



**Analysis of control
data of transports
of calves 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 conspicuous features in the long-distance transport of non-weaned calves.

According to AWF's representative the material was evaluated after trailing and inspecting 15 long-distance transports of non-weaned calves. These examples have been taken from a pool of several dozen transports that were trailed and inspected between 2015 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 based 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. Where there was insufficient time for our teams to complete truck inspections, the results of such inspections were not included in the data analyses. For this reason, each specific problem observed has a different number of total vehicles that were inspected. 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.”*

The findings infringements of the relevant law [Reg. (EC) No 1/2005] as well as peculiarities directly linked to the compromised wellbeing of the animals (animal-based indicators for impeded welfare = animal-based material = ABM).

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

CALVES			
Animal-based indicators			
		Observed in ... consignments [percentage, number]	Estimation of animals concerned
1	Vocalization	100% (15 out of 15)	Most of the animals
2	Cross-suckling	≥ 40% (6 out of 15)	Some of the animals
3	Licking or biting metal bars or wall of the vehicle	≥ 73% (11 out of 15)	Most of the animals
4	Restlessness	≥ 67% (10 out of 15)	Most of the animals
5	Mortality	≥ 20% (3 out of 15)	Some of the animals
Infringements			
		Observed in ... consignments [percentage, number]	Commentary of AWF
1	Temperature exceeding the thresholds	20% (3 out of 15)	High probability; below 0°C (-1 to -10°C)
		7% (1 out of 15)	High probability; above 30°C (real feel).

2	Drinkers inadequate	100% (15 out of 15)	No consignment has adequate drinkers
	feeding requirements (intervals) not granted	≥ 73% (11 out of 15)	Not fed after 9hrs of journey
3	Partitions inadequate	≥ 13% (2 out of 15)	Missing adequacy
4	Head Height inadequate	≥ 33% (5 out of 15)	Space above the animals
5	Bedding insufficient	0% (11 out of 11)	All consignments have adequate bedding
6	Travelling time exceeded the maximum allowed	≥ 47% (7 out of 15)	Exceeded the legislative limits
	too short rests	≥ 58% (7 out of 12)	Rest at CP less than required 24h

The Analysis

The following assessment starts with the infringements and postpones ABM's. The reason is the assumption of a better method of describing in which way rules are broken and how these infringements impact on the animals' condition and also on their 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% (3 out of 15) of the consignments there was a high probability legislative limits were exceeded [Reg(EC)No1/2005]- carrying calves when the outside temperature was below 0 °C (in range -1 to -10°C)." (Wording by AWF)

In "7% (1 out of 15) of the consignments there was a high probability legislative limits were exceeded [Reg(EC)No1/2005]- carrying calves when the outside temperature was above 30 °C (real feel)." (Wording by AWF)

Assessment:

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

Unweaned calves are very susceptible to extreme temperatures that can manifest as 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). The thermoneutral zone of the young calves ranges from 10 °C to 25 °C dependent on age, weight, environmental conditions, and other stress factors (DAVIS and DRACKLEY, 1998). According to the Commission (COM, 2009) 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 temperature range should be maintained between 5 °C and 25 °C (VELARDE et. al., 2021). The Commission (ANIMALTRANSPORTGUIDES, 2018) also recommends the optimum temperature for transporting non-weaned calves is between 5 °C and 25 °C. This is not statutory law, but the best guide according to scientific knowledge and should be common sense between the stakeholders involved.

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 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 non-weaned 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 in the scale these animals are transported within the union. Additionally, it will be shown below that there is no adequate drinking equipment available at all that is able to fulfil the behavioural and physiological needs of non-weaned calves, 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 non-weaned calves increases significantly. The correct supply with liquids is extremely questionable, and not at all possible with liquid feed.

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

2. Drinkers

Findings:

A: “100% of consignments had inadequate drinking devices.” (Wording by AWF)

B: “In at least in 73% (11 out of 15) of the consignments animals were not fed after 9 hours of the journey (Note: it is likely that more than 73% of the consignments did not feed calves on board, but it was confirmed beyond doubt in 11 cases).” (Wording by AWF)

Assessment:

A: “100% of consignments had inadequate drinking devices.”

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.

Animals must be in a position to be able to become accustomed to the mode of transport (Ann I, Chap III, 1.1.), as well as the mode of feeding and watering (Ann I, Chap III, 2.7.).

Calves are generally only accustomed to teats, artificial rubber teats, or teats made of another malleable material which allow the calf 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 (RABITSCH, 2020; RABITSCH and MARAHRENS 2020, 2021). These calves need to be provided with drinking devices they are already used to, i.e., a malleable rubber teat which is suited to a sucking action. (HERZOG et al., 2019; MARAHRENS and SCHRADER, 2020). Therefore, buckets with malleable teats must be provided (COM, 2009). When using buckets, it is important that unweaned calves can easily recognise the buckets as a source of feed, and also that the amount of feed they consume can be controlled.

