



Analysis of control data relating to the transport of lambs provided by the NGO Animal Welfare Foundation

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Introduction

The Non-Governmental Organisation Animal Welfare Foundation e.V. (AWF), has provided me with data concerning obvious welfare issues in long-distance transport of lambs.

According to AWF's representative, the material was evaluated from trailing and inspecting 20 from a pool of dozens long-distance transports of weaned and unweaned lambs which took place from 2016 to 2021.

Findings

The NGO stated: *"In this summary, only the results of trucks thoroughly inspected were used for the final analysis of animal-welfare base indicators during transportation. Inspection times varied from truck to truck, with times affected by the availability of the drivers to let our teams inspect their trucks. It is important to add that only the first deck compartments were inspected, due to it being impossible for our teams to inspect the upper decks."*

All statistics are related with number of inspected consignments. In each consignment the number of lambs is between 520-850."

The findings show infringements of the relevant law [Reg. (EC) No1/2005] as well as peculiarities directly linked to the compromised wellbeing of the animals (animal-based indicators for impeded welfare = animal-based material = ABM).

The specifics are listed and assigned in Table 1, as well as the frequency of the findings relating to the respective consignments.

LAMBS			
Animal-based indicators			
		Observed in ... consignments [percentage, number]	Estimation of animals concerned
1	Vocalisation	85% (17 out of 20)	Most of the animals
2	Licking or biting metal bars or wall of the vehicle	85% (17 out of 20)	Most of the animals
3	Lethargy	30% (6 out of 20)	Lethargy signifies mental and physical exhaustion, e.g., a lamb lying down and not moving, showing no interest in surroundings, but at the same time showing no visual sign of injury or upper respiratory tract infection
4	Morbidity	30% (6 out of 20)	Morbidity is any significant sign of a disease, e.g. runny nose and eyes, which was observed visually.
5	Mortality	10% (2 out of 20)	
Infringements			

		Observed in ... consignments [percentage, number]	Commentary of AWF
1	Temperature exceeding the thresholds	20% (4 out of 20)	High probability; below 0°C (-1 to -12°C)
		15% (3 out of 20)	above 30°C
2	Drinkers inadequate	100% (20 out of 20)	No consignment has adequate drinkers
3	Suspicion of the presence of unweaned animals treated as weaned	15% (3 out of 20)	Criteria: - < 6 weeks old (5). - When lambs look visually small (<18 kg) they raise suspicion that they are unweaned (6).
4	Separation of animals: Animals of different sizes, ages	95% (19 out of 20)	
5	Travelling time exceeded the maximum allowed	35% (7 out of 20)	Exceeded the legislative limits the time limits are also related to lack of stopping for feeding after 9 or 14 hrs
6	Inadequate vehicle: risk of injuries	65% (13 out of 20)	Gaps where lambs can get trapped (article 3 icw. ann. I, ch. II, 1.1. (a) of Reg(EC)1/2005) ???
	animals stuck with their extremities	20% (4 out of 20)	
7	Partitions inadequate	75% (12 out of 16)	
8	Head Height inadequate	90% (18 out of 20) 94% of these 18 consignments body parts had contacts to the ceiling	
9	Space Allowances	A. Inadequate loading density was measured in 90% (18 out of 20) of the consignments	
		B. In at least 44% (8 out of 18*) of the consignments measured space available for one animal was less than 0,18m ² * Number of consignments where space allowance calculations were possible to obtain.	
10	Bedding insufficient	30% (6 out of 20)	
11	Unfit	35% (7 out of 20)	animals unfit to continue the journey detected

The Analysis

There are a number of hazards that threaten the lives and welfare of animals during transport. VAN REENEN et al. (2008) list hazard for lambs: Inadequate ventilation; insufficient air velocity; insufficient air quality; insufficient space allowance; slippery floors; inappropriate bedding material; transport duration: The welfare of lambs younger than 4 months was assumed to be threatened beyond a transport duration of 4 hours; lack of (appropriate) food and water during long distance transports; poor fitness and health status prior to transport; introduction of pathogens before and during transport; lack of organisation, planning and control; inappropriate application of resting periods during transport. The presence of these hazards might lead to infringements of the law.

Apart from environmental conditions COLLINS et al. (2018) found two important factors that influence the welfare of transported animals: the characteristics of the vehicle itself, esp. ventilation system, suspension and flooring, and the way the vehicle is driven.

The following analysis of data provided by AWF starts with the assessment of infringements and postpones ABM's. The reason is the assumption of a better methodology that describes how legal

requirements are broken and how these infringements impact on the animals' condition and behaviour. The other way of describing indicators and then searching for possible causes is considered to be more laborious and less specific.

Infringements

1. Temperature

Findings:

"In 20% (4 out of 20) of the consignments there was a high probability that legislative limits were exceeded (EC 1/2005) by carrying lambs when the outside temperature was below 0° (in a range -1 up to -12).

**It was snowing and windy" (Wording by AWF)*

"In 15% (3 out of 20) of the consignments, the temperature inside the vehicle exceeded 30° C

(Note: the temperature was not checked at all stages of the journey, therefore there may be more consignments than those mentioned that could exceed the limits)" (Wording by AWF)

Assessment:

According to Ann. I, Ch. VI, 3.1. the ventilation systems on means of transport by road shall be designed, constructed, and maintained in such way that, at any time during the journey and whether the means of transports are stationary or moving, they must be capable of maintaining a temperature range of between 5°C and 30°C within the means of transport, for all animals, with a +/- 5°C tolerance, depending on the outside temperature. This is statutory law.

Unweaned animals, lambs as well as calves, are very susceptible to extreme temperatures that can be manifested by heat or cold stress. Thermal stress will start to appear when the climatic conditions are such that the temperature regulation of the animals cannot be achieved by non-evaporative physical processes alone or without thermogenesis (AGGARWAL and UPADHYAY, 2013). Thermoneutral zones – this is a range of ambient temperatures in which animals can maintain their internal temperatures with minimal metabolic regulation. In young animals it varies with age, weight, environmental conditions, and other stressors. According to the Commission (COM, 2009b) the *"Transport of unweaned animals over long journeys should not be authorised if the outside temperature during the journey is likely to be below 0°C"*. This is not statutory law.

