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CRITICAL POINTS IN THE TRANSPORT OF COMMERCIAL RABBITS TO SLAUGHTER IN SPAIN THAT COULD COMPROMISE ANIMALS' WELFARE

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Abstract: The welfare of commercial rabbits depends on the attitudes and handling procedures used by farmers, hauliers and abattoir personnel, as well as the transport logistics. Many studies have been performed on commercial rabbit production but less attention has been paid to identifying critical points during the whole transport procedure. In this study, a survey of rabbit transport was performed in Spanish abattoirs to determine the parts of the process that most compromise the animal's welfare. Data were collected for the methods for loading, unloading, transporting, holding and slaughter. Handling procedures differ widely among farms, especially regarding cage size (ranging from 1430 cm² to 10000 cm²). Loading facilities were adequate and transport time was short. Only a few hauliers had received specific training courses. The average time before the unloading was short (4.5±13.8 min) but holding time before slaughter was usually longer than one hour and varied widely between abattoirs (ranging from 0 min to 420 min).

Key words: rabbit, welfare, transport, slaughter, critical points, Spain.

INTRODUCTION

In 1989, the World Veterinary Association specified five freedoms, which were applicable to all animal species and based on Brambell (1965). The Farm Animal Welfare Council (FAWC) revised these rights in terms of freedom from thirst, hunger or malnutrition, freedom from discomfort, freedom from pain, injury and disease, freedom to carry out natural behaviour and freedom from fear and anxiety (Seamer, 1993).

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Most freedoms are respected but the last two are difficult to maintain during normal handling procedures in commercial animal production. Animal welfare can be seriously compromised after the animals leave the farm and are transported to a second farm or abattoir. During transport, animals are placed in cages and loaded on a truck, which could be considered a kind of moving pen. Under the best circumstances, the animals should be as comfortable during transport as on the farm, respecting the five freedoms mentioned above. Apart from that, loading and unloading stresses the animals since they are not used to this kind of handling.

In recent years the number of low throughput rabbit abattoirs in Spain has decreased substantially, increasing transport times (Rosell, 1991). This may have a negative effect on the animal welfare and meat quality (Jolley, 1990).

Aspects of animal welfare during the productive process until slaughter are considered an important research field. Hence, a survey of commercial rabbit transport was carried in Spain to identify critical points that could have adverse effects on animals, from loading at the farm to the slaughter at the abattoir.

MATERIALS AND METHODS

We surveyed the procedures for loading, transport, unloading and slaughter of rabbits in Spain from December 2003 to March 2004. The survey involved 60 farms, 21 abattoirs and 21 hauliers and completed in person (19 %), by telephone (9.5 %) or by mail (71.5 %) due to the geographical location. After receiving the filled-in questionnaires by mail all were revised and the unclear data were checked by telephone. All the hauliers were abattoir staff, as is normally the case in Spain.

Farmers were asked to answer specific questions regarding loading and handling facilities. The questionnaire was one page long and took about 10 min to complete. The original questionnaire is available at http://wzar.unizar.es/catra link *Proyecto Cotrans*.

Abattoirs were asked to complete a three-page questionnaire about unloading and handling facilities, conditions at the holding area and abattoir practices and post-mortem procedures.

Hauliers were questioned about transporting procedures, unloading and some vehicle characteristics. The transport and vehicle questionnaires were two-pages long and took nearly 20 min to complete. Almost three quarters of the questionnaires (71.5 %) were provided by mail, 19% were completed in person and 9.5 % by telephone.

Descriptive statistics and frequencies were calculated by using SPSS data editor 11.0.1 for Windows.

RESULTS

Loading

All the farms used a cage system for transport. The size of cages varied but most (68 %) were between 3500 cm^2 to 5000 cm^2 (medium sized cage). The mean height of the cages was 30.7 ± 9.3 cm. The number of animals per cage was normally 15 (36.7 %), ranging from 6 for smaller cages and 16 for bigger cages (see Table 1). The mean density per cage was 353.7 ± 127.5 cm^2/animal. The medium size cage had an animal density of 349.2 ± 83 cm^2/animal. The average number of cages transported per journey was 128, (range 24-508). Pre-loading cages (different from the transport cages where animals are located while waiting to be loaded) were not normally used. Instead, many farmers (75 %) used the cages from the feedlot for transport. Almost three quarters of the farmers had multi-floor cages on a roller stand, and the mean number of tiers on each stand was six.

Many farmers (50 %) loaded the animals very early in the morning and 16.7 % at midnight when the temperature was lower, especially in hot seasons. The mean loading time was 95.83 ± 59.76 min. Farmers reported a wide range of loading

times (10 to 240 minutes), but the most frequent loading time was 90 minutes (33 %). A hydraulic lift was used to load multi-floor cages. Approximately half of the farmers reported that the pre-loading and loading area were covered with a roof.

According to the farmers, the most common problems during loading involved weighing since the abattoir rejected animals above or below the commercial weight range (1-1.5 kg).