The standard method of caring for unweaned calves is still the provision of drinking water through a metal nipple device. Here, changing the position of the mandrel/seal of the nipple will affect the flow of liquid. Although some calves, when hungry and searching for feed, are able to get the mechanism of such drinking devices working by licking and sucking their surroundings, it is fact that these nipples are in no way suited to safely providing unweaned calves with sufficient drinking water (RABITSCH, 2014; MARAHRENS and SCHRADER, 2020).

Simply putting a malleable plastic case over a metal nipple – as it happens in new-styled drinking devices for non-weaned animals – does not enable a calf to suck on it properly in any sense. Here, as with (the underlying) metal nipple device, a valve is opened so that the liquid fills the “teat” and runs out or - depending on the pressure in the drinking system - squirts out and fills the calves’ mouths without any further action needed. In this respect, the calves are not able to suck alternating between a sucking phase, which takes up most of the time, and a subsequent swallowing phase (MARAHRENS and SCHRADER, 2020).

If calves do succeed getting liquids from these devices, they do so to a limited extent, often in uncontrollable amounts, and not all calves are able to.

Usually, only water or electrolyte drinks are provided. Currently it is not possible to provide unweaned calves with a milk substitute on board which is suitable and adequate for their demands (cf. EFSA, 2008; COM, 2009).

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 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 calves and always with clearance from the veterinary offices.

These shortcomings were repeatedly found by the Food and Veterinary Office (FVO), e.g. in DG(SANTE) 2017-6107 (COM, 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. 1/2005... 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“.*

B: "In at least 73% (11 out of 15) of consignments animals were not fed after 9 hours of the journey (Note: it is likely than more than 73% consignments did not feed calves on board, but it was confirmed beyond doubt in 11 cases)." (Wording by AWF)

AWF observed that in the vast majority of cases (11 out of 15 consignments, 73%) the non-weaned calves were not fed during the one-hour pause despite the stipulation of Ann. I, Ch. V, 1.4. (a) of Reg(EC)No1/2005 that the truck must stop after nine hours of travel and the animals must be given a rest period of at least one hour or sufficient time for them to be given liquids and fed if necessary. The need to feed animals after nine hours is due to the otherwise excessively long intervals between the previous feed and the next feed (see below).

Out of multiple findings it is evident that non-weaned calves cannot be fed on board the trucks at all, meaning that they cannot get liquid food (milk, milk substitute) (ANIMALTRANSPORTGUIDES, 2018; MARAHRENS and SCHRADER, 2020; RABITSCH 2020); RABITSCH and MARAHRENS, 2020, 2021).

It is evident that it is impossible to feed non-weaned 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 the possible intake of liquids.

The reason that it is impossible to grant 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 a dry powder-substrate. Even if it were possible to create a suitable liquid feed, that feed would have to be administered individually according to the needs of the respective calves, which are transported in several compartments on (2 or) 3 layers of a semi-trailer.

It can hardly ever be proven that individual calves have received sufficient liquids (water, electrolyte solutions) according to their needs, if liquids are offered to the animals at all.

Sometimes non-weaned calves are unloaded at control posts for a mid-trip feed immediately after the first 9 hours of travel. They are reloaded again shortly after the 1 hour break and it is highly questionable if all the animals get liquids within this short period and it is even more doubtful that they are given liquid feed.

Furthermore, feeding milk substitutes to non-weaned calves without any subsequent resting period after the meal, but instead reloading the animals immediately, causes more stress, is contrary to Art. 3 of Reg(EC)1/2005 and contrary to all welfare considerations.

It must also be noted that control posts are foreseen and approved for 24 hours rest periods only, and only when the journey is close the maximum allowed journey time of the transported animals and are not for short-term stops. Apart from the stressors imposed on the young live beings this course of action (one hour stops) would cause problems with biosecurity and disinfection.

When non-weaned calves are not given liquid feeds during transport, they will not get their next meal for up to one hour after arriving at the place of destination, at the earliest. This means that the withdrawal time of nourishment is approximately 20 hours and that's if (if!) they received feed at all, and not only electrolyte fluids, at the place of despatch. [Electrolytes as pre-transport diet do not fulfil the calves' nutritional requirement (VELARDE et al., 2021)]

There is not an obligation to feed animals at assembly centres at all, only the supply of water is mandatory. Therefore, the last feeding might have been back at the farm where the animal originated from and that may be as far as 8 hours ago according to Art. 2 (r) (ii). In reality, calves are very often only watered with electrolyte solutions (ZAR, 2019) at the alleged place of destination, before they are- contra legem - reloaded within a few hours and transported to contracting partners in neighbouring villages. Altogether, very often calves will not get nutrition for up to 33 hours.

Whereas calves in a free range environment demand milk from the mother's udder up to 12 times a day, in farming they will get milk or a milk substitute traditionally only twice a day. On the basis of farm practices, 12 hours may be recommended as maximum interval between milk meals (VELARDE et al., 2021). Given these intervals, their hunger intensifies a lot in the hour(s) preceding the next feeding time.

