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Unloading or not unloading? Sheep welfare implication of rest stop at control post after a 29 h transport

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ABSTRACT

In Europe, maximum journey time for transported sheep is set at 29 h (EC Regulation 1/2005), after which animals must be unloaded, fed and watered in control posts stopping for 24 h, as all other species, before continuing their journey. The industry considers these resting times too general, not taking into account the peculiar differences between species or age classes. Also, loading and unloading have been reported to be detrimental for the animals. Therefore, the industry pushes to reduce the times at control post and avoid unloading the animals from the truck. Since there is little information concerning the effect of resting in a stationary truck after long journeys, the present study aims to evaluate the effect of an 8 h rest stop on the truck for transported ewes compared to being unloaded for resting in a control post for the same amount of time, considering physiological and behavioural measures. Two groups of ewes were transported for 29 h, after which one was unloaded and housed in a pen (P) at the control post while the other was left inside the truck (T). After 8 h stop, a further 6 h travel was headed to the farm of origin. A third group (C) stayed at the farm as control. During the stop, standing, resting, moving and eating behaviour of all groups was recorded. Blood parameters, salivary and faecal cortisol were assessed at different stages. The behaviour of P animals during the resting period was more similar to C than to T ones, where feeding and lying behaviours were restricted by the limited space allowance on the truck. After returning to the farm of origin, both T and P animals showed different parameters' levels as compared to C. P ewes showed a mean loss weight of 2 kg not recorded in group T and showed higher signs of muscular damage compared to C group. It was concluded that, with so short resting times as 8 h, there is no clear advantages in terms of animal welfare for avoiding the unloading and loading of the animals in the control post after long journeys.

1. Introduction

Livestock transportation is an unavoidable phase in farm production, with all animals travelling at least once in their life (Harris, 2001). The increase of cross-border transportation within the European Union (EU) due to the communitarian market (Hop et al., 2013) and the decreasing number of small slaughterhouses has influenced transport logistic, leading to an inevitable increase in journey length. There are many different components of transport that can have an impact on the animals (e.g. confinement, space allowance, road type, driving practices, vehicle type, pen size and construction) (Broom, 2005), some of which might be exacerbated by long journeys (Gavinelli et al., 2008). The main transports' adverse effects on sheep welfare are considered dehydration, muscular damage, thermal and physical discomfort, and behavioural restrictions (Cockram et al., 1996).

The EC Regulation 1/2005 (European Council, 2004), issued to protect animal welfare during transportation, includes special provisions for long journeys (defined as travels lasting more than 8 h). Adult sheep, after travelling for 29 h (14 h travel plus 1 h rest on the truck plus 14 h travel) must be unloaded, fed and watered in control posts for at least 24 h before continuing their journey. Control posts are places where animals are unloaded, fed and watered after the journey time laid down (i.e. during long journey travels), and where they shall be rested for at least 24 h. All these facilities are controlled by an official veterinarian and approved by the competent authority, that shall guarantee minimum standards for their structures and management, as specified in the dedicated EC Regulation

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(European Council, 1997). Concerning sheep, most animals across the EU are travelling over long distances (about 60% of the overall), but only a small portion of them (5%) are transported for more than 29 h, then requiring the use of control posts (Gebresenbet et al., 2010). Previous studies on stop duration in sheep during travel provided divergent results. Knowles et al. (1996) kept lambs at control post with concentrates, hay and water available for 8 h after a 24 h journey. After a further 10 h of transport, lambs were in a better state of recovery than they had been at the end of the first transport. In these circumstances, the 8 h rest was sufficient to provide a substantial recovery of the animals. Liu et al. (2012) suggested that resting period of 6-12 h with feed and water was recommended for allowing lambs to accommodate to a new environment and recover their homeostasis after an 8 h journey. Shorter resting periods seem to be detrimental rather than beneficial for lambs (Cockram et al., 1997), even if Miranda-de la Lama et al. (2012) found that, in lamb transport, a logistic stopover system of 1 h was less stressful than a direct transportation. Aside from stop duration, the need for unloading animals to rest at control post is questioned by the industry. In fact, the potential risk of increased incidence of disease resulting from the exposure to a greater number of unfamiliar animals during off-trailer rest periods could be problematic (Krawczel et al., 2008). The risk associated to unloading procedures for resting the animals in control post facilities is also a matter of concern when studying the effects of long distance travels on animal welfare (Fisher et al., 2009). Indeed, it is reported that loading and unloading procedures are the most stressful parts of the travel for sheep (Knowles et al., 1995; Nielsen et al., 2011), and that the exposure of the animals to a novel lairage environment might have detrimental effects on their welfare (Cockram et al., 2000). It can be expected that the adverse effects of stress, provoked by the unloading and loading, and the challenge of coping with a new environment, increase as the resting time is reduced. Lastly, the vast majority of studies on ovine transport involves lambs (Knowles et al., 1996; Cockram et al., 1997; Parrott et al., 1998; Krawczel et al., 2007). Nevertheless, since it has been observed that different ages of sheep differ in the response to transportation (Napolitano et al., 1995; Zhong et al., 2011), it is important to expand the knowledge on adult sheep as well.

