Work Package 2

Deliverable 2.3

Report addressing the risks to animal welfare of specific management and housing aspects at CPs

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The project "Renovation and promoting high quality control posts in the European Union" foresees a significant improvement of the equipment as well as the management of 12 Control Posts (CPs) located at the cross roads of important flows of animals transported over long journeys in the EU.

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INTRODUCTION

The general purpose of the obligatory use of Control Posts during long animal transport is to protect the animals during transport, and provide them with feed, water and rest, under adequate housing and management conditions. Besides animal based measures to assess welfare of animals in a CP, the protocols developed for this project also contain a set of management and resource based parameters to be used during unloading, while resting in the CP and during loading before departure. An overview of the parameters is given in Table 1.

Table 1 Welfare principles and criteria identified in Welfare Quality® and their respective resource and management based measures used in the first version of the control posts protocol.

		Welfare Criteria	Measures	Unloading	Resting in the CP	Loading
Good	1	Absence of prolonged hunger	Feed provision Live weight recovery	- x	x -	- x
	2	Absence of prolonged thirst	Water supply	-	x	-
Good housing	3	Comfort around resting	Time at (un)loading. Flooring, bedding	x -	- x	x -
	4	Thermal comfort	Thermal adequacy	-	x	-
	5	Ease of movement	General facilities: Flooring, corridors, ramp etc Space allowance	x -	- x	- -
Good health	6	Absence of injuries	Sharp edges (Un)loading management	x -	x -	- x
	7	Absence of disease	-	-	-	-
	8	Absence of pain	-	-	-	-
Appropriate	9	Expression of social behaviours	-	-	-	-
	10	Expression of other behaviours	-	-	-	-
	11	Good human-animal relationship	-	-	-	-
	12	Absence of fear	-	-	-	-

Table 1 shows that not all relevant criteria are assessed with management and resource based measures. Particularly those related to health and behaviour are not covered, as these should mainly be assessed with animal based parameters. In this report the results for the resource and management based

parameters are presented and commented. Moreover, the links of these parameters with the observed animal based parameters have been investigated.

Live weight recovery

The protocol developed to assess welfare in the CPs included live weight recovery as a potential parameter to monitor the animals. For this parameter the truck should be weighed directly before unloading and directly after reloading, and preferably also directly after unloading and before reloading. This requires that the CP has a scale for weighing trucks, and that the truck is weighed four times. The latter two weightings enable to calculate the total live weight of the animals on arrival and departure, and are not influenced by e.g. filling of water and fuel tanks before departing from the CP. If the truck is only weighed before unloading and after reloading the difference is not a good estimate of live weight recovery. .

The figures in **Errore. L'origine riferimento non è stata trovata.** show that most CPs that accommodate cattle do not use a truck weighing scale, and for those who do the figures are not comparable. Although weight recovery has to be considered a relevant parameter for animal welfare in a CP, unfortunately it has not been possible to measure this.

Unloading and loading

Unloading started 11 ± 14 minutes after arrival of the truck at the CP for cattle and nearly immediately for pigs, but the longest interval for cattle was nearly 2 hours. This is a very unfavourable situation, because the animals should be unloaded and rest in the CP as long as possible during the stop. A good communication between the transporter and the CP is a prerequisite for quick unloading, and for high quality CP's it should be a standard procedure to start with unloading directly after arrival if the driver has announced his arrival in time.

Unloading duration for cattle on average was 24 ± 18 minutes, so again variation was considerable: between 5 minutes and over 2 hours were the minimum and maximum durations recorded. Partly the variation could be related to the different categories and numbers of animals transported: calves, heifers or steers. However, the variation within animal categories and CP's is bigger than between animal categories (

Table 2).