Hunger leads to behavioural expressions like bleating, mooing and roaring, licking comrades or the surroundings. The longer the withdrawal of food lasts the more the animals will exhibit these behaviours.

Amongst other things, the key risk factors identified for poor calf welfare associated with transport include - long transport and fasting durations, young age at the time of transport and poor colostral immunity (ROADKNIGHT et al., 2021).

The longer the withdrawal of food lasts the more the animals suffer. Modest bodily discomfort 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 withdrawal of feed, which goes against their natural self-preservation instinct, and also from the unfamiliar surroundings which they perceive to be life-threatening (BERNATZKY, 1997).

This suffering can only be stopped by satisfying the needs of the animals which includes satisfying their hunger by feeding them.

Long transports where calves are not properly fed before departure or during the resting period, challenge the welfare and health of the calves, especially the unweaned calves that have low body reserves and immunological weakness (VELARDE et al, 2021).

Calves have a behavioural and physiological need to ingest milk by sucking. The position of the head during milk drinking is essential to prevent liquid from flowing into the developing rumen. For the best welfare of the calves, liquid feed should be provided with rubber teats placed at 50-75 cm high. After milk feeding the calves need at least 3 h of rest for proper digestion. Improper digestion increases the risk of diarrhoea.

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)No1/2005 in conjunction with Ann. I, Chap. V, 1.4. a) (cit: "fed, if necessary"); there is a need to feed non-weaned calves after 9 hours of travelling. Otherwise the feeding intervals would be far beyond the physiologically maximum acceptable 12 hours. Just providing drink and not feed will lead to unjustifiable and avoidable suffering (RABITSCH, 2020; RABITSCH and MARAHRENS, 2020, 2021), which is clearly an offence against Art. 3 of Reg(EC)No1/2005 stipulating "*No person shall transport animals or cause animals to be transported in a way likely to cause injury or undue suffering to them*".

Talking about undue suffering, it is important to highlight at this point the status of the unweaned animals: Non-weaned calves are allowed to be transported for more than 8 hours when they are older than 14 days. Thus, these animals are transported across Europe in repeated rotations of 19 hours periods during which time they are exposed to many unfamiliar experiences and many different microbiological and environmental stressors. When calves are between 2 and 4 weeks old, they experience an immunological gap due to the shift between passive and active immunity that compromise animal health and welfare during and after transport (RABITSCH and MARAHRENS, 2020, 2021; VELARDE et al., 2021) and make them particularly susceptible to infectious noxae. This naturally and regularly occurring immunological gap must be considered to be a physiological weakness, which renders the animals unfit for transport according to Ann. I, Ch. I., 2 of Reg(EC)No1/2005.

3. Partitions

Findings:

“In 13% (2 out of 15) of consignments the partitions were inadequate (Note: most likely that more than 13% had inadequate partitions but in 11 cases data were not obtained).”
(Wording by AWF)

Assessment:

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

Particular care should 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.

The 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).

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

It should be noted that all these lorries with inadequate partitions hold a certificate of approval of means of transport by road for long journeys pursuant to Article 18(2) issued by a veterinary office. It should also be noted that all these lorries with inadequate partitions on board are repeatedly loaded with, and transport, non-weaned calves after obtaining clearance by veterinary offices.

4. Head Height

Findings:

“In at least in 33% (5 out of 15) of the consignments the space above the animals was inadequate.” (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, unnatural standing positions, difficulty in moving around, in particular the inability to reach the drinking system, as well as severe back bruising when their backs scrape along the ceilings. This happens in two-storey loading of cattle as well as in 3 storey loading of calves, sheep and goats.

Being unable to move and reach the drinkers might contribute to dehydration, exhaustion and suffering of non-weaned calves.

Whereas the Transport Regulation (EC)No1/2005 provides exact figures only for the loading height in transports 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.

The lack of precise legislation has important practical consequences. If a veterinarian at an assembly centre does not approve long-distance transports because of inadequate headspace, 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 final destination interprets the head space instruction 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, which considered the head space sufficient and approved the transport (HAFNER and RABITSCH, 2016).

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

5. **Bedding**

Findings:

“In 100% (11 out of 11) of the consignments the bedding was adequate (The bedding was adequate in all consignments).” (Wording by AWF)

Assessment:

The assessor considers this to be an extremely positive result.

Adequate bedding material should be dry with a high ability to soak up fluids. Sufficient amounts of bedding allow for more comfort and facilitate the resting of animals (ANIMALTRANSPORTGUIDES, 2017). When the bedding is dirty and wet with faeces, urine or intruding liquids (rain, moisture), or when the majority of the animals are dirty, for example with fresh faeces, it is also considered inadequate.

It is evident that providing sufficient litter for the transport of non-weaned calves has significantly improved in recent years.