The present study aimed at evaluating if an 8 h rest stop on the truck, not implying unloading and loading procedures, is less detrimental for transported ewes' welfare compared to being unloaded and rest in a control post for the same amount of time. We hypothesised that the absence of stressful management practices during the stop at control post, as loading–unloading and resting in a novel environment, would play a role in reducing the overall transport stress in sheep not being rested on truck as compared to the ones unloaded at the control post. The investigation on the effect of different management practices during stopover during long transport journey on the welfare of adult ewes contributes to bridge a gap of knowledge on sheep transport, that has a trading relevance in the EU (Knowles, 1998).

2. Material and methods

2.1. Animals

Seventy-two Comisana adult ewes (age ranging between 2 and 6 years), an Italian dairy breed, were used in this study. All animals came from the same farm, placed in the Apulia region, in the south of Italy (41°7′0″N, 16°29′0″E). Sheep were normally grazing extensively during summer and housed in outside pens during winter. Before the beginning of the trial, all animals were dried and housed in a single indoor pen for five days, since this was reported to reduce the stress of transport compared to loading sheep on a truck directly from pasture (Cockram et al., 2000).

2.2. Experimental procedure

The trial was divided in four phases: pre-transport period (grouping and baseline values sampling), transport period (29 h journey without unloading from the truck), control post period (8 h), and after-transport period (return to the farm of origin after an additional transport of 6 h). Fig. 1 reports the overall experimental and sampling design.

Three days before the beginning of the trial, sheep were assigned to one of two experimental groups or to the control group. Groups were homogeneous for number (24 subjects) and weight (41.6 ± 11.4 kg). Each group was housed in adjacent pens of 48.7 m^2 (2.03 m^2 per animal) with access to water and food. Sheep were individually numbered, using animal marker spray, with different colours for each group. This allowed identification at both group and animal level. None of the animals had previous experience of truck transport nor were they familiar with the vehicle, loading or unloading procedures.

At 8:00 am of the third day after grouping, the two experimental groups were loaded on the lower deck of the truck with straw as bedding material, whereas the control group (C) remained at the farm for the whole trial. The truck was a semi-trailer vehicle, authorised for long journeys. A portion of the deck was divided in two compartments of 6.5 m^2 in mean area (0.27 m^2 per animal, in compliance with EC Regulation 1/2005 provisions). Water (through nipple drinkers, one every 3 animals) was available for the whole journey in both compartments. Ewes had access to feed until the beginning of loading procedures, but additional feed was not provided during travel. The animals were transported for 29 h (long transport, hereafter LT) until reaching, on day 4 at 13:00 pm, the control post (authorisation CE 07/PS; 41°2′27″N, 16°50′9″E), located in Bitritto (Bari). The total travelled distance was 1.599 km, covered driving mainly on national highways at an average speed of 70 km/h. At arrival at the control post, one group (Pen, P) of animals was unloaded and housed in one pen (50 m^2, 2.1 m^2/animal). Unloading was performed by unfamiliar handlers and in a new environment, similarly to what happens in normal commercial practice. The other group (Truck, T) remained on the truck, that was parked in a shaded area, in the same compartment where it travelled during the journey. During the stop (8 h) both groups were fed (clover and oats hay and 400 g of concentrate feed) and watered through buckets (one every 12 animals). In order to allow a stop duration being shorter than what is foreseen by the law (8 h instead of the required 24 h), a licence for experimental purposes was issued by the Italian Ministry of Health (Ministerial Decree no. 166/2011-B), after the positive evaluation by the Istituto Superiore della Sanità Ethical Committee. After the resting time, group P was reloaded on the truck and both groups were transported for a further 6 h journey (short transport, hereafter ST) until the final unloading at the farm of origin (360 km drive). Each of the loading/unloading operation took on average less than 10 min. The experiment was carried out in October. Weather conditions were mild, with no rain nor strong wind during the whole trial, and external temperature ranged from 32.5 °C to 12.5 °C. The day of transport THI index was 61.8, calculated by day temperature and humidity in the whole trial area. Internal temperature on the truck was 21.2° ± 4 °C during transport, while during the resting time at control post was 20.9° ± 2 °C outside the truck and 23° inside it.

2.3. Sampling procedure and sample processing

Biological samples were taken from all animals at different times. Saliva and then blood samples were collected 4 times: (t0)