A GROUP-HOUSING SYSTEM FOR RABBIT DOES IN COMMERCIAL PRODUCTION: A NEW APPROACH

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ABSTRACT

An overview is given of experimental work done in The Netherlands on the (further) development of a group-housing system for breeding does. In The Netherlands, high priority is given to replace the regular individual housing by more welfare-friendly and sustainable housing systems. An individual electronic nestbox recognition (IENR) system was developed, as the basic component of a group-housing system. For the IENR technique a chip is attached to an ear of a doe. With this chip a doe is able to open a door giving access to her nesting box only. The technique was first tested with pair-housed does. Two designs of an IENR system, and two prototypes of a group-housing system for breeding does, are described. Currently, a second design of the IENR system, and a second prototype of a group-housing system are being investigated on three commercial farms.

Key words: group-housing, breeding does, sustainability, IENR technique.

INTRODUCTION

In The Netherlands, there is a growing concern on the welfare of rabbits kept under commercial farming conditions. In 1997, The Dutch Ministry of Agriculture, Nature Management and Fisheries has asked an advisory board to give recommendations to improve the welfare of rabbits, and to come to a more sustainable production. A number of research questions was formulated, and it was indicated that priority should be given to investigate the possibility of keeping does in breeding groups, to replace the regular individual housing. In 2001, the division Applied Research of the Animal Sciences Group in Lelystad in The Netherlands started a first experiment on group-housing of breeding does. Before the project started, a thorough study of available literature was carried out. The survey of the literature was put together in a Dutch report (RUIS and KIEZEBRINK, 2001). The report discusses the possibilities to arrange several components of the housing systems to meet the needs and requirements of the rabbits. It also presents the experiences and results which were already obtained in different prototypes of group-housing systems. It became clear that a substantial number of problems may be encountered when breeding does are kept in group-housing systems. These are for instance:

- A high mortality of young rabbits, basically caused by the free entrance of does to nestboxes of other does.
- Problems with the replacement and introduction of new does in groups, due to high aggression.
- Group-housing during the breeding period probably also requires group-housing during the rearing period.
- The system is labour-intensive because it needs a good monitoring of the breeders and litters and cleaning is more difficult.
- The system requires high hygienic standards.
- A lack of animal recognition of young rabbits makes selection of breeding does more difficult.
- Production costs in group-housing systems are expected to be higher than in regular individual housing systems.

It is expected that the problems of high mortality of young rabbits and high labour-intensity can be solved by the use of individual electronic nestbox recognition (IENR) systems, only allowing a doe to have access to her own nestbox. We therefore considered an IENR system to be the basic component for a group-housing system, which had to be developed first.
The present paper describes the different phases of the research from 2002 until the beginning of 2004. Detailed papers on the different experiments will be published later. Some results of these experiments are presented in this paper. In all experiments, New Zealand White rabbits were used.

THE FIRST PROTOTYPE OF AN IENR SYSTEM

The first design of an IENR system had the following characteristics:
- A chip was attached to the ear (figure 1).
- Each chip only opens a door in a tunnel-like link to a nesting box. Each square tunnel had a length of 35 cm and had inner dimensions of 16 x 16 cm (figure 2).
- The door is operated by a chip when a doe enters the tunnel from the pen, but the door can be opened freely by the doe and pups when entering the tunnel from the nesting box.

Figure 1. Chip in ear of doe

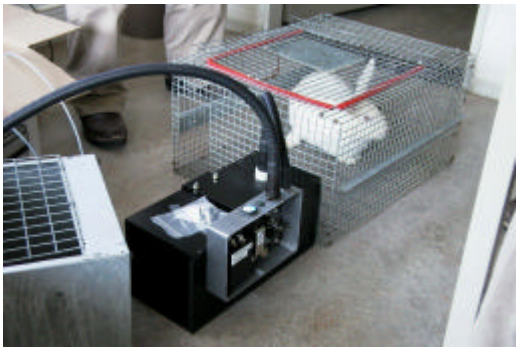

Figure 2. Tunnel-like link to nesting box, including a door to be operated by a chip

Experiment.