6. Travelling time

Findings:

A: “At least 47% (7 out of 15) of the consignments exceeded the legislative limits of maximum journey times (Note: it is likely than more 47% of consignments exceeded the limits since not all the data of the complete travelling times were obtained).” (Wording by AWF)

B: “At least 58% (7 out of 12) of consignment that should provide 24 hours’ rest for calves spent less than required 24 hours at CP (Note: for these 12 consignments 24 hours’ rest was mandatory after 19 hours of travel).” (Wording by AWF)

Assessment:

A: “At least 47% (7 out of 15) of the consignments exceeded the legislative limits of maximum journey times (Note: it is likely than more 47% of consignments exceeded the limits since not all the data of the complete travelling times were obtained).” (Wording by AWF)

Very often the transport times of animals in general, and especially transport times of non-weaned calves is calculated with unrealistic maximum and average velocities for the heavy trucks which move animals (RABITSCH and WESSELY, 2012a, b; RABITSCH et al., 2020). Sometimes it is nearly impossible to transport calves 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 forces that challenge a bending of the law. Thus, calves are sent via multiple assembly centres in order to cross the whole Union (MAISACK and RABITSCH, 2018, 2020), or 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 feel they are authorised to include an extra of 2 hours in planning of routes, which in fact is already allowed – according to Ann. I, Ch. V, 1.8. – only in the case of materialising of unforeseen and unforeseeable contingencies.

Transporting non-weaned calves for longer than the legislative limits of maximum journey times permits, means that the animals have to face an even longer period where they cannot be supplied with feed. Explicitly it is stated here that this happens at the age of special receptivity of the non-weaned calves (s. above: “immunological gap” – “physiological weakness”).

B: “At least 58% (7 out of 12) of consignments that should provide 24 hours’ rest for calves spent less than required 24 hours at control posts (Note: for these 12 consignments 24 hours’ rest was mandatory after 19 hours of travel).” (Wording by AWF)

According to Ann. I, Ch. V, 1.5. of Reg(EC)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, calves 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

hours' rest is a scientifically based and politically ruled time for rest and recreation for animals, which 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.

Shortening the time at control posts means not-granting animals the necessary time for recreation. Here, particular emphasis must be placed on the fact that non-weaned calves between 2 and 4 weeks old are most vulnerable because of the immunological gap they experience at this age (s. above: immunological gap" – "physiological weakness").

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 (under "Infringements") described deviations from thermoneutral temperature zone, inadequate drinkers, the withholding of water and food supply, hazardous dividers, insufficient internal compartment heights, space allocation, bedding material, extraordinarily long travelling times and a shortage of rest times will lead to bodily and behavioural reactions of the animals concerned.

The physical and behavioural reactions of calves 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 using 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.

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

Potential welfare indicators are coughing, faecal soiling, head shaking, head tilting, huddling, injuries, lying down, nasal discharge, ocular discharge, oral behaviours, play behaviours, shivering or vocalisation (PALMER et al., 2021), and furthermore, in underdeveloped calves, treatment incidences, complications after routine surgery (dehorning, castration), animal losses (AGRARHEUTE, 2020; KTBL, 2020).

In the following, five special features are described which were found and measured by AWF in transports of non-weaned calves: Vocalisation, cross-suckling, licking, or biting metal bars or walls in the vehicle, restlessness and increased mortality.

1. Vocalisation

Findings:

"In 100% (15 out of 15) of consignments: vocalizing calves have been measured (most of the animals from the vehicles)." (Wording by AWF)

Assessment:

Apart from affiliating social interactions, e.g. between mother and her offspring, farm animals often indicate when they are distressed by vocalising (WATTS, 2001). This is a good indicator of the intensity of the emotional response: the more calves vocalise, the more stressed they are. Calves isolated from their mothers show both the number of vocalisations and their volume to be above the level of united mother-child pairs and (EHRlich, 2003). BOLT et al. (2017) describe how during weaning, the number of vocalisations increased sharply, indicating that the weaning process was stressful for the calves. However, most vocalisations were not recorded during weaning but only in the post-weaning period at the time of total milk withdrawal.

The scarcely watered calves are always more or less hungry, bleat more frequently, play less often. It seems to be evident that calves which are intended for breeding are fed considerably better than those who are sold at the earliest possible moment (KASKE, 2018).

If vocalising calves have been measured in 100% (15 out of 15) 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 very thirsty or hungry, as described above (under: Infringements / 2. drinkers): From the repeated, loud, intense, and ongoing bleating of the vast majority of non-weaned calves 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, in the necessary quantities and not at the required intervals.

2. Cross-suckling

Findings:

“At least in 40% (6 out of 15) of consignments cross suckling among the calves has been measured (some of the animals from the vehicles).” (Wording by AWF)

and

3. Licking or biting metal bars or wall of the vehicle

Findings:

“In at least 73% (11 out of 15) of the consignments biting/licking metal bars/walls of the vehicles has been measured (most of the animals from the vehicles).” (Wording by AWF)

Assessment of both: 2. Cross suckling and 3. Licking or biting metal bars or wall of the vehicle:

Aside from the fact that scarcely watered calves, compared to intensively watered calves, are always more or less hungry, bleat more often and play less often, they show ethopathies, such as mutual sucking more often. (KASKE, 2018). Cross suckling is likely to reflect compromised welfare associated with inadequate feed intake (PALMER et al., 2021).