The recommended temperature range that must be maintained for sheep is from a minimum of 0°C for full fleeced sheep, 10°C in shorn sheep, a maximum of 28 °C / 30°C (full fleeced / shorn sheep) when the relative humidity is below 80 %, and 25°C / 29°C (full fleeced / shorn sheep) when the relative humidity is higher than 80 % (ANIMALTRANSPORTGUIDES, 2017).

The combined effects of air temperature and humidity associated with the level of thermal stress can be shown by using the temperature-humidity index (THI), which is a useful and easy way to assess the risk of heat stress. Increases in the THI that could be detrimental to the welfare of sheep could occur on stationary sheep transport vehicles given most

daytime ambient temperatures during summer. For a given stocking density and vehicle design, the THI of a pen increased in proportion to the duration of the stationary period (FISHER et al., 2005).

According to the Commission (COM, 2021) „it is not in the position to uphold the blanket-wide recommendation, made in 2009“, whereas „it is the responsibility of the journey organiser and of the Member State of departure to ensure that the vehicle selected for such a journey can comply with the requirements of Regulation (EC) No 1/2005. This includes the requirement set out in Annex I, Chapter VI, Paragraph 3.1 of Regulation (EC) No 1/2005 and that the vehicle has suitable drinking equipment that is able to provide adequate liquids to unweaned animals even in temperatures below 0°C.“ The fact is that fully airconditioned vehicles for the transport of unweaned animals are not yet available with drinking equipment that is able to provide adequate liquids to unweaned animals even in temperatures below 0°C, especially not for the scale in which these animals are transported within the union. Additionally, it will be shown below that there is no adequate drinking equipment available at all that would fulfil the behavioural and physiological needs of unweaned animals, in particular the need to be fed milk or milk substitutes during transport and on board the vehicles.

It is very likely that there are no significant differences between temperatures inside and outside the trucks.

When the lower physiological threshold of ambient temperature is undershot – leading for example to shivering to maintain body temperature – as well as when the higher physiological threshold is overshot – leading for example to panting to maintain body temperature –, it must be emphasised that the nutrient requirements of unweaned animals increases significantly. The correct supply of liquids is extremely questionable, and not at all possible with liquid feed, as shown below.

Ambient temperatures during transport that are either too low or too high are intense stressors to the most vulnerable unweaned animals.

2. Drinkers

Findings:

“Inadequate drinking devices for lambs were measured in 100% (20 out of 20) of the consignments” (Wording by AWF)

Assessment:

AWF observed that not even one of the consignments had compliant drinking devices.

Drinkers must be designed, allocated and positioned to allow access by the animals. Drinkers should be of a design that animals are familiar with and positioned in such a way that they allow a normal drinking posture. Nonetheless sheep may not drink water at all from unfamiliar sources in unfamiliar environments (EFSA, 2011). Even if they could drink, sheep did not drink during transportation in the same way they did before transport (DALMAU et al., 2014).

Sheep and weaned lambs need bowl drinkers or troughs with a free water surface whereas unweaned lambs need deformable (= flexible) suction nipples:

Unweaned animals are only accustomed to teats, artificial rubber teats, or teats made of another malleable material which allow them to suck naturally. Once they are placed in a vehicle, whether the vehicle be moving or stationary, they will not be able to become accustomed to metal nipples or nipples made of hard material, or other drinking devices they are unused to, such as drinking basins with open water surfaces. That is described in detail using the example of calves (HERZOG et al., 2019; MARAHRENS and SCHRADER, 2020, RABITSCH, 2020; RABITSCH and MARAHRENS 2020, 2021).

The Consortium of the Animal Transport Guides Project writes in its leaflet “Sheep on long journeys (ANIMALTRANSPORTGUIDES, 2017): *“Take special care for unweaned lambs! These animals are young and need specific care. They need hands-on assistance of each individual animal (no metal nipples or troughs) and the liquid feeding should have the correct temperature and solution strength, to avoid digestive problems.”*

Confronting lambs with drinking devices they do not know for the first time after loading is contrary to Reg. (EC) No. 1/2005 which stipulates *„Due regard shall be paid to the need of certain categories of animals [...] to become acclimatised to the mode of transport prior to the proposed journey“* (Ann I, Chap III, 1.1.) as well as *„to the need of animals to become accustomed to the mode of feeding and watering“* (Ann I, Chap III, 2.7.).

It was the Commission, who had already stated in 2009 (COM, 2009b), that

- *„metal nipple or bowl drinkers alone should be considered unsuitable for watering unweaned animals. Only vehicles equipped with buckets and deformable suction nipples should be considered fit for purpose“* and
- *„before or during transport, the competent authority should systematically investigate what arrangements have been made to ensure that the animals receive electrolyte solutions or milk substitutes during rest periods“.*

However, if lambs succeed getting liquids from metal nipples, they do it to a limited extent, often in uncontrollable amounts, and not all of them are able to get any.

It should be noted that all these lorries, with non-adequate drinkers, hold a Certificate of approval of means of transport by road for long journeys pursuant to Article 18 (2) issued by a Veterinary Office. This is despite of the given deficiencies related to Art. 3 (a) and (h), Ann. I, Ch. III, 2.7., Ch. V, 1.4. (a) and Ch. VI, 1.3. and 1.4. It should also be noted that all these trucks with unsuitable drinkers on board are repeatedly loaded with, and transport, unweaned animals and always with clearance from the veterinary offices.

