

HOW FAR MAY RABBIT CAGE'S SPACE RECOMMENDATIONS REACH: THE GAP BETWEEN SCIENCE AND REGULATIONS

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ABSTRACT

Animal welfare is a major concern in livestock production. The impact of housing conditions on animal well-being is under study in several species such as chickens, laying hens, or pigs and, some European Directives have been developed in order to protect animal welfare. In these Directives aspects related to housing conditions have been regulated. Several attempts have been done to propose a European Directive for rabbit farming in terms of welfare protection, but any agreement have been reached for now. One of the main hot spots is related to cages design. Strong efforts are being made nowadays in order to reach a compromise to define cages characteristics which really benefit rabbits' welfare. In this context, the main aim of this work is to develop a critical review about rabbit does space needs in relation to cages design. It becomes necessary to determine the behavioural needs of rabbits in terms of welfare, so that the space requirements can be known. This might lead to define appropriate housing conditions, although the needs of the animal can change according to age, learning, diurnal rhythm, season and genetic relations. In general, regarding the height of the cages (as well as width), few papers have been found and a European Food Safety Authorities' report recognises, that in the absence of scientific evidence concerning these needs of rabbits, it may be important for growing rabbits to be able to sit and stand with ears erect, as well as rear up occasionally. Regarding the use of platforms, enriching the cage with raised platforms aims at satisfying the doe's need for isolation from the litter, rather than stimulating exercise. Nevertheless, the use of platforms may cause hygiene problems which have to be solved. Therefore, elevated platforms might be considered as environmental enrichment elements and not as structural needs. The patent general lack of information in the topic must be considered when new housing conditions are being proposed, and only those aspects which could lead to real improvement of rabbit's welfare have to be taken into account. The authors propose a cage size for lactating does of 45×75×38 cm (height, length and width) with a minimum surface of 3,500 cm² (nest-box not included).

Key words: Welfare, cage, space requirements, platform, does.

INTRODUCTION

Animal welfare is a major concern in livestock production and the impact of housing conditions on animal well-being is under study in several species such as chickens, laying hens, or pigs. In this sense, some European Directives have been developed in order to protect animal welfare. In these Directives aspects related to housing conditions have been regulated among other aspects such as transport or slaughter.

The housing of rabbits is related to behavioural, hygienic, environmental and welfare aspects (Hoy, 2008), and, especially, housing of rabbits in terms of welfare, is being discussed since the last 1990's. Two clear examples of this increasing interest were the COST action 848 (Maertens and Coudert, 2006) and a European Food Safety Authority scientific report (EFSA, 2005) addressed to this matter.

In this regards, several attempts have been done to laid the foundations of a future European Directive for rabbit farming in terms of welfare protection. Nevertheless, after 18 revisions of the initial draft, agreement have not been achieved and the draft revision was stopped in 2009 (European Commission, 2009).

One of the main hot spots of this discussion is related to cages design. In this sense, especial concerns have been raised that barren cages lead to poor welfare (Seaman et al., 2008) and, especially, decisions about cage dimensions are being dramatic. This last issue might be related to the big differences in the type of production among countries. Strong efforts are being made nowadays in order to reach a compromise to define cages characteristics which could lead to a real benefit on rabbits' welfare.

The main aim of this work is to develop a critical review about rabbit space needs in relation to cages design. To this aim, scientific information about rabbit needs in terms of space requirements and their behaviour will be explored. Current recommendations for cages design will be also analysed and discussed in order to achieve optimal dimensions based on both welfare and technical criteria. The case of rabbit does will be followed throughout this work as an example.

RABBITS AND SPACE REQUIREMENTS

Space restriction has been found to cause welfare problems in several livestock species and it has been argued whether domestic rabbits are well suited to live in small enclosures such as wire cages (Dixon et al., 2010). In this sense, knowing the motivation of the rabbits for different behaviours is crucial to lead to conclusions about their space requeriments (Szendro and Dalle Zotte, 2010).

Several authors defend that, based on the highly social behaviour in the wild, both reproducing and growing rabbits should be reared in groups (Trocino and Xiccato, 2006). Therefore, this is a conditioning factor when individual housing is used for rabbit rearing. To reduce the negative effects of isolation, the use of wired cages in which animals can keep visual and olfactive contact with other rabbits is an interesting tool.

Some studies of domestic rabbits in farmed and laboratory conditions have found that providing additional resources, space, and companionship allow a more varied behavioural repertoire. Nevertheless, the absence of a behavioural pattern does not necessarily indicate a poor state of welfare (Dixon et al., 2010). In these terms, it becomes necessary to determine the behavioural needs of rabbits in terms of welfare, so that the spatial requirements can be known. This might lead to define appropriate housing conditions, although the needs of the animal can change according to age, learning, diurnal rhythm, season and genetic relations (Hansen and Berthelsen, 2000). Thus, the main questions to solve are the behavioural needs, even more, for each type of animal: growing rabbits, males and females.