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. [In addition, the most important risk factors in the stable include too little watering both in frequency and duration (twice daily bucket watering), low

sucking resistance (large opening of the sucker), lack of space for movement and lack of environmental stimuli as well as insufficient supply of roughage (KTBL, 2020).]

These suckling behaviours could indicate hunger, boredom, or frustration, all of which are negative experiences that impact welfare detrimentally if intense.

In view of the above mentioned impossibility (s. “Infringements” / drinkers) to provide liquid food (milk or substitutes) to the calves on board a truck and considering the big intervals between watering and also that non-weaned calves will get electrolyte solutions at best, **cross-suckling** [40% (6 out of 15) of consignments] in the given situations as well as **licking or biting metal bars or wall of the vehicle** [73% (11 out of 15) of consignments] are behaviours that are, in fact, initiated by considerable hunger in combination with the impossibility to satisfy the behavioural need to suckle for nourishment.

But oral behaviours reflect not only experience of recent food deprivation, but likely indicate longer-term welfare problems in young calves, relating to inappropriate feeding or environmental conditions (PALMER et al, 2021).

4. Restlessness

Findings:

“In at least 67% (10 out of 15) of consignments: restless calves have been measured (most of the animals from the vehicles).” (Wording by AWF)

Assessment:

Immediately after a satisfying meal of liquid feed of milk or milk substitute, and within the following 3 hours, non-weaned calves will dedicate their time to digestion and lie down, mostly in a sternal recumbency. Non-weaned calves spend most of their non-feeding time in this position. Thus, lying down is unlikely to be a helpful indicator of welfare status in bobby calves in lairage, except to note that many calves were willing and able to rise from lying down when the researcher was inside the pen (PALMER et al., 2021).

This shows that it is alarming when small calves become alert and stand up when somebody is approaching.

This is very similar to the restlessness which is described by AWF.

The difference can be found in the fact that restless calves cannot be found isolated in 67% of the consignments – which might be an activation of the alert system only –, but this sample is overlapping with the cross suckling calves [40 % (6 out of 15) of consignments] with the calves licking or biting metal bars or wall of the vehicle [73 % (11 out of 15) of consignments].

Restlessness is not a standalone criterion. It must be assessed together with the parallel oral stress behaviours of cross and environmental sucking. In this sense, restlessness becomes an indicator for poor wellbeing.

5. Mortality

Findings:

“In at least 20% (3 out of 15) consignment dead animals have been measured (1 to 4 fatalities in the respective 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 longer 4 hours increases the welfare risk as it increases the likelihood of increased mortality” (FAWC, 2019).

The insight view into the basic data of AWF’s observations shows that there were at least 7 fatalities in the 15 consignments observed by AWF; there was 1 consignment with 1 dead body, 1 with 2 and 1 with 4. Finding 7 dead calves in only 15 consignments is an extraordinarily high outcome, compared to available statistics, especially as only the lower loading level could be assessed in each case. 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 %)”*. SIMOVA et al. (2016) found *“the highest mortality rate [...] in calves (0.296 %)”*, whereas VECEREK et al. (2006) reported a similar overall calf mortality rate, in connection with transport, of 0.026 %

A long exposure to 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 and above all deaths due to dehydration and exhaustion. These stress factors 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).

In the present report of AWF, dead bodies were found in 3 consignments, vocalisation was observed in all 3 lorries and (a) cross suckling (b) licking and biting metal bars and (c) restlessness were observed in 2 of the 3 lorries. The co-occurrence of two or several animal-based indicators gives strong evidence of impeded welfare on board the vehicles, in these 3 cases caused by a lack of liquid supply and inadequate drinkers.

Summary

Vocalisation, cross-suckling, licking, or biting metal bars or the wall of the vehicle, restlessness and mortality are valid animal-based indicators to assess welfare on board of livestock vehicles. The report of Animal Welfare Foundation shows that inappropriate or wrong furnishing of the trucks with regard to drinkers, dividers and loading height and bad transport practices (journeys that are too long, rest breaks that are too short, transport in temperatures that are too hot or too low) are linked to these stress indicators and impeded welfare. The latter shortcomings are described as infringements of the relevant law Reg(EC)1/2005.

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.

Literature

AGGARWAL and UPADHYAY (2013): Aggarwal, A., Upadhyay, R., 2013. Heat Stress and Animal Productivity; Springer India, ISBN: 978-81-322-0879-2.

AGRARHEUTE (2020): 2020 | KTBL und Thünen-Institut, Tierschutzindikatoren: Ziel- und Alarmwerte für Aufzuchtälber, <https://www.agrarheute.com/media/2020-07/KTBL-TI-Tierschutzindikatoren-Ziel-und-Alarmwerte-fuer-Aufzuchtkaelber.pdf>, (last accessed 29. 9. 2021).