Table 2 Average unloading duration for cattle (minutes)

Control Post	avg	min	max	Animal category	# assessments
Bardy	11	7	25	Steers	16
Miranda	10	8	11	Heifers	3
Prioglio	25	10	75	Calves	18
Qualivia	34	5	143	Calves*	21
Wacht	33	20	60	Heifers	13
Zbuczyn	18	10	30	Heifers	13

*also a few heifer transports assessed

The variation within CP's indicates that other factors besides infrastructure also determine the unloading duration. After renovation the unloading duration on average was longer (29 minutes) than before renovation (19 minutes). Loading duration (28 ± 15 minutes for cattle) was similarly increased after renovation, with only a decrease for Prioglio. Enlargement of the facilities, or the unfamiliarity with the new facilities may have caused an increase of unloading and loading duration after renovation, as is suggested by an increase of the average maximum length of the corridor path to the pens from 31 m before renovation to 45 m after renovation. For pigs in Zbuczyn there was less variation in duration of unloading (avg 24 minutes, min 15 and max 30 minutes) and loading (avg 24 minutes, min 10 and max 40 minutes). There was a positive correlation (r=0.45) between unloading duration and loading duration, which indicates that longer unloading times generally coincided with longer loading times.

(Un)loading duration and ramp characteristics

It was found that the correlation coefficient between unloading duration and slope of the ramp was positive (r= 0.30), which illustrates that steeper ramps on average coincided with longer unloading duration. Moreover, ramp slope was positively correlated with percentages of animals falling (0.24 and 0.11 for unloading and loading respectively), thus steeper ramps also coincided with more animals falling. This is in line with literature (e.g. Dalla Villa et al., 2009). The correlation of ramp slope with loading duration was lower (0.11), which suggests that the effect on loading is smaller. However, it is to be expected that steeper ramps also coincide with impaired loading. To smoothen the unloading's it is therefore recommended that CPs have facilities to minimize the ramp slope during unloading and loading for the types of trucks that make a stop. In many renovated CPs the ramps have been improved or a mobile ramps have been purchased by the CP owners.

For none of the assessments a counter slope was recorded, which is as desired. Lateral protections at the ramp were often a little below the value recommended for adult cattle (150 cm), but for pigs they were always higher than the minimum recommendation of 80 cm. This however is probably not the responsibility of the CP, but of the transporter. Similarly, predominant ramp width for the cattle unloading's was usually lower than 250 cm (average: 184 cm), but this is still sufficient to let most animals pass in pairs and is determined by the truck dimensions. Nearly all ramp floors were of some kind of anti-slip material, mostly corrugated metal. The ramps for cattle were not always covered with straw: the average unloading duration was longer when the ramp was not covered (33 ± 33 min) compared to when straw was used to cover the ramp (23 ± 13 min), but this was primarily influenced by one unloading that took more than 2 hours (143 min). There was no difference in unloading duration between complete and incomplete ramp coverage.

Holes, damaged areas, poor drainage or sharp edges in the ramp floors did not occur which indicates that the trucks were in a good state of maintenance. Despite this, slipping areas did occur for some cattle unloading's but these were not related to prolonged unloading or loading duration. However, slipping areas were related with increased percentages of animals slipping (12.9 and 9.1 % when recorded vs. 7.5 and 3.9 % when not recorded for unloading and loading respectively). Only one CP (Wacht) had a roofed unloading area, so this is not common for CP's. Although it is suggested that a roof covering the (un)loading area could be beneficial to ease unloading, our data do not indicate if a roof can help to reduce unloading time and if this depends on weather and sunlight conditions. All ramps had foot battens with average interspace of 21 cm (range between 14 and 30 cm) and height of 3.4 (range from 2 - 6) cm for cattle and interspace of 14 and height of 2 cm for pigs. An interspace of 20 – 30 cm is recommended for cattle and 20 cm for pigs (Dalla Villa et al., 2009), so foot batten interspace in practice may be below optimum values. Mostly the foot battens had a rectangular shape, otherwise they were squared. Rounded shape was recorded in 3 instances for cattle.