These shortcomings were repeatedly found by missions of the Food and Veterinary Office (FVO), e.g., in DG(SANTE) 2017-6107 (2009, 2017a) or DG(SANTÉ) 2017-6108 (COM, 2017b): *“Vehicle approval certificates issued indicate species but not categories of animals, contrary to what is required by Chapter IV Annex III of Reg (EC)No1/2005. Therefore, unweaned animals may be transported on vehicles that are inadequate for this category of animal, with the biggest risk being their inability to access liquids due to unsuitable drinking devices“.*

Beyond that, only water or, at the most, electrolyte drinks are offered. Currently it is not possible to provide unweaned animals with a suitable feed substitute drink on board that is adequate for their demands (cf. EFSA, 2008; COM, 2009b).

From the multiple findings in the transport of unweaned calves (ANIMALTRANSPORTGUIDES, 2018; MARAHRENS and SCHRADER, 2020; RABITSCH 2020); RABITSCH and MARAHRENS, 2020, 2021) it is evident that unweaned animals in

general cannot be fed on board the trucks at all, meaning that they cannot get liquid food (milk, milk substitute).

The reason for it being impossible to supply liquid food aboard originates from the above-mentioned inadequate drinkers and also from the inability to generate a milk substitute liquid, that is lump-free and body temperature, from the dry powder-substrate. Even if it were possible to produce a suitable liquid feed, then it would have to be administered individually according to the needs of the respective animals, here: lambs, which are transported in several compartments on (3 or) 4 layers of a semitrailer.

It is evident that it is impossible to feed unweaned animals on board the vehicles. The drivers might not even stop but continue driving, or they may stop without switching on the water source, or they may stop and switch on the water source without paying attention to a possible intake of liquids.

When unweaned lambs are not fed liquid feeds during transport, they would get their next liquid meal, at the earliest, within 1 hour after arriving at their destination, meaning a withdrawal time of nourishment of at least 20 hours, unless – and this is the worst scenario – they are considered weaned at the moment of loading.

The longer the withdrawal of food lasts the more the animals suffer. Modest bodily discomfort usually develops gradually and increases as time goes on. Occasionally however, the discomfort increases quickly, with extremely unpleasant and then life-threatening sensations. The animals suffer from the impact of the withdrawal of feed which goes against their natural self-preservation instinct and also from their surroundings which they perceive to be life-threatening (BERNATZKY, 1997). This suffering can only be stopped by satisfying all needs of the animals including satisfying their hunger and thirst by feeding and watering them.

The demand for food must be fulfilled in accordance with the requirements of Art. 3 (a), (f) 2. half-sentence and (h) of Reg (EC) No 1/2005 in conjunction with Ann. I, Chap. V, 1.4. a) (cit: “fed, if necessary”); there is a need to feed unweaned lambs after 9 hours of travelling. Otherwise, the intervals of feeding would be far beyond the physiologically maximum acceptable 12 hours. Just providing drink and not feed will lead to unjustifiable and avoidable suffering in unweaned lambs, which is clearly an offence against Art. 3 of Reg (EC) No 1/2005 stipulating „No person shall transport animals or cause animals to be transported in a way likely to cause injury or undue suffering to them“.

3. Suspicion of the presence of unweaned animals being treated as weaned

Findings:

„Animals wrongly categorized were detected in 15% (3 out of 20) of the consignments (unweaned have been considered as weaned)“ (Wording by AWF)

Assessment:

In 2009 the European Commission wrote to the ambassadors of the Member states: “From a practical point of view, calves under two months and lambs under 6 weeks could be considered unweaned.”

Restricted milk intake before weaning at 5 weeks of age causes a prolonged growth reduction followed by no compensatory growth (GEENTY, 1980).

AWF found individual animals, on trucks transporting lambs for 29 hours, that appeared to be too young or too small to have already been weaned. They are unfit for transport that exceeds 19 hours. In 3 out of 20 inspected consignments there was found to be a mix of ages and categories of animals which shows a common problem in lamb transports. 15 % may appear a random, perhaps even negligible quantity, but it shows systemic failure.

This mixture of weaned and unweaned lambs means that the latter do not receive any liquid feed and probably not sufficient liquids at all which results in them suffering hunger and thirst. Additionally, other problems might occur because of the different behavioural patterns of unweaned animals towards other living beings and due to their typically small body size.

Mixing unweaned lambs in with a group of weaned lambs and transporting the whole flock under conditions of adult ruminants, [1.4. (d) of Ch. V of Ann. I of Reg (EC) No 1/2005] sheds a light on the poor quality of checks. According to Art. 14 leg. cit., the consignment must only be cleared in the case of compliance with this Regulation.

4. Separation of animals - Animals of different sizes, ages

Findings:

„Animals of different size were mixed in 95% (19 out of 20) of the measured consignments*

** Age-related size” (Wording by AWF)*

Assessment:

According to Ann. I, Ch. III, 1.12. animals shall be handled and transported separately i.e., if they are of significantly different sizes or ages. This paragraph shall not apply where the animals have been raised in compatible groups, are accustomed to each other and where separation will cause distress.

Irrespective of the quoted exemptions, not separating animals of different sizes might lead to injuries to the physically smaller or weaker lambs, especially in the case when animals lose their stance on sharp bends and during sudden accelerations or sudden stops. Apart from that, smaller and weaker lambs could be restricted from accessing resources like feed and water. Smaller animals are also more likely to get caught in gaps while on board the lorry compared to their larger counterparts.

5. Travelling time

Findings:

„In at least 35% (7 out of 20) of the consignments, travelling times exceeded the legislative limits

**The time limits are also related to lack of stops for feeding after 9 or 14 hours” (Wording by AWF)*

Assessment:

AWF observed consignments

- with weaned lambs on board
 - o which did not stop for a pause after 14 hours of travel

- which continued the trip after 29 hours of travel though Ann. I, Ch. V 1.8. did not apply.
- with unweaned lambs on board
 - which did not stop for a pause after 9 hours of travel
 - which continued the trip after 19 hours of travel though Ann. I, Ch. V 1.8. did not apply.