ANIMALTRANSPORTGUIDES (2018): Europäische Kommission
- Leitfaden für bewährte Verfahren beim Transport von Rindern, ISBN:978-92-79-87126-9, <http://animaltransportguides.eu/wp-content/uploads/2017/03/DE-Guides-to-Good-practices-for-the-Transport-of-Cattle.pdf> (last accessed 29. 9. 2021);
- Infoblätter Kälber-Transport, ISBN:978-92-79-81093-0, <http://animaltransportguides.eu/wp-content/uploads/2017/03/German-Calves-TransportFINAL2.pdf> (last accessed 29. 9. 2021).

BERNATZKY (1997): Bernatzky, G. in: Sambraus H.H. and Steiger, A., Das Buch vom Tierschutz [The Book of Animal Protection], Ferdinand Enke Verlag Stuttgart.

BOLT et al. (2017): Bolt, S. L., Boyland, N. K., Mlynski, D. T., James, R., Croft, D. P., Pair Housing of Dairy Calves and Age at Pairing: Effects on Weaning Stress, Health, Production and Social Networks, Doi: 10.1371/journal.pone.0166926, <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0166926#sec001> (last accessed 29. 9. 2021).

COM (2007a): SANCO D2 DS/dj D(2007) 420506 vom 9. 8. 2007 concerning loading and unloading times.

COM (2007b): SANCO D2 LPA/dj D(2007) 420763 vom 9. 1. 2008 concerning loading and unloading times.

COM (2009): Europäische Kommission: Langzeitbeförderung von nicht abgesetzten Kälbern und Lämmern / European Commission: Transport of unweaned calves and lambs on long journeys, SANCO D5 DS/dj D(2009) 450351; 4. 12. 2009.

COM (2017a): DG(SANTE) 2017-6107, Final report of an audit carried out in Germany from 26 June 2017 to 30 June 2017 in order to evaluate animal welfare during transport to non-EU countries.

COM (2017b): DG(SANTE) 2017-6108, Final report of an audit carried out in France from 09 October 2017 to 13 October 2017 in order to evaluate animal welfare during transport to non-EU countries.

COM (2020): SANTE G2/YSL/sc (2020)2868303, Subject: Interpretation of the definitions of the terms "transport" and "journey".

COM (2021): SANTE/G5/YSL/iv(2021) 512932, Subject: Fixing a minimum temperature under which live transport of animals should not take place.

CURIA (2007): Judgment of the Court (Second Chamber) 23 November 2006 In Case C-300/05, reference for a preliminary ruling under Article 234 EC by the Bundesfinanzhof (Germany), made by decision of 17 May 2005, received at the Court on 27 July 2005, in the proceedings Hauptzollamt Hamburg-Jonas v ZVK Zuchtvieh-Kontor GmbH.

DAVIS and DRACKLEY (1998): Davis, C. L., Drackley, J. K., The development, nutrition, and management of the young calf. Ames, Iowa State University Press. 79–89.

EFSA (2008): Project to develop Animal Welfare Risk Assessment Guidelines on Transport, <https://efsa.onlinelibrary.wiley.com/doi/abs/10.2903/sp.efsa.2009.EN-21>.

EFSA (2011): Scientific Opinion Concerning the Welfare of Animals during Transport, EFSA Journal 2011; 9(1):1966.

EFSA (2012): EFSA Journal 2012;10(6):2767–29, <https://www.efsa.europa.eu/de/efsajournal/pub/2767> (last accessed 29. 9. 2021).

EFSA (X): <https://www.efsa.europa.eu/en/topics/topic/animal-welfare> (last accessed 29. 9. 2021).

EHRlich (2003): „Muttergebundene Kälberaufzucht in der ökologischen Milchviehhaltung“ (Mother-bound calf rearing in organic dairy farming), Diploma Thesis, University Kassel, <https://docplayer.org/21125519-Muttergebundene-kaelberaufzucht-in-der-oekologischen-milchviehhaltung.html> (last accessed 29. 9. 2021).

FAWC (2019): Farm Animal welfare Committee (FAWC), Opinion on the Welfare of Animals during Transport, https://consult.defra.gov.uk/transforming-farm-animal-health-and-welfare-team/improvements-to-animal-welfare-in-transport/supporting_documents/fawcopiniononthewelfareofanimalsduringtransport.pdf (last accessed 30. 9. 2021).

FIORÉ et al (2019): Fiore G, Hofherr J, Natale F, Stifter E, Costanzi C., On-Farm Mortality in Cattle; EUR 24670 EN. Luxembourg (Luxembourg): Publications Office of the European Union; 2010. JRC62284.

GAYER et al. (2016): Gayer, R., Rabitsch, A., Eberhardt, U., Tiertransporte: Rechtliche Grundlagen, Transportpraxis, mit Prüfungswissen Befähigungsnachweis Tiertransport. Verlag Eugen Ulmer. ISBN-13: 978-3800174218.