Transport

Since all hauliers were abattoir staff, the animals were taken from the farm and transported directly to the abattoir. Most of the trucks (76.2 %) were small with 2 axles (61.9 %), and an average floor area of 13.80 m^2. This allows room for

Table 1: Percentage of cages, average animals per cage and animal density in relation to cage size classes.

	Cage sizes		
	Size 1 (3500cm^2)	Size 2 (3500-5000 cm^2)	Size 3(›5000cm^2)
% of Total	20	68	12
Cage Size (cm^2)			
Average (±SD)	2608(±695)	4355(±450)	8773(±2578)
Maximum	3200	4800	10000
Minimum	1430	3600	5400
Animal per cage			
Average (±SD)	11(±3)	13(±3)	14(±1)
Maximum	15	16	15
Minimum	8	8	13
Animal density (cm^2/rabbit)			
Average (±SD)	235(±53)	349(±83)	577(±140)
Maximum	303	600	667
Minimum	179	240	415

approximately 15 multi-floor cages roller stands. None of the hauliers mixed rabbits with other animal species in the same trip. The average speed was 72.8 km per hour, with a maximum of 90 km/h and a minimum of 50 km/h. The lorry floor was made of steel in 33.3 % of the cases and very rarely covered by litter. The roof and walls were made of different materials, but normally aluminium (23.8 %) and steel (14.3 %). Almost half of the trucks had an insulated roof. In most of the lorries (76.2 %), the environmental conditions during transport were not controlled, lacking artificial light, mechanical ventilation or temperature control. During transport, almost all hauliers reported that the noise levels were low (76.4 %) and that air quality was good (95.3 %).

The most common transport procedure was to load one truck with animals from different farms. Every day the abattoir defined a road map schedule to be followed by the hauler. Empty cages were dropped at each farm on the journey out to the farms and picked up on the way back to the abattoir.

The average journey involved 2029 animals (range 400-5460). The mean transport time was 154 min (see Table 2) and most journeys were in the morning (66.7 %). The average number of kilometres travelled was 137.50 km, so the number of rest stops was normally zero (61.9 %) or one (14.3 %). Apart from these rest stops, drivers stopped at different farms an average of 2-3 times per journey to load animals. Each cage was identified according to the farm and lot. At the abattoir, animals were unloaded almost immediately (the average waiting time before unloading was 4.5 min).

Unloading

Animals were normally unloaded in the morning (55 %) and this procedure lasted an average of 23 ± 15 min. Nearly all the abattoirs (85 %) unloaded the cages in groups or cages stands. The unloading point was covered and protected from the wind in about 80 % of the abattoirs. The holding area was also covered and half of the areas surveyed had an air ventilation system. Veterinary inspections took place at all the abattoirs during unloading.

Table 2: Percentage of hauliers, mean stops, average duration of transport, and the average journey distance for each category of transport time.

	Transport times classes		
	<30 min	30 min to 180 min	>180 min
% of Hauliers	14	62	19
Journey Stops			
Average (±SD)	2	3.2(±1.2)	2.8 (±1.0)
Maximum	2	5	4
Minimum	2	1	2
Journey Time (min)			
Average (±SD)	27 (±6)	129 (±51)	330 (±180)
Maximum	30	180	600
Minimum	20	60	240
Journey Distance (km)			
Average (±SD)	38 (±18)	128 (±87)	350 (±212)
Maximum	50	300	500
Minimum	25	20	200

Holding area

Before slaughter there is a short lairage time where animals are kept in the same multi-floor transport cages in a holding area near the stunning facilities. About 80 % of the abattoirs surveyed used multi-floor cages during this period with an average capacity at the holding area for 250 (range 45 to 1500). Only one abattoir used specific lairage cages for the rabbits in the hold area (i.e., rabbits were transferred from the transport cage to a lairage cage).

The average waiting time before slaughter was 110±113 min (range 0 to 420 minutes). Only one abattoir had facilities to provide food and water to the animals under long holding periods. This is considered good practice as having water available

reduces live weight and carcass losses associated with ante mortem handling (Coppings *et al*., 1989). The ambient conditions in most cases were both natural and artificial (i.e., not totally closed areas with ventilation devices), and only three abattoirs had a temperature control device. One abattoir showered the animals in summer before slaughter to cool down the animals. Noise levels were reported to be low in the holding area, although some abattoirs cleaned empty cages nearby, significantly increasing the noise level.

Slaughter

The throughput of the different abattoirs varied from 500 to 400.000 animals/ week. The most common (20 %) was 30.000 animals/week.

Animals were removed from the cages by hand and taken to the stunning device, normally by the stun operator (65 %). The mean time between stunning and sticking was 7.8± 6.5 seconds. The maximum average time permitted by the managers was 15.3 ± 9.0 seconds. Then the animals were hung upside down vertically by the hind legs to bleed.