A first test of the IENR technique was performed with pair-housed does. It is known that pair-housing of breeding does may lead to a lot of aggression, especially when the animals are close to giving birth (REICHEL, 1995). It was therefore interesting to know whether this was also true when there should be no competition for nesting boxes, by introducing the IENR technique. We introduced the factor familiarity in the experiment, by forming pairs of littermates (LP, n=5) and pairs of non-littermates (NP, n=5). Pairs were formed at 13 weeks of age, and housed in cages measuring 100 (length) x 60 (width) x 50 cm (height) cm (figure 2). At 16 weeks of age, they were inseminated, and subsequently observed during pregnancy and lactation period of the first litter.
Importantly, the technique worked without failure and was accepted without problems by the does. However, aggression was highly influenced by familiarity between does. In three cages of the NP treatment, animals either died or had to be removed due to high aggression. In addition, does of NP pairs showed a higher (P=0.1) frequency of external wounds, caused by fighting. Reproduction performance was not affected by familiarity, as litter size and numbers of stillborn young did not differ. Degree of familiarity also did not affect body growth.
It was concluded that the degree of familiarity did not have consequences for reproduction performance and initial body growth of young breeding does. However, very important, aggression prevailed when two unfamiliar does were kept together in breeding units, leading to serious loss of animals. From a welfare and economic perspective, it may therefore be advised for commercial purposes to house familiar animals together.

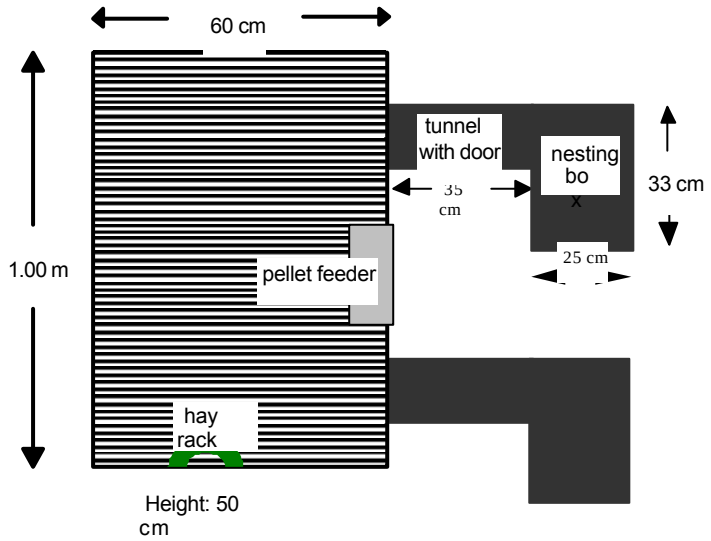

Figure 3. The pair-housing cage system, including the IENR technique

THE 'STAUFFACHER SYSTEM' AS A BASIS FOR A MODIFIED GROUP-HOUSING SYSTEM

First prototype

The Stauffacher system (STAUFFACHER, 1992) was used as a basis for a modified group-housing system for breeding does. This modified system had the following characteristics (see also figure 3):

- The IENR system, first tested in pair-housing, was used to give a doe unique access to her own nest.
- A group consisted of 8 does, 1 buck, and offspring until weaning. Does were placed together at 17-18 weeks of age. A buck was introduced 5-7 days later.
- Total floor dimensions of the system were 2.5 x 1.8 m.
- Nesting boxes were elevated, in order to create a resting area underneath the nesting area. The elevated floors to reach the nesting places were made of solid wood.
- The floor consisted of an artificially slatted floor (Termaat, black). Part of the floor (1 x 1 m) in the resting area was bedded with straw.
- In the feeding area, two pellet feeders were provided, several nipple drinkers and a hay rack.
- A pup area was created, only accessible for pups. In this area, pups were able to feed, drink and rest separately from the adult animals.