While it is evident that it is impossible to feed non-weaned animals on board the vehicles, the drivers might not even stop to rest the animals but continue driving with no regard to the needs of the animals.

The maximum allowed transport times due to Ann. I, Ch. V. must be strictly followed because *“Long journeys are likely to have more detrimental effects on the welfare of animals than short ones”* [Recital (18) of Reg (EC) No 1/2005] and therefore *“the transport of animals over long journeys, including animals for slaughter, should be limited as far as possible”* [Recital (5) of Reg(CE)1/2005].

Sheep and lambs can only compensate for the stress associated with each transport for a limited time and suffer afterwards (HIRT et al., 2016). The longer the transport lasts the more symptoms of fatigue, exsiccosis and exhaustion will arise.

According to Ann. I, Ch. V, 1.5. of Reg(CE)No1/2005, animals must be unloaded, fed and watered and be rested for at least 24 hours after the maximum journey time laid down. In fact, they have to be unloaded before the maximum journey time is reached, whereas the time spent for unloading (and loading respectively) is part of the journey time (COM, 2007a, b, 2020; MAISACK and RABITSCH, 2019a, b; RABITSCH et al. 2020). The 24-hour rest period is a scientifically based and politically ruled time for rest and recreation for animals and cannot be overruled by individual decisions. It starts when the last animal of a consignment is unloaded and ends, when the first animal starts to be reloaded.

Additionally, a specific problem in sheep is the fact that even 24-hour rest period will not eliminate transport stress or signs of immunosuppression, even though it is sufficient to ensure adequate drinking and resting behaviour (EFSA, 2011). Signs of stress are detectable in lambs transported for 24 h (DALMAU et al., 2014).

Very often the transport of animals is calculated with unrealistic maximum and average velocities for the heavy trucks which are used to move them (RABITSCH and WESSELY, 2012a, b; RABITSCH et al., 2020). Sometimes it is virtually impossible to move them from place A to place B within the given time limits. Nonetheless it seems that economic pressures on transporters, as well as on ministries' representatives, are the driving force to challenge a bending of the law. Thus, animals are transported neglecting basic principles (*“The loading and the unloading has to be included in transport times”*) of the animal transport law (CURIA, 2007; COM, 2007a, b, 2020; MAISACK and RABITSCH, 2019a, b, RABITSCH et al., 2020). Moreover, some authorities need to be authorized to include an extra 2 hours in the planning of routes, which in fact is already allowed – according to Ann. I, Ch. V, 1.8. – only in the case of materializing of unforeseen and unforeseeable contingencies.

Transportation for longer than the legislative limits of maximum journey times permit means that the lambs have to face a still longer period where they cannot be supplied with water and, in the case of unweaned lambs, also with feed.

6. Inadequate vehicle: risk of injuries

Findings:

“In 65% (13 out of 20) of consignments the vehicles were inadequate leading to the risk of injuries, for example gaps between floor/side wall, loose dividers, rusty elements and sharp edges all of which were observed.” (Wording by AWF)

“In 20 % (4 out of 20) we observed animals that were stuck with their extremities and therefore unable to move and reach the water device and feed because the animals could not move or stand up in order to take their feeding position” (Wording by AWF)

Assessment:

A

“In 65% (13 out of 20) of consignments inadequate vehicles lead to the risk of injuries such as: gaps between floor/side wall, loose dividers, rusty elements or sharp edges were observed.” (Wording by AWF)

Theoretically there might be a big variety of deficits aboard a means of animal transport that threatens the well-being of the living asset. In order to prevent these risks to life and limb of the transported animals, COUNCIL REGULATION (EC) No 1/2005 on the protection of animals during transport and related operations was adopted. Especially Art. 3 (c) and (d) [“*the means of transport ... (and) the loading and unloading facilities are designed, constructed, maintained and operated so as to avoid injury and suffering and ensure the safety of the animals*”], the obligation to inspect a means of animal transport that is to travel by road, prior to granting the certificate of approval (Art. 18), the checks acc. to Art. 14 ... are to be carried out by the competent authority before long journeys are cleared. The technical rules of Annex I and, last but not least, the training of persons in charge of the animals acc. to Art. 17 and Ann. IV leg. cit. should make it impossible for there to be the abovementioned risks.

The findings of AWF, which are evidenced by documentation, pictures, and footage, prove the opposite. It is stunning that there are gaps between the lifting floors and the side walls of the trucks, loose dividers, rusty elements, and sharp edges all of which were recorded in the vast majority of observations of lamb transports (65 % of the consignments).

It must be taken into account that the situation described is not a fleeting snapshot, it is also the own experience of the undersigned. I have witnessed lambs being loaded again and again onto the very same trucks with the very same gaps, misconstructions, and poor maintenance (RABITSCH, 2014). This happens with the knowledge of the officials, who are responsible for clearing the long-distance, border crossing animal transports, and who re-certify the same unmodified trucks for animal transport after the permit expires.

However, these health hazards never appear in the statistics of the EU member states, because they are not identified. Since only actual suffering and hazards are recorded, the potential suffering of the animals and the hazards to them are not recorded, no matter how threatening they may be (RABITSCH, 2014).

B

“In 20 % (4 out of 20) of cases we observed that animals were stuck with their extremities and therefore unable to move and reach the water device and feed because the animals could not move or stand up in order to take their feeding position” (Wording by AWF)

Finding a young animal’s leg trapped between the lifting floor and the side wall of the truck is one of the worst experiences the undersigned has had in 14 years of working as an animal transport inspector (“Official Vet”) in Carinthia, Austria. It must be mentioned and highlighted that this situation is not a mere immobilisation of an extremity, but a very painful procedure, that destroys tissue with varying degrees of trauma: contusion, bruising, bleeding, scraping of the periosteum, fractures. Being trapped is not a short time incident, but very often it lasts for many hours until the next stop, that’s if the driver looks after the lambs at all (RABITSCH, 2014). For many hours the metal rubs and hits the bones. This is extremely painful indeed. The lamb, unable to think ahead, perceives this situation as hopeless and without prospect of release.