Nowadays, there is a lack of information in these aspects, so decisions have to be taken carefully. However, there are a few research groups working in these topic during the last years, and some of their findings are summarized subsequently:

- Gunn et al. (1995) made an inventory of rabbit behaviours and showed that they spent a large proportion of time inactive and perform exploratory behaviours when allowed. In addition, stading was more frequent than coprophagy or kicking wall, being all these activities less than 17% of the time.
- Selzer et al. (2004) found that when space allowance is increased and cage enrichment such as tunnels exists, does leave the pups more often.
- Jezierski et al. (2005) developed a motivation test and found 5168 cm² for inactive lines and 7300 cm² for active lines were the minimum cage size for growing rabbits.
- Princz et al. (2008a) found that rabbits kept in cages spent more time resting and the social and investigatory behaviours were more frequent in pens. In addition, aggressions occurred more frequently in larger groups.

- Princz et al. (2008b) stated that growing rabbits had a low preference for open top cages, whereas they liked to rest in low cages (20 cm), although locomotory behaviours were impaired. They finally propose 30-35 cm as enough.
- Negretti et al. (2010) found that adult rabbits did not have tendency to adopt postures in which more than 40 cm were required. Nevertheless, 0.5% of the total time was employed in postures with required more than this height.
- Hansen and Berthelsen (2000) found that rearing mean duration was higher than urinating or defecation, for example.

In general, regarding the height of the cages (as well as width), few papers have been found and the EFSA report (2005) recognises that in the absence of scientific evidence concerning these needs of rabbits, they consider that it may be important for growing rabbits to be able to sit and stand with ears erect, as well as rear up occasionally. They also suggest providing a minimum of 65-80 cm of length to lie down and 38 cm to turn round and to groom comfortably.

From this information (all or part of), several attempts of reaching proper cage dimensions have been made, and some of them are presented in Table 1.

Table1: Cage dimensions recommendations for does according to different sources

	Area per doe without nestbox (cm ²)	Minimum height (cm)	Minimum length (cm)	Minimum width (cm)
German branch WRSA ¹	4,000	40 (60 if elevated platform was present)	-	-
European Commission draft ²	3,500	30 except that at least 50% of the floor surface must have minimum height of 50	75	38

¹Hoy (2008); ²European Commission (2009)

Both proposals agree with most of the findings presented above, thus, they could be considered in general as welfare-friendly for does. Nevertheless, some discrepancies can be noticed mainly regarding the height recommendations (e.g. 30cm) which may restrict behaviours such as sitting with erect ears. On the other hand, the use of platforms is not completely justified in terms of welfare and hygiene as it will be discussed subsequently.

ENRICHMENT WITH PLATFORM

Enriching the cage with raised platforms aims at satisfying the doe's need for isolation from the litter, rather than stimulating exercise (Trocino and Xiccato, 2006) although results are contradictory (Szendro, 2006). In addition, EFSA report (2005) stated that there may be hygiene problems which have to be solved, such as faeces accumulation on the platform or urine and droppings falling onto the young rabbits.

Nevertheless, Seaman et al. (2008) found a motivation to reach access to platforms, although adult rabbits seemed to use it as a bolt hole in case of danger or even as a vigilant element, more than going on it. Moreover, Barge et al. (2008) pointed out that the interaction between genotypes and environment might have influence on the use of platforms. In addition, they found several productive aspects improved, whereas conception ability, for example, was reduced.

According to all this information, elevated platforms should be considered as environmental enrichment elements. In this context, its inclusion in cages might be understood as a possibility, as well as tunnels or gnawing sticks, among others.

CONCLUSIONS AND AUTHORS' PROPOSAL

In general, it seems clear that rabbits spend most of their time resting and they lie down totally extended when possible. However, other aspects such as the height needs are not so scientifically justified, as real needs of the animals have not been deeply assessed. In fact, Hansen and Berthelsen (2010) consider that height of the cage is important just because in the wild, a vigilant rabbit sits on its hindlegs with ears pricked (lookout position). In addition, it has been observed that, sometimes, needs are measured in terms of time dedicated to a certain activity, whereas we think that is the motivation to perform a certain activity the aspect which has to be taken into account.

This general lack of information must be considered when new housing conditions are being proposed and only those aspects which are definitely an improvement in rabbits welfare have to be taken into account. Moreover, it is important to bear in mind that modifying minimum cage dimensions may lead to change most cages in rabbit farms. This is extremely delicate when proposing a European regulation that should be applied in countries with strong differences in production systems. Thus, considering technical, economic and welfare aspects, the authors make a proposal (Olivaset *al.*, 2011) based on the scientific information available nowadays for cages for rabbit does as follows:

Area per doe without nestbox	Minimum height	Minimum length	Minimum width
3,500 (cm ²)	45 cm	75 cm	38 cm

These dimensions ensure rabbits' welfare as far as scientific research has provided information, they allow performing natural behaviours like lookout position, turning, etc. As it can be observed, they do not include platforms, which we consider it has to be added as an optional enrichment element. Other justified dimensions for other type of rabbits can be found in Olivaset *al.* (2011).

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