The time from stunning to chilling was around 15 min. In many abattoirs the carcasses went through a chilling tunnel to be pre-chilled before entering the cold room, a process called "oreo". About 45 % of the abattoirs used performed the "oreo" (mean duration 80± 38 minutes). After pre-chilling, most carcasses remained in the cold room for at least 4 hours. The carcasses were normally kept from 4 to 24 hours (80 % of the abattoirs) but sometimes for more than 24 hours (2 abattoirs), which depended on the meat buyers.

A possible critical aspect during this stage is that many slaughterhouses take the rabbits to be slaughtered directly from the transport cage tower. Towers are moved from the waiting area and located very close to the stunning point so most rabbits can see, hear and smell the animals which are slaughtered at a close distance. This point could be an additional stressor to the animals because there is some evidences that animals can smell pheromones associated with the slaughter stress

which could increase fear before slaughter.

Only two abattoirs measured temperature of carcasses and bruising before chilling, and eight measured ultimate pH. These measurements were taken to measure meat quality, not the welfare of the animals.

DISCUSSION

All transportation is undoubtedly, for the animals, a stressful experience. Every precaution should be taken by farmers and hauliers to avoid unnecessary suffering through inadequate ventilation, exposure to extreme temperatures, lack of feed and water, long delays, etc. All the personnel should be properly informed about the transport details and documents to ensure quick handling and reception at the destination.

One of the problems with measuring the adverse effects of transport is that most of the animals transported to slaughter are perfectly healthy, relatively young and resilient to disease or stress. It is not always apparent to what extent their welfare may not be compromised nor what level of physiological or behavioural change represents a welfare risk (Barnett and Hemsworth, 1990).

There are wide varieties of stressors that affect animal welfare and they differ between regions or even farms. A short list of the stressors during transport includes heat, inanition, dehydration, pain and trauma, cold, motion sickness and fear (Gregory 1998). According to our results, all or only some of these factors may affect animals.

In this study, the critical points during transport process were waiting time at the farm before loading, loading, ventilation and temperature during transport (cage position), loading stops, unloading, holding time before slaughter, environmental conditions during holding and time between stunning and bleeding. In general, the

transport conditions seem to be more important than the time of the journey (María *et al.*, 2004).

Loading is a critical point that is well understood by the farmers. The main problem during loading was the large variation in animal density per cage. This could be due to differences between cage size and the number of animals loaded per cage, which was uniform.According to the long farm waiting time, animal density should be low (in the Ministry of Agriculture, Fisheries and Food Recommendations 1987, the minimum floor space for 12 week old rabbits should be 1800 cm^2). The waiting time at the farm, as the abattoir road map indicates, was sometimes longer than the transport itself. Hence, in a continental climate animals located in multi-floor systems with long waiting periods are exposed to stress. Therefore, we suggest a low stocking density as good practice. Due to the lack of regulations in Spain for the space per rabbit or height of the cage during transport, this kind of suggestion could not be more than a recommendation.

As mentioned above, the main critical points during transport were the transport conditions, especially related to environmental conditions within the truck (Animal Welfare Institute, 2004). This fact is more important in rabbits than in other species because they are loaded in multi floor cage stands. Special care should be taken in summer since rabbit stress increases significantly (De la Fuente *et al.*, 2004). The cage position within the multi system stand could also affect their welfare (Maria *et al.*, unpublished data). The logistics used while loading commercial rabbits (including several stops) can greatly increase the journey time. Therefore, transport details could be considered a critical point that is difficult to solve.

The absence of specific training for hauliers could also be a critical point. Currently the situation is changing because the Spanish authorities and driver organizations are offering animal welfare training programs.

All the abattoirs surveyed used unloading device systems (i.e. hydraulic ramp) so the animals were usually unloaded quickly. The environmental conditions at the

unloading should be taken into account as a critical point. Some of the abattoirs did not have covered areas with a wind protector at the unloading site, which is necessary to preserve animal welfare and avoid extreme changes in temperature (e.g., in winter).

Two main critical points at the holding area are the holding time and the climatic conditions. To optimize welfare it is necessary to control the environmental conditions within the thermo-neutral zone for rabbits (Animal Welfare Institute, 2004). Transport has been shown to affect meat in rabbits (Jolley, 1990), so a minimum lairage time is necessary for the animals to recover from the stress response caused by transport.

The unconscious state ("down time") before bleeding is considered the last critical point in the slaughter process. The animal must be slaughtered within 35 seconds after stunning before recovering consciousness. In fact the return of rhythmic breathing occurs between 26 and 33 seconds after stunning (María *et al.*, 2001).

The rabbit transport system in Spain, in relation to meat quality, seems to work well, which is partly demonstrated by the low incidence of low quality meats in Spain (Sañudo, personal communication). Although organisation between farmers, hauliers and abattoirs seem to work smoothly, systematic planning could be improved to facilitate the process. Efforts are needed to implement and improve training courses for the people involved in all aspects of animal handling.

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