AWF found stuck animals in 20 % of the consignments, even though they could only inspect the ground loading level of the trucks. Finding at least 4 trapped animals in 20 inspected consignments is an extraordinarily high number.

Another negative aspect of being trapped is of course, that these lambs are immobile and therefore cannot reach the water devices. Over time and from stress combined with pain and possibly blood loss, they become increasingly thirsty to the point of suffering and lethargic.

In regard to the causes of these deficiencies, reference is made to the above. However, it must be mentioned that each deck should have a side protection in order to avoid the animals’ legs getting trapped between the deck and the side wall (RABITSCH, 2014, GAYER et al, 2016).

7. Partitions

Findings:

“Inadequate partitions were measured in 75% (12 out of 16) of the consignments
Number of consignments with inspected partitions” (Wording by AWF)

Assessment:

Inadequate partitions are a well-known threat in transports and pose a great danger to the welfare of the animals when parts of the body can be stretched sideways by or under these partitions. There are plenty of examples of misconstructions.

Particular care shall be taken to ensure that the construction of the vehicle does not have any sharp edges, gaps or openings which could cause cuts or crushing injuries or cause parts of the body to get caught or trapped.

It should be noted that all these vehicles with inadequate partitions hold a certificate of approval of means of transport by road for long journeys pursuant to Article 18 (2) of Reg(EC)No1/2005 issued by a Veterinary Office. It should also be noted that all these lorries with inadequate partitions are repeatedly loaded with, and transport, unweaned lambs after a clearance check performed by Veterinary Offices.

Again, it is stunning that inadequate partitions were found in the vast majority (75 %) of the inspected consignments. Here and according to the undersigned's own experience, lambs are trapped above all in the lateral gaps between the divider and the outer wall of the lorry. In addition to the symptoms described above, the lambs may also experience breathing difficulties when their whole small body is imprisoned, or edema of the head because of blood drainage disorders, when only the head is entrapped.

8. Head Height

Findings:

“Inadequate headspaces were observed in 90% (18 out of 20) of the consignments. In 94% (17 out of 18) of the consignments with inadequate headspace the body parts of transported animals were in contact with the deck above (head or back).”

(Wording by AWF)

Assessment:

Insufficient loading height with inadequate ventilation above the animals, when they are in a natural standing position, is a major concern in transports. This situation might lead to respiratory distress via reduced airflow, to unnatural positions in stance, to difficulties in moving around, in particular the inability to reach the drinking system, and bruising to their backs from scraping along the ceilings. This also happens in the two-storey loading of cattle, in 3-storey loading in whistanding.

The space above the top of the head should therefore be 15 cm for vehicles with good, forced ventilation systems and at least 30 cm for vehicles without forced ventilation (EFSA, 2002)

In UK slaughterhouses, bruising was found in a striking 71% of carcasses. The authors, however, assume that most bruising was probably caused by handling problems (wool-pulls) during loading on the farm, during transit and particularly at markets (COCKRAM and LEE, 1991).

Poor ventilation during transport and a change in feed seem to be the main reasons for deaths on transports for ruminants (ATKINSON, 2000).

Being impaired and not having the ability to move forward, especially the inability to reach the drinkers, may contribute to the dehydration, exhaustion and suffering of lambs.

Seeing that the Transport Regulation (EC)No1/2005 provides exact figures only for the loading height for the transport of Equidae, this topic is a matter of ongoing discussions amongst official veterinarians. A few veterinarians take the scientific recommendations of the European Food Safety Authority (EFSA, 2011) for granted, which are, for example, 15 cm above the top of the head for sheep and lambs in vehicles with good, forced ventilation. But, of course, these are just recommendations and do not provide any legal certainty for the veterinarians. Some veterinarians consider it sufficient if only a few animals touch the ceiling with their heads, as long as the general ventilation is not compromised too much, even if those animals are hindered from standing upright (HAFNER and RABITSCH, 2016).

The lack of precise legislation has important, practical consequences. If a veterinarian at an assembly centre does not approve a long-distance transport because of headspace being too low, the transporters sometimes simply change to another assembly centre in another district where the veterinarian is less strict.

Also, if a veterinary inspector at a road check or at a final destination interprets the head space directions in a stricter way and applies a fine on a transporter, this might lead to conflicts with the veterinary office at the place of departure, who considered the head space sufficient and approved the transport (HAFNER and RABITSCH, 2016).

This is one of many issues that inspection authorities are often unable to cope with due to the complexity of Regulation which remains vague in many items by frequently using indeterminate legal terms such as “appropriate “or “sufficient“.

Notwithstanding, it is the Commission itself that recommends that the EFSA proposals be considered binding (COM, 2011).

The findings of AWF indeed show horrible numbers. Inadequate headspace was observed in 90 % of the consignments (18 out of 20), and in 94 % of those consignments (17 out of 18) the body parts of the transported animals were in contact with the deck above (head or back). It would be beneficial to find out if and how many animals are constantly rubbing their backs against the roof of the storey.

Of course, lambs hampered by too low a head height, may also suffer from shortness of breath due to the obstructed airflow (cf. Ann. I, Ch. II, 1.2. and Ch. VI, 3.), and be prevented from moving and reaching the drinkers.

9. Space allowances

Findings:

A. *“Inadequate loading density was measured in 90% (18 out of 20) of the consignments.”*

B. *“At least in 44% (8 out of 18*) of the consignments measured space available for one animal was less than 0.18m².”*

** Number of consignments where space allowance calculations were possible to obtain.”*

Assessment:

A. *“Inadequate loading density was measured in 90% (18 out of 20) of the consignments.”*

Inadequate loading density implies that too many lambs were loaded onto the available loading areas of the trucks.