A gap between the lorry doors and the lateral protections was recorded in 4 cases for cattle and 9 for pigs. The width ranged from 20 to 110 cm for pigs and between 10 and 139 cm for cattle. For 58% of the cattle unloading's and 56% of the pig unloading's a step between the lorry floor and the ramp was present with an average height of 13 cm (range 5 – 22 cm for cattle and 10 – 15 cm for pigs). The unloading's and loadings without a step on average were somewhat quicker (22 and 25 min respectively for cattle and 21 and 21 minutes for pigs) than those with a step (26 and 30 minutes respectively for cattle and 26 and 26 minutes for pigs). Step height was not correlated with unloading duration, so probably the steps between the lorry floor and the ramp did not hamper unloading.

A step between the ramp and the floor of the loading area was present for 62% of the cattle unloading's, with an average height of 8 cm (range 5 – 15 cm). Unloading duration without a step (24 ± 21 min) was hardly different from duration with a step (25 ± 14 min). For pigs no steps between the ramp and the floor of the unloading area occurred. Gaps between the ramp and floor of the unloading area did not occur for any unloading. When light was needed in the unloading area (23% of the unloading's) it was always working. A lift was not present in any of the CP's.

(Un)loading duration and corridor characteristics

Lateral protections in the corridors were on average 148 cm (range: 100 – 177) high for cattle and 121 cm before and 160 cm high after renovation for pigs. For cattle there often were openings at the top of the protections, whereas for pigs the protections were solid. For cattle the recommendation in the handbook with regard to height of the protections was not always met.

Recorded predominant corridor width for cattle on average was 148 cm (range: 100 – 290 cm), but differed between CP's. For pigs the average value was similar (145 cm with a range between 130 and 205 cm). The recommended values for adult cattle (90 – 250 cm) are usually met, and also for pigs the corridor width is sufficient to let the animals pass in pairs, although narrower parts do occur. The correlations of unloading duration and loading duration with recorded predominant corridor width for cattle are negative (-0.34 and -0.39 respectively), which suggests that wider corridors coincide with faster unloading. Minimum and maximum widths are reported too infrequently too look into this in more detail.

. For the pig assessments no holes or discontinuities were recorded. In 26% of the cattle unloading's one or more protrusions or sharp edges in the corridor were recorded, either in the lateral walls or barriers (15%) or the floor (10%). Skin lesions (assessed in the resting pens) were rare before renovation (0.5 % of the cattle had one or more lesions after unloading), but after renovation this was only 0.1%. This suggests that improvements in the infrastructure contributed to less skin lesions.. Wounds were also rare for the pigs, and could be a result of fighting. When light was needed in the corridor this always worked (as was the case for the resting pens).

Animal handling

For 18% of the cattle unloading's it was recorded that the handler was not moving calmly, but the unloading and loading duration were very similar for calm and excited handling. This suggests that excited handling does not speed up unloading, but it cannot be excluded that some assessors misinterpreted the recording form and entered a "yes" while the handler was moving calmly. For pig unloading's it was never recorded that the handler moved not calmly!

Shouting handlers were recorded for 25% of the cattle unloading's and never for the pig unloading's. Shouting handlers coincided with longer average unloading and loading duration (28 and 33 min for shouting handlers and 23 and 27 minutes for non-shouting handlers respectively). This suggests that shouting does not fasten the unloading procedure, but it could also be that shouting occurs when the

animals are not willing to move. Similarly unloading and loading duration were longer (29 and 40 min vs. 24 and 26 min) when slapping or hitting occurred (13% of the cattle unloading's, this did not occur for the pig unloading's). When the handler was recorded to be not properly positioned (8% of the cattle unloading's) the durations of both procedures also were longer: 44 and 41 min vs. 22 and 27 min. For pig unloading wrong positioning was recorded for 88% of the assessments. An example of wrongly positioned handlers is when animals and drivers were moving in opposite directions. This indicates that proper positioning is a point that deserves attention from CP staff. Remarkably, there were also 7% of cattle unloading's where forbidden practises were recorded. This indicates that continuous attention for prevention of such practises at CP's is necessary. There were however no clear differences in percentages of animals slipping or falling during loading between good and bad handling practices.