HAFNER and RABITSCH (2016): Hafner, C., Rabitsch, A., The Myth of Enforcement of Regulation (EC) No. 1/2005 on the protection of animals during transport, A Documentation by Animals´ Angels. Animals´ Angels Press, Frankfurt/Main, ISBN: 978-3-9816696-4-0.

HERZOG et al. (2020): Herzog, K., Biedermann, M., Franzky, A., Zur Tierschutzproblematik beim Langstreckentransport von nicht abgesetzten Kälbern [On the animal welfare issues during long-distance transportation of unweaned calves], Berl Munch Tierarztl Wochenschr. [Berlin and Munich Veterinary Journal], Schlütersche Verl.-anst., DOI 10.2376/0005-9366-19023.

KASKE (2018): Kaske, M., „Metabolische Programmierung“ und die Konsequenzen für die Kälberaufzucht. wdt-news 3 /2018, <https://www.kgd-ssv.ch/file/newsletter/2021/Metabolische%20Programmierung.pdf> (last accessed 29. 9. 2021).

KTBL (2020): Kuratorium für Technik und Bauwesen in der Landwirtschaft e.V. (KTBL), Zapf, R., Tierschutzindikatoren Aufzucht-kälber, <https://www.ktbl.de/themen/tierschutzindikatoren-aufzuchtkaelber> (last accessed 29. 9. 2021).

MAISACK and RABITSCH (2018): Maisack, C. Rabitsch, A., Tiertransporte – Verlängerung der Beförderungsdauer durch illegales „Sammelstellen-Hopping“, Amtstierärztlicher Dienst und Lebensmittelkontrolle 25, 92-95.

MAISACK and RABITSCH (2019a): Maisack, C., Rabitsch, A., Zur Auslegung der Begriffe »Beförderung« iSv Art 2 lit j bzw »Beförderungsdauer« iSv Anhang I Kapitel V Nr 1.2 bis 1.9 der EU-Tiertransportverordnung (EG) Nr 1 / 2005, TiRuP – Tier- und Artenschutz in Recht und Praxis, DOI: 10.25598 / tirup / 2019-4.

MAISACK and RABITSCH (2019b): Maisack, C., Rabitsch, A., Zur Auslegung der Begriffe »Beförderung« iSv Art 2 lit j bzw »Beförderungsdauer« iSv Anhang I Kapitel V Nr 1.2 bis 1.9 der EU-Tiertransportverordnung (EG) Nr 1 / 2005, Amtstierärztlicher Dienst und Lebensmittelkontrolle 26, 200-206.

MARAHRENS and SCHRADER, (2020): Marahrens, M., Schrader, L., Tierschutz beim Transport [Animal Protection during transportation]: Technische Voraussetzungen für Langstreckentransporte nicht abgesetzter Kälber [Technical requirements for the long-distance transportation of calves which have not been weaned]. Friedrich-Loeffler-Institut, Bundesforschungsinstitut für Tiergesundheit [German Federal Institute for Animal Health], Institut für Tierschutz und Tierhaltung [Institute for Animal Welfare and Husbandry] (ITT), Celle; https://www.openagrar.de/servlets/MCRFileNodeServlet/openagrar_derivate_00027758/Empfehlung-Tierschutz-beim-Transport_2020-03-13.pdf (last accessed 29. 9. 2021).

MAY et al (2021): May, B., Rabitsch, A., Wessely, W. Tiergesundheitliche und tierschutzrechtliche Folgen innerösterreichischer Langstreckentransporte nicht-entwöhnter Kälber, TiRuP – Tier- und Artenschutz in Recht und Praxis, DOI: 10.35011/tirup/2021-10.

PADALINO et al. (2018): Padalino, B., Tullio, D., Cannone, S., and Bozzo, G., Road Transport of Farm Animals: Mortality, Morbidity, Species and Country of Origin at a Southern Italian Control Post *Animals* 2018, 8, 155; doi:10.3390/ani8090155.

PALMER ET AL. (2021): Palmer, A. L., Beausoleil, N. J., Boulton A. C., Cogger, N., Prevalence of Potential Indicators of Welfare Status in Young Calves at Meat Processing Premises in New Zealand, *Animals* 2021, 11, 2467. <https://doi.org/10.3390/ani11082467>.

RABITSCH (2014): Rabitsch, A., Tiertransporte – Anspruch und Wirklichkeit [Animal Transports – Requirement and Reality], Veterinärspiegel Verlag (schaefermuellerpublishing), ISBN: 978-3-86542-065-7, e-book ISBN: 978-3-86542-066-4.

RABITSCH (2020): Rabitsch, A., Zum Transport nicht-entwöhnter Kälber; Stabsstelle der Landesbeauftragten für Tierschutz – Julia Stubenbord, Ministerium für Ländlichen Raum und Verbraucherschutz Baden-Württemberg, Deutschland; https://mlr.baden-wuerttemberg.de/fileadmin/redaktion/m-mlr/intern/dateien/PDFs/SLT/2020-05-10_Gutachten_Rabitsch_Transport_nicht_entwoehnter_Kaelber.pdf.

