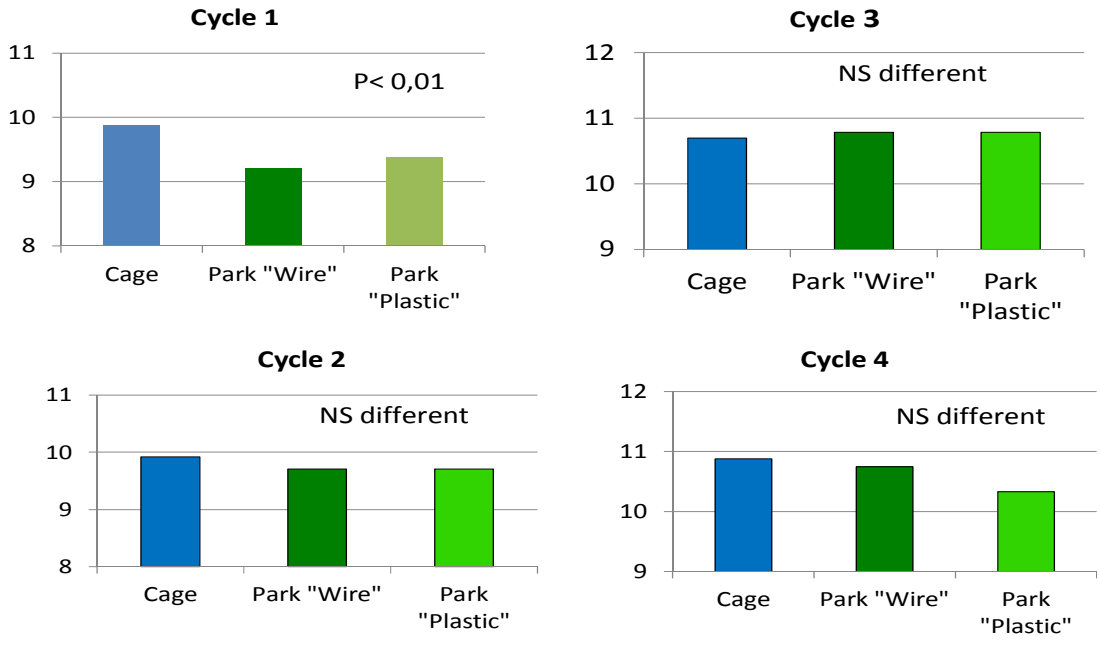


**Figure 1.** Litter size at day 18 during the 4 reproduction cycles.

Between day 18 (removing of the partitions in the pens) and weaning, losses of young was also somewhat higher (2% *vs* 1.0% in cage) in the group-housing system. Again part of this effect could be related to the experimental equipment. In the park systems, the distance from the floor to the nipple drinker was 28 cm (only 22 cm in the cages). As a result, some of the young (litters) had problems to find the nipples which resulted in weakened young. From the second cycle off, an adaptation was done to try to solve this problem.

Anyway, mortality rates after grouping of females was low and losses due to aggressive behaviour of females were not clear. The litter size at weaning was somewhat higher ($P<0.01$) in cages and in both park systems.

A significant lower young weight was observed already at 18 days of age in the semi-group housing systems (4-5%). This difference amounted 7-9% at day 29. An explanation could partly been given by the already mentioned problems (with the nest-boxes and drinking system), in our innovative part-time group systems. Nevertheless, also Rommers and De Jong (2011) found in their semi-group housing system a 6% lower weaning weight. Causes could be the disturbed suckling behaviour or a lower feed intake of the young because they remain longer in the protected nest-boxes.

The floor (wire + footrests *vs* plastic floor) in the 2 pen systems did not have an effect on none of the production traits measure.

Anyway, the performances were somewhat lower in the semi-group housing systems compared with individual cage housing. However, with an average fertility rate of 86% and 9.9 young weaned per litter, performances were even higher than the average performances in French farms (Coutelet, 2013).

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## REFERENCES

Andrist, C.A, Van den Borne, B.H.P., Bigler, L.M., Buchwalder, T., Roth, B.A., 2013. Epidemiologic survey in Swiss group-housed breeding rabbits: Extent of lesions and potential risk factors. *Preventive Vet. Med. 108, 218–224.*

Coutelet, G., 2013. Résultats technico-économiques des éleveurs de lapins de chair en France en 2012. *15èmes Journées de la Recherches Cunicole en France, Le Mans, 19-20 Novembre, 111-114.*

EFSA, 2005. The impact of the current housing and husbandry systems on the health and welfare of farmed domestic rabbits. *EFSA J. 267, 1-137.*

Maertens, L., Rommers, J., Jacquet, M., 2011. Le logement en parcs, une alternative pour les cages classiques dans un système "duo"? *Proc. 14ième Journ. Rech. Cunicole, Le Mans, France, 85-88.*

Rommers, J.M, Boiti, C., De Jong, I., Brecchia, G., 2006. Performance and behaviour of rabbit does in a group-housing system with natural mating or artificial insemination. *Reprod. Nutr. Dev. 46, 677–687.*

Rommers, J.M., De Jong, I., 2011. Combihuisvesting van voedsters: Resultaat na één jaar proefdraaien. *NOK Kontaktblad 29 (Februari), 3-10.*

Szendrő, Z., Mikó, A., Odermatt, M., Gerencsér, Z., Radnai, I., Dezséry, B., Garai, É., Nagy, I., Szendrő, K., Matics, Z., 2013. Comparison of performances and welfare of single-caged and group-housed rabbit does. *Animal 7, 463-468.*

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