Resting pens

Feed is available either directly (58% of the cattle arrivals) or within an hour after arrival (nearly all pig arrivals and the remainder of the cattle arrivals). There are no clear differences between categories of cattle with regard to feeding directly or after the animals entered the pens. However, a remarkable difference was that for all calf transports at Prioglio feed was reported to be available immediately and for Qualivia it was reported to be available within an hour after arrival but not immediately. Intervals between last feed availability and departure from the CP are not recorded, and the handbook does not give recommendations other than amounts to be fed derived from farming recommendations. The amount and quality of feed to be fed may also depend on the final destination of the animals: if this is a slaughterhouse it is better to restrict feeding to a minimum to reduce gut fill before slaughter. Because we found no good animal based indicators to assess the nutritional status, the lack of resource based indicators such as weight recovery or amount of feed ingested implies that it is not possible to monitor and compare high quality CP's with a standard for the welfare principle "good feeding". An option could be to compare the number of animals feeding at a fixed interval after unloading.

To assess water supply four aspects of the drinkers in the pens are taken into account: their functionality, number, cleanliness and height. The drinkers are almost always functioning, but before renovation the number of drinkers sometimes was not considered sufficient according to the requirements for high quality CP's (Ferrari and Rossi, 2012). Therefore, one of the improvements during the renovations was to increase the number of drinkers for these pens and after renovation all pens have sufficient numbers of drinkers. All drinkers assessed were clean, and their height was in line with the recommended maximum heights for the categories that were accommodated. When young unweaned calves are housed in a CP, it should be prevented that they drink too much cold water. For this category of animals water temperature should be controlled. As also mentioned for nutrition, there is a lack of animal based indicators to assess the adequacy of water provision and intake, but if water is available ad libitum in well accessible drinkers insufficient intake is unlikely (unless something is wrong with water quality or taste).

Access angles to the pens should be as small as possible, and the gates sightless to ease the pen entrance. The assessments showed that maximum access angles of 0° are relatively rare (recorded for 17% of the cattle arrivals), most angles (79% and 88% of the cattle and pig arrivals respectively) are between 0 and 90°. The angles of 0° coincided with slightly shorter duration of unloading and loading (23 min for both) than angles between 0 and 90° (25 and 30 min respectively). This suggests that reduction of the access angles can reduce (un)loading time, although the figures may be affected by other factors. For the pig unloading's all pen entrances were sightless, but for cattle sightless entrances were only recorded for Bardy, Qualivia and Zbuczyn. The average unloading duration for these CP's was somewhat shorter (23 min) than the unloading duration for the other CP's (27 minutes), but this is not necessarily a result of the sightless entrances.

All pens are roofed and where necessary have been insulated during renovation In order to assess the thermal adequacy in the pens it was tried to measure barn or pen temperatures at animal level. Particularly for the cattle assessments this parameter is often missing, because there was no thermometer available. Moreover, it is concluded that it is better to assess thermal comfort for the animals through animal based parameters (e.g. sweating, shivering, panting, huddling) and availability of heating and ventilation systems because next to air temperature many other factors (e.g. bedding, flooring, humidity, ventilation and outside temperatures) affect the thermoregulation of the animals. Nevertheless, the availability of a thermometer in the barn can help to manage the climatic conditions when mechanic ventilation or heating systems can be used. Because of their lower tolerance to thermal changes, this is more relevant for CP's that accommodate pigs than cattle.

A heating system is present and functioning only in the Zbuczyn CP, where both cattle and pig transports have been assessed. The absence of heating systems in the other CP's is related to the climatic conditions where they are located (mostly extreme cold is very unlikely) and also to the tolerance of cattle. The CP's that accommodate calves or piglets can also use infra-red lamps or other devices to warm the animals. All CP's have static natural ventilation in the barns, in a few cases a forced ventilation system is reported to be present and functioning, but in most of the CP's involved in this project forced ventilation is considered unnecessary (Ferrari and Rossi, 2012).