RABITSCH et al. (2020):

- Rabitsch, A., Wessely, W., On Compliance with Driving Times and Rest Periods for Drivers in Connection with the Long-Distance Transport of Animals;
- Maisack, C., Rabitsch, A., Animal Transports – Prolongation of the Journey Time by Illegal “Hopping” between Assembly Centres;
- Maisack, C., Rabitsch, A., On the Interpretation of the Terms “Journey“ within the Meaning of Art. 2 (j) and “Journey Time“ within the Meaning of Annex I Chapter V No. 1.2 to 1.9 of Regulation 1/2005 on the Protection of Animals during Transport;

in: Live Animal Transport: Closing the Gap between EU Requirements and Enforcement, A Collection of Academic Articles on Compliance with the EU Council Regulation 1/2005 on the Protection of Animals during Transport; VIER PFOTEN International - gemeinnützige Privatstiftung (non-profit private foundation), 1150 Vienna.

RABITSCH and MARAHRENS (2020): Rabitsch, A., Marahrens, M., Anmerkungen zum Transport nicht-entwöhnter Kälber, Amtstierärztlicher Dienst und Lebensmittelkontrolle 27, 185-195.

RABITSCH and MARAHRENS (2021): Rabitsch, A., Marahrens, M., Remarks on the Transport of Unweaned Calves; in: Live Animal Transport: Closing the Gap between EU Requirements and Enforcement, A Collection of Academic Articles on Compliance with the EU Council Regulation 1/2005 on the Protection of Animals during Transport; VIER PFOTEN International - gemeinnützige Privatstiftung (non-profit private foundation), 1150 Vienna; https://media.4-paws.org/a/6/2/a/a62a3b2b4d4afe67c202496d7dca597e3de4d1669/Animal_Transport_EN.pdf (last accessed 29. 9. 2021).

RABITSCH and WESSELY (2012a): Rabitsch, A., Wessely, W., Zur Beachtung der Lenk- und Ruhezeiten der Fahrer im Zusammenhang mit Langstreckentransporten von Tieren. Amtstierärztlicher Dienst und Lebensmittelkontrolle 19, 99-109.

RABITSCH and WESSELY (2012b): Rabitsch, A., Wessely, W., On compliance with driving times and rest periods for drivers in connection with the long-distance transport of animals. [http://eurogroupforanimals.org/files/news/downloads/422/lrz-vo tt-vo rabitschwessely en eurogroupforanimals080612.pdf](http://eurogroupforanimals.org/files/news/downloads/422/lrz-vo_tt-vo_rabitschwessely_en_eurogroupforanimals080612.pdf).

ROADKNIGHT et. al (2021): Roadknight, N., Mansell, P., Jongman, E., Courtman, N., Fisher, A., Invited review: The welfare of young calves transported by road, J Dairy Sci 2021 Jun; 104(6):6343-6357, doi: 10.3168/jds.2020-19346. Epub 2021 Mar 11.

SIMOVA et al. (2016): Simova, V., Voslarova, E., Passantino, A., Bedanova, I., Vecerek, V., Mortality rates in different categories of cattle during transport to slaughter, Berliner und Münchener Tierärztliche Wochenschrift 129, 462-467.

VECEREK et al. (2006): Večerek, V., Šimova, V., Malena, M., Voslářová, E., Malena, M., Effect of calf diseases on mortality during transport for slaughter, Acta Vet, Brno 2006, 75: 625–630; doi:10.2754/avb200675040625.

VELARDE et al (2021): Velarde, A., Teixeira, D., Devant, M., Martí, S., Research for ANIT Committee – Particular welfare needs of unweaned animals and pregnant females, European Parliament, Policy Department for Structural and Cohesion Policies, Brussels; IPOL_STU(2021)690874_EN_unweaned_calves.pdf; <https://research4committees.blog/2021/05/20/particular-welfare-needs-in-animal-transport-unweaned-animals-and-pregnant-females>.

WATTS (2001): Watts, J. M., Vocal Behaviour as an indicator of welfare in cattle, Doctor Thesis, University of Saskatchewan.

WELFARE QUALITY (2009): Welfare Quality report No. 11, Forkman, B, Keeling, L, Assessment for Animal welfare Measures for Dairy Cattle, beef Bulls and Veal Calves, <http://www.welfarequality.net/media/1121/wqr11.pdf> (last accessed 29. 9. 2021).

ZAR (2019): Transport of calves using the example of a long-distance journey from Bergheim to Vic in Spain on 24 and 25.06.2019, https://zar.at/Aktuelles/Archiv/2019/20190904_Kurzfilm-zum-Thema-K%C3%A4lbertransport.html,

<https://www.youtube.com/watch?v=eZXTdpgk7VA&feature=youtu.be> (last accessed 30. 9. 2021); ZAR = Zentrale Arbeitsgemeinschaft der Rinderzüchter Österreichs. [Central Working Group of Austrian Cattle Breeders] zar.at = Rinderzucht Austria [Cattle breeding Austria].

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