When journeys are rough, for example when roads include many bends and vehicles are driven at a speed which is normal for human passengers, sheep will stand but will avoid contact with other individuals, thus requiring more space. Therefore, sheep need additional space to keep their balance on rough journeys. (EFSA, 2002).

In this context it must be highlighted that the surface area indicated above may vary depending on the breed, the size, the physical condition and the length of fleece of the animals, as well as on the meteorological conditions and the journey time. Regarding the

two latter determinations it is important to know that – concerning the specifications of Ann. I, Ch. VII – *“Space allowances are minimum measurements”* [(Gavinelli in) COM, 2009a (concerning namely the transport of horses)]. The aforementioned deviations from the specified dimensions are to be interpreted in such a way that more space must be granted both for long-distance transports (i. e. transports of more than 8 hours) and, irrespective of the distances, in adverse meteorological conditions, i. e. particularly in hot and humid climates:

For long transports and hot weather conditions the loading density must be lower. More space must be offered for long transports and hot weather conditions.

For standard road transport vehicles used for long-haul transport of lambs, lowered loading density may be of considerable benefit in alleviating conditions that increase the risk of lamb deaths on hot days (FISHER et. al, 2002).

Very high stocking densities will prevent the animals from lying down and this may cause fatigue and muscle damage, particularly during long journeys (EFSA, 2002). If space allowances are too low animals may not get access to water, may get more easily injured, and may not be able to rest; if they do not rest enough, they will become exhausted, with detrimental effects for welfare and meat quality; etc. (ANIMALTRANSPORTGUIDES, 2017).

It is striking that 18 out of 20 transports of lambs did not fulfil the requirements of space allowances. The consequence is that the more densely the lambs are housed in the compartments, the less they can move. The less they can move, the less chance they have of reaching the drinking devices.

B. *“At least in 44% (8 out of 18*) of the consignments measured space available for one animal was less than 0.18m².”*

** Number of consignments where space allowance calculations were possible to obtain.”*

The Transport Regulation stipulates that the surface area indicated above may vary depending on the breed, the size, the physical condition, and the length of fleece of the animals. As an indication: for small lambs, an area of under 0.2 m² per animal may be provided.

Small lambs – here weighing less than 18 kg – were detected in 15 % (3 out of 20), whilst in 44 % of the consignments (8 out of 18) less than 0.18 m² of space per animal was granted. This clearly proves regular overloading when transporting lambs which is a major violation of the transport regulation and has the above-mentioned consequences with regard to animal welfare.

10. Bedding

Findings:

„Inadequate bedding was measured in 30% (6 out of 20) of the consignments” (Wording by AWF)

Assessment:

The Transport Regulation stipulates in Ann. I, Ch. II, 1,5. that *“... lambs of less than 20 kgs ... shall be provided with appropriate bedding material or equivalent material which*

guarantees their comfort appropriate to the species, the number of animals being transported, the journey time, and the weather. This material has to ensure adequate absorption of urine and faeces”.

A good bedding must be dry and dust-free. It should insulate against the cold of the floor, be tread-resistant and deformable. It should be gentle on the joints and protect against injuries and dirt. Straw fulfils these requirements very well. It is soft and elastic, but has a low absorbency. Therefore, sawdust is often used as an additional underlay (GAYER et al., 2016).

If too little or insufficient bedding material is used, the surface of the floor will become wet and slippery. The risk of slipping and getting injured increases. The young lambs prefer to stand rather than lie on the metal plates, which tires them very quickly.

11. Unfit

Findings:

„In 35% (7 out of 20) of consignments, animals unfit to continue the journey were detected” (Wording by AWF)

Assessment:

After consultation with representatives of AWF, the following was recorded in detail: The lambs were deemed unfit for various reasons, mainly lethargy, inability to walk, signs of illness (panting/high respiratory rate) and the consequences of being trapped with legs or head for a significant period of time.

Although the timing of the symptoms is difficult to gauge in most cases, the causes of lethargy and breathing problems do not lie, for example, in the acute exposure to a noxious agent, but in the past and symptoms may have been present before transport began. It is therefore presumably a question of how the fitness for transport was assessed before the start of the transport and how exactly the checks, according to Art. 14 leg. cit., were carried out.

If animals are deemed unfit for further transport, immediate action and remedial measures must be taken. If the continued transport of unfit animals would be an additional threat to their welfare, they should not continue the journey but be unloaded to be cared for outside the trucks.

The problems encountered here are that the distances between control posts are vast and that there are hardly any centres for emergency care along European highways. On the other hand, it is difficult for the drivers and attendees to spot these impaired individuals in several compartments on 3 or 4 storeys and within the rest break of one hour. In fact, it is highly questionable whether the persons in charge of the animals even carry out this thorough search for unfit animals, and it is questionable indeed, whether they are willing to remedy the needs of a few individuals in the face of several hundred others, who are not impaired.

After all, it is only with a lot of effort and attentiveness that the loading of lambs with reduced fitness can be avoided, especially when they are part of a large flock. The same applies when the lambs experience a deterioration of their fitness during haulage. If the

effect only lasts a short time, reduced fitness can be overcome, but the longer the journeys last, the longer the negative impact is present and distresses the animals.

Animal-based indicators

Animal-related stress factors (GAYER et al., 2016) are the lack of transport routine, illness, insufficient food or water intake, genetic predisposition, loss of familiar surroundings, getting along in an unfamiliar place, hierarchy struggles, direct contact with unfamiliar animals and people, lack of escape routes, limited mobility, etc.

Together with environmental stress factors, e. g. the above (s. “Infringements”) described ambient temperatures outside the convenient zone and logistic thresholds, inadequate drinkers, the withholding of water and food supply, hazardous partitions, insufficient internal compartment heights, overloading and unequal space allocation, insufficient bedding material and extraordinary long travelling times will lead to bodily and behavioural reactions in the animals concerned.