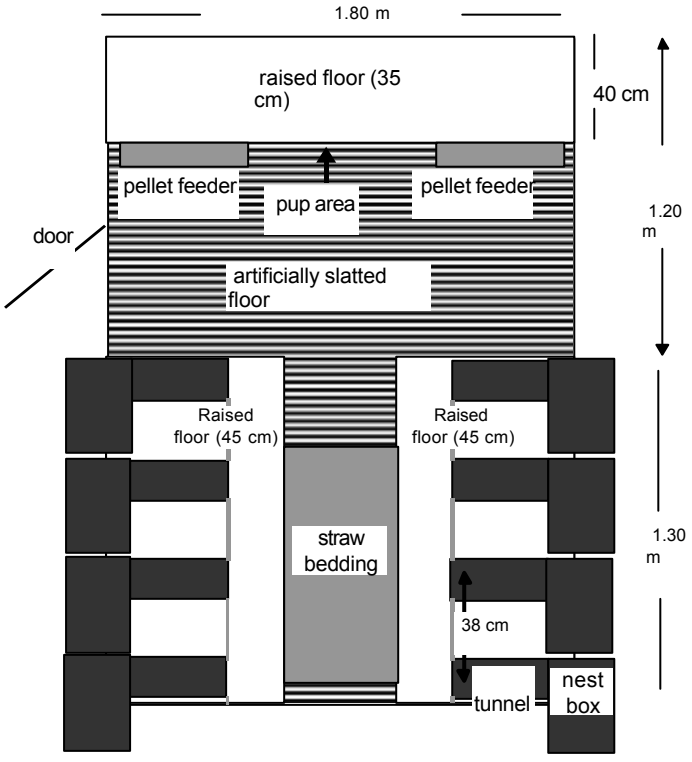

Figure 4. The first prototype of the modified group-housing system

Figure 5. Part of the group-housing system: artificial flooring, straw area, raised nesting places, IENR system

Experiment

In a first experiment, breeding results of 3 groups of does were compared to those of 20 individually housed does (cage dimension of 50 x 60 x 30 cm). The latter animals were inseminated 10 days after giving birth (semi-intensive breeding). The experiment lasted half a year. Table 1 shows that total litter size, the number of kits born alive and culling, did not significantly differ between group- and individual housing. Importantly, the mortality of young rabbits was very low. This is importantly related to the controlled access of does to nesting places, by using the IENR system.

Table 1. Breeding results of individually- and group-housed does

	Individual	Group
Total litter size	8,52	9,02
Kits born alive	7,33	8,32
Culling until 14 days	10,6	10,2
Weight kits at 14 days (g)	257,4	255,7
Culling between 14 days and weaning	1,3	0.8

Numbers of skin lesions were used as indication for aggressiveness. Moderate and severe injuries were rarely observed throughout the experiment. The solid floors and the straw area became dirty by manure and urine. The hygiene of the first prototype did therefore not reach the desired standards, and had to be improved.

IMPLEMENTATION OF GROUP-HOUSING ON DUTCH COMMERCIAL FARMS

Second prototype

In 2003, a project on group-housing of breeding does has started on 3 commercial farms in The Netherlands. In this project, under our scientific supervision, a second prototype of a group-housing system is tested. The three participating breeders each house 24 does in breeding groups. In the same experimental room, between 24 and 48 does are individually housed as controls. Durability of the system (materials), production results, hygiene, disease risk, production costs, and management, are thoroughly looked at. Data will be analyzed in the second half of 2004. The second (and current) prototype has the following important changes:

- The IENR system is modified (second design). The tunnel-like link to the nesting box is now made of a round plastic pipe. This decreases the costs because the production process is easier, and the material is cheaper.
- The pen is made of a more durable material, i.e. metal instead of wood.
- The following changes are made to improve hygiene, or to achieve this:
  - The raised floors consist of artificial slats (MIK, colour green) replacing the solid wooden floors.
  - A hay rack is used for hay and straw. Straw is not offered on the floor anymore.

  - Each pen has a different floor. One pen has a wire flooring (diameter wire: 3 mm), one pen has a MIK flooring (artificial slats; colour green), and the third pen has a Paneltim flooring (artificial slats, orange).
- In 2004, one breeder will test the possibility of artificial insemination with group-housed does. For this purpose, the does are not housed together with a buck.

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