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Epidemiologic survey in Swiss group-housed breeding rabbits: Extent of lesions and potential risk factors

Claude A. Andrist[a,*], Bart H.P. van den Borne[b], Lotti M. Bigler[a], Theres Buchwalder[a], Beatrice A. Roth[a]

[a] Swiss Federal Veterinary Office, Centre for Proper Housing: Poultry and Rabbits, Burgerweg 22, CH-3052 Zollikofen, Switzerland
[b] Veterinary Public Health Institute, Vetsuisse Faculty, University of Bern, Schwarzenburgstrasse 155, CH-3097 Liebefeld, Switzerland

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ABSTRACT

In Switzerland, group-housing for breeding rabbit does is not explicitly required by law, but label programmes, as well as the general public and animal welfare groups, are advocating it. Although group-housing is of great benefit to the gregariously living rabbits, the establishment of a social hierarchy within the group might lead to stress and lesions. In the present epidemiological study, lesions were scored twice on 30% of the breeding does on all 28 commercial Swiss farms with group-housed breeding does. Additionally, a detailed questionnaire was filled out with all producers to determine risk factors potentially associated with lesions. Data were analysed using hierarchical proportional odds models. About 33% of the does examined had lesions, including wounds that were almost healed and small scratches. Severe lesions were counted on 9% of the animals. Differences between seasons in lesions score were identified, with the extent of lesions being higher in summer than in spring. Fewer lesions occurred on farms on which mastitis was more common. More lesions were found on farms where the does were isolated between littering and artificial insemination than on farms without isolation. According to the producers, most of the aggression occurred directly after the isolation phase when the does were regrouped again. We conclude that lesions in group-housed breeding does might be reduced by appropriate reproductive management.

1. Introduction

1.1. Group-housing

Group-housing can lead to stress and lesions in many farm, pet and laboratory animals, as seen in horses (Vervaecke et al., 2006) and in mice (Van Loo et al., 2002). Other welfare problems associated with group-housing include feather pecking in laying hens and tail biting in pigs (Rodenburg and Koene, 2007). Keeping breeding rabbit does in group-housing systems is also suspected to lead to a number of difficulties, e.g. aggression, due to the introduction of new does in groups and a high pups mortality, caused by the free entrance of does to nest boxes of other does (Ruis and Coenen, 2004).

In the wild, European rabbits (*Oryctolagus cuniculus*) are social animals, exhibiting many gregarious behaviours such as grooming and foraging in groups (Fuentes and Newgren, 2008). Group-housing therefore appears to be an appropriate method for enriching the environment of breeding rabbits (Whary et al., 1993). However, rabbits live in social hierarchies, which are based on agonistic interactions (Mykytowycz, 1958). Females have been

* Corresponding author. Tel.: +41 031 915 35 18; fax: +41 031 915 35 14.
E-mail address: claude_andrist@hotmail.com (C.A. Andrist).

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reported to be less tolerant than males to unfamiliar conspecifics (Farabollini et al., 1991). Because of the restricted space provided in pens, the consequences of aggressive behaviour in group-housed breeding rabbits might be more serious, such as higher stress levels and severe lesions (Rommers et al., 2006), with very relevant implications for animal welfare. Furthermore, conflicts and disturbances within the group result in a lower reproduction rate, which in turn leads to economic losses. Nevertheless, according to a report of a working group on rabbit husbandry, the overall benefits of group-housing for the rabbits greatly exceed those of single-caging (Morton et al., 1993). With some exceptions in the Netherlands, breeding does in EU countries are generally housed in single cages (Rommers et al., 2006). For the last 10 years in Switzerland, commercial group-housing has become an innovative alternative to single-housing, which still remains common. Even though group-housing is not explicitly required by the law, it could be beneficial to the welfare of the naturally gregarious rabbits (Whary et al., 1993), as they have been shown to exhibit a wider behavioural repertoire (Mugnai et al., 2009) and to work hard for access to limited social contacts (Seaman et al., 2008). Additionally, as the group pens are larger compared to single pens, the set-up of the pen can be optimised, allowing better possibilities to divide the pens into functional areas and increase the space for locomotion. The general public and animal welfare organisations are therefore advocating group-housing for breeding rabbits.

1.2. Reproduction management

Until recently in Switzerland, does kept together were usually inseminated naturally; a process involving a 33-day reproduction cycle, in which the buck is introduced in the group pre-littering, usually for 10 days. Nowadays, Swiss rabbit breeders using group-housing apply artificial insemination (AI) with 33- or 42-day reproduction cycle. In the AI management with 33-day reproduction cycle, the does are inseminated directly after littering. In the 42-day cycle, the does on most farms are isolated from the 32nd day of pregnancy, just before the expected litter date, until 12 days post-littering, when they are inseminated again. During this isolation phase they are kept in a separated compartment with a nest, within their group pen. While olfactory, acoustic and visual contact is still possible (but limited), social interactions are completely prevented. Isolating the does inhibits mounting by other does post-littering, in a time when they are sexually receptive (Schlolaut et al., 2003), which often leads to pseudopregnancy. Isolation also prevents fighting for or defending the nests as well as double litters. Double litters occur when two does litter in the same nest, sometimes resulting in crushing of pups or in the does not suckling them properly. Furthermore, routine controls of isolated animals can be conducted more easily and accurately.

1.3. Objectives

Aggressive conflicts are part of the natural social behaviour of rabbits, especially during reproduction (Von Holst, 2002). They can involve agonistic interactions such as threatening, attacking, biting, boxing, chasing and ripping (Graf, 2010). Consequently, lesions caused by these conflicts cannot be avoided completely, but they could be minimised through appropriate housing conditions and management. In Switzerland, the extent of lesions in breeding rabbits in commercial group-housing systems is still unclear. The occurrence of lesions in group-housed does was confirmed in an interview with eight Swiss producers (Graf, 2010), but the frequency and the degree of lesions were not determined. The goal of this project was to determine the extent of lesions and to identify possible risk factors in group-housed breeding does in Switzerland.

2. Materials and methods

2.1. Farms

2.1.1. Housing of the animals

The commercial Swiss rabbit producers are all organised in two production chains. All 24 breeding farms of one chain and another 4 (out of 42) producers of the other chain keep their breeding rabbits in groups. Breeders from the first chain manage their animals according to a label programme requiring animal-friendly housing, which demands group housing and a separate nest for each litter. The pens are of similar sizes (at least 1.6 m^2 per doe, including the nest box) and share a similar design of the functional areas: the pens were open on top and the floor was divided into a central area for the adults and a smaller area for the pups. Some platforms and the nests were elevated. Hay was permanently available for the does. The 4 breeders from the second production chain did not produce according to this label programme, but their pens had a similar layout to the ones from the first chain.

2.1.2. Visits on the farms

Data were collected on all 28 Swiss rabbit farms with group-housed breeding does. Farm visits were conducted twice between March and September 2010, usually in the morning. The two visits on each farm took place at two different phases in the reproduction cycle of the does. The order of visiting the farms was randomised the first time. The second visit was planned in a different phase of the reproduction cycle and was at least one month apart from the first visit. One of the farms, which ceased rabbit production in the middle of the study, was only visited once.

2.2. Questionnaire

A detailed questionnaire was filled together with all producers during the first visit to detect parameters that might influence the occurrence of lesions. This herd-level questionnaire included closed and semi-closed questions about management, production, animal health and agonistic interactions (Table 1). There were also three open questions, in which the farmers were asked whether they observed agonistic interactions and if so, under which specific circumstances and how they thought such interactions could be reduced (the full questionnaire can be obtained from the first author upon request). It was based on a