The physical and behavioural reactions of lambs to real or perceived threats can be monitored, numbered and assessed. Each animal will respond differently to these factors according to its own characteristics (age, sex, breed, character); these responses are assessed using animal-based measures (EFSA, X; EFSA, 2012). Thus, using animal-based indicators means implementing standardised ways of assessing animal welfare based on animal responses.

Animal-based measures can be identified either by observation or inspection of the animal but can also include records obtained using automated methods.

Potential welfare indicators are coughing, faecal soiling, head shaking, head tilting, injuries, lying, nasal discharge, ocular discharge, oral behaviours, play behaviours, shivering or vocalisation, especially in underdeveloped lambs. Also, treatment incidences, complications after routine surgery (castration, tail docking) and animal losses.

According to ANIMALTRANSPORTGUIDES (2017) the following are Animal Based Measures which can be used to monitor sheep welfare during transport:

Animal Based Measures	Description
Death on arrival	Animal that has stopped breathing and has no pulse (cardiac arrest) on arrival.
Severe lameness or non-ambulatory	An animal is considered severely lame when it shows inability to bear weight on one or more limbs while standing. An animal is considered non-ambulatory when it cannot rise or is unable to stand un-aided.
Slipping	Animal showing a loss of balance with a leg sliding unintentionally over a small distance
Falling	Animal showing a loss of balance during loading/unloading causing other part(s) of the body (beside legs) to touch the floor.
Shivering, panting or sweating	Shivering is defined as the slow and irregular vibration of any body part, or the body as a whole

	(skin movements due to flies are not assessed as shivering!). Panting is defined as breathing in short gasps carried out through the mouth. Animals with visible signs of sweating on their skin (wet animals, dried sweat spots, salt deposits) during transport are counted as sweating animals.
Cleanliness	Sheep are considered dirty if $\geq 25\%$ of the body surface is covered with dirt.
Exhausted	Signs of severe fatigue or exhaustion are e.g. chin or limbs resting at partitions or troughs, closed eyes, high drive to rest in recumbent position.
Other severe health problems	Any severe clinical health problem that is easy visible and may have been initiated or worsened by transport (management) and is not already covered by the parameters above.

An example of a predominantly animal-related indicator and assessment system are the WelfareQuality® protocols (WELFARE QUALITY, 2009).

PHYTIAN et al. (2013) assessed ten animal-based indicators by observation – demeanour, response to stimulation, shivering, standing ability, posture, abdominal fill, body condition, lameness, eye condition and salivation.

LLONCH et al. (2015) considered nine indicators theoretically feasible for assessing sheep welfare at abattoirs; these were body cleanliness, carcass bruising, diarrhoea, skin lesions, skin irritation, castration, ear notching, tail docking and animals recorded as ‘obviously sick’.

MESSORI et al. (2015) developed an assessment tool for sheep welfare after long transport journeys with resource-based, management-based and the following animal-based measures - dead on arrival, dead in pen, non-ambulatory, exhaustion, slipping, falling, reluctance to move, lameness, injury, coughing, hampered respiration and high respiratory rate.

WILLIS et al. (2021) cite and investigate a large variety of animal-based (behaviour and health), resource- and environment-based measures of animal welfare in sea transports.

In the following, five special features are described, which were found and measured by AWF in transports of lambs: Vocalisation, licking or biting metal bars or walls in the vehicle, lethargy, and increased morbidity and mortality.

1. **Vocalisation**

Findings:

“Vocalizing (bleating) lambs were measured in 85% (17 out of 20) of the consignments (most of the animals from the vehicles concerned” (Wording by AWF)

Assessment:

Vocalising occurs, when animals (here; lambs and sheep) elicit a sound such as a bleat or baa.

Apart from affiliating social interactions, e.g., between mother and her offspring, farm animals often indicate when they are distressed by vocalising (WATTS, 2001).

Vocalisation in sheep was measured when they are visually isolated, on the moving trailer and during introduction to a new flock (ATKINSON, 2000).

Vocalisation and teeth grinding can be observed in sheep that suffer isolation distress (ANIMALTRANSPORTGUIDES, 2017).

When the ewe-lamb bond is broken, frustration arising from maternal feeding deprivation and the absence of maternal care alter endocrine and behavioural responses and reduce growth, suggesting emotional disturbances in the lambs. Disruption of the maternal relationship is therefore at least a transient source of poor welfare for lambs, and may disturb the acquisition of social and survival-related behaviours. The lambs manifested strong vocal responses when these periods of temporary separation were first imposed. Even brief separations from the mother or siblings result in an increase in the number of vocalisations and in behavioural arousal; findings that suggest psychological stress. (DALMAU et al., 2014).

Hunger leads to behavioural expressions like bleating, licking the surroundings or comrades. The longer the withdrawal of food lasts the more the animals will bring this to the attention of their environment. The more lambs vocalise, the more stressed they are.

If vocalising lambs have been measured in 85 % (17 out of 20) of consignments and most of the animals from the vehicles were found vocalising, it can be assumed with a probability bordering on certainty that the animals are starving, thirsty or at a minimum hungry, as described above (s. "Infringements": 2. Drinkers; 5. Travelling time): From the repeated, loud, intense and ongoing bleating of the vast majority of lambs on board a vehicle it can be concluded that the animals experience thirst and/or hunger, because of not being watered or fed (with liquid feed) at least not sufficiently, not in necessary quantities or not at required intervals.

2. Licking or biting metal bars or walls or nipples of the vehicle

Findings:

"Lambs biting the metal bars or licking the walls/nipples of vehicle were measured in 85% (17 out of 20) of the consignments (most of the animals from the vehicles)"

(Wording by AWF)

Assessment:

Oral behaviours, such as sucking or licking pen-mates or objects, are considered abnormal and a sign of reduced welfare due to inappropriate or inadequate environmental stimulation or feeding. These suckling behaviours could indicate hunger, boredom, or frustration, all of which are negative experiences that can have a detrimental impact on welfare if intense.