The amount of bedding in the pens was usually sufficient to not see the underneath floor, but in some cases (particularly for Zbuczyn before renovation) the amount was less. After renovation this CP used sufficient bedding material and this may have improved the recovery of the animals. In all cases clean and dry straw or wood shaving is used as bedding material. For some CP's (Wacht and Zbuczyn) the pens are enlarged during renovation, so the animals get more space if the number per pen remains the same. From the data recorded it is not clear however how much pen space the animals have on average, but sufficient pen space and flexible grouping facilities (to avoid mixing in the CP) are beneficial for the animals recovery.

The temperature of milk in the nearest baby feeder was consistently lower for Prioglio (around 27 °C) than for Qualivia (around 40 °C). Values for further milk feeders were not reported consistently, but when reported they corresponded well with those for the nearest feeder. It is recommended that milk replacer is provided for the animals at optimal temperatures.

Discussion and recommendations

Although the renovations seem to have improved the animals' welfare (see Deliverable 2.2)) the data obtained do not indicate which specific management or housing aspects are related to this improvement. More space but also better water and feed availability have contributed to this result. However, also before the renovations took place welfare of animals in the CP's that participated in this project was not endangered and the owners are motivated to achieve good animal welfare. So probably both the variation in resource circumstances and handling and in the welfare status of the animals that arrived in the CP's was limited. Another reason limiting the possibilities of risk assessment with the data obtained in this project is that the animals that arrived at the CP's and were assessed generally were healthy and only had to feed, drink and rest. Part of the renovation activities are directed towards improved biosecurity. Of course, reduction of the risk of spreading infectious diseases is beneficial for animal welfare, but for individual transports this will usually not be measurable. The biggest improvement of animal welfare probably can be achieved for those transports that currently do not visit a CP whereas they should if they would comply with legislation. Particularly in this respect, improvements of CP's with regard to biosecurity and facilities for drivers could have indirect benefits for animal welfare, because these can encourage transporters to stop at high quality CP's.

Good facilities are important prerequisites for good animal welfare and the analysis of the animal based parameters has demonstrated than an improvement of these parameters occurred due to the renovation of these facilities. However, our experiences have also shown that even with the same facilities different levels of welfare can be achieved which points to the necessity of good animal handling. Reliable animal based parameters that can be scored visually to assess nutritional status, water balance and fatigue of the animals are not available. During the pre-renovation interview one of the CP owners stated that he used weight recovery as a monitoring tool, but during the assessments it is experienced this is not common. As a result, there are no reliable benchmarks for weight recovery. This implies that CP's cannot show how the animals they accommodate perform compared to those in other CP's or compare animals from different transports within the same CP. In general, self-monitoring tools for CP owners to evaluate the status of the animals during their stay in their facilities currently are not available.

During the assessments it is experienced that holes or sharp edges in corridors do occur every now and then, and these can result in wounded animals. Regular checks of the resources and interventions can minimise their impact. Narrow corridors can hamper the unloading and loading procedures, but too wide corridors can cause animals to turn back. Therefore it is advised to adapt the corridors if they are not in line with the recommendations, and observe the flow of animals critically to judge if modifications can be useful. Because unwanted handling does occur, and not only is not beneficial for the operation but also can impair animal welfare, it is recommended to regularly pay attention to handling. Because flexible pen size is promoted to be able to accommodate groups of animals of variable size and thus to prevent mixing of animals, sufficient availability of drinking places deserves extra consideration. When CP's are renovated or newly designed the length of paths from unloading to the pens should be taken into account when designing the layout, and it should be aimed to restrict their length as much as possible. Otherwise (un)loading time can increase, which is unfavourable for animal welfare. For high quality CP