In view of the above mentioned impossibility to provide liquid food (milk or substitutes) to unweaned lambs and the difficulties in watering lambs on board the trucks (s. "Infringements": 2. Drinkers; 5. Travelling time), and in the given situations when most of the animals show this abnormal behaviour, it is highly likely that the **licking or biting metal bars or walls of the vehicle or nipples** are in fact caused by considerable hunger in

combination with the impossibility to satisfy the behavioural need to suckle for nourishment.

3. **Lethargy**

Findings:

“Lethargic animals were measured in 30% (6 out of 20) of consignments.” (Wording by AWF)

Assessment:

In medical terminology, lethargy is a form of disorder of consciousness associated with increased drowsiness and an increase in the stimulus threshold. Lethargy can be the endpoint or an accompanying symptom of an illness or physical or mental exhaustion.

Lethargic lambs show a lack of interest in their surroundings, are dispirited, apathetic, move slowly if at all or are even non-ambulatory, listless or dull. In severely fatigued lambs, the chin or limbs may rest against partitions or troughs, the eyes are closed and they have a high drive to rest in a recumbent position. In severe forms of lethargy, it is difficult to identify other symptoms and the underlying cause. Sometimes lambs are found on board vehicles showing only lethargy and no other visible signs of injury or infection.

Lethargy must be distinguished from a reluctance to move, which is a mere unwillingness.

In case of welfare controls, ideally alert, active, and attentive animals are expected.

Finding lethargic animals in an appalling 30 % of the consignments should be above all an alarming signal: Something has gone wrong, either in the assessment of the fitness to transport before loading or, the conditions on board need to be scrutinised.

4. **Morbidity**

Findings:

“Morbidity symptoms were measured in 30% (6 out of 20) of consignments.” (Wording by AWF)

Assessment:

Per definition morbidity (s. e.g.) in animals is

1. the incidence of disease: the rate of illness (as in a specified population or group) or
2. a diseased state or symptom.

AWF defines morbidity as any significant sign of a disease. After consultation with representatives of AWF I was informed that nasal and ocular discharge, as well as dehydrated lethargic and injured (trapped) animals were found on board the vehicles with lambs.

Weaning, particularly at a young age, is associated with perturbed growth rates and an increased susceptibility to disease. Disruption of the maternal relationship, therefore, is at least a transient source of poor welfare for lambs (DALMAU et al., 2014).

Young animals are most susceptible to diseases. In diseased lambs, one has to consider the hypoglycaemia-hypothermia complex, milk deficiency, deficiency diseases (selenium, copper, iodine, ...), clostridiosis of various types, infections with E.coli, salmonellosis, rota-, corona-, reo- or adenovirus, or cryptosporidia, listeria, various intestinal parasites (e.g. Coccidia, Haemonchus, etc.), and pasteurilla as a harmful pathogen of the respiratory tract, as well as intoxications e.g. with copper, and much more (s. e. g. DEINHOFER and STÖGER, 2019).

When lambs are weaned just before transport, the absence of maternal care and absence of milk is added to the various stressors associated with transport. Therefore diseases are more likely in such animals (EFSA, 2002).

The fact that symptoms of illness are found in about one third of the consignments inspected is as alarming as the finding of lethargic animals on board: Something must have gone wrong, either in the assessment of fitness for transport before loading or, in the conditions on board the vehicles, which must be subjected to close scrutiny.

5. Mortality

Findings:

“Dead animals were measured in 10% (2 out of 20) of the consignments” (Wording by AWF)

Assessment:

Mortality during transport is an indisputable indicator of poor welfare as any animal that dies in transit can be expected to have experienced some degree of suffering before death. „Any journey above 4 hours increases the welfare risk as it increases the likelihood of increased mortality“ (FAWC, 2019).

The insight view in the basic data of AWF’s observations shows that there were at least 2 fatalities in the 20 consignments observed by AWF. Padalino (PADALINO et al., 2018) e.g., states that *„cases of mortality and/or morbidity were reported for only 11 out of the 1391 trucks (0.8 %)“*.

At least in calves, long periods of food and liquid deprivation, in combination with mixing of the animals, unloading and reloading procedures and other stressful impacts might lead to sudden deaths on board. The main causes are dehydration and exhaustion which might also lead to a vast variety of infections and consecutive diseases which might occur as late as 3 to 4 weeks after transportation (FIORE et al., 2010; MAY et al., 2021). These findings are similar in the transport of lambs.

Over 20 years ago HALL and BRADSHAW (1998) spoke of the cumulative stress factors in transport, esp. of sheep where the transport may follow soon after stressful experiences such as weaning, shearing, handling, or marketing.

Transport in general has been shown to increase: pneumonia caused by pasteurellosis (“shipping fever and subsequent mortality and salmonellosis in sheep (EFSA, 2002).

In the present report of AWF dead bodies were found in 2 consignments, there was also vocalisation from the animals in those lorries as well as animals that were licking and biting metal bars. The co-occurrence of two or more animal-based indicators gives strong

evidence of impeded welfare on board the vehicles. These cases caused most likely caused by the lack of a supply of liquid and inadequate drinkers.

Summary

Vocalisation, licking or biting metal bars or drinking nipples or the wall of the vehicle, lethargy, morbidity, and mortality are valid animal-based indicators to assess welfare on board livestock vehicles.

The report of Animal Welfare Foundation (AWF) shows how the inappropriate or wrong furnishing of the trucks with drinkers, dividers and bedding, wrong calculations of loading heights and space allowances, wrong assessments of the weaning status of lambs and the mixing of individuals with strongly differing sizes all have a negative impact on the health of the animals. Added to these factors are bad transport practices (too long duration of the journey, too short rest breaks, transport in too hot or too low temperatures). These are circumstances that are all directly linked to impeded animal welfare.

Legal Basis

COUNCIL REGULATION (EC) No 1/2005 of 22 December 2004 on the protection of animals during transport and related operations and amending Directives 64/432/EEC and 93/119/EC and Regulation (EC) No 1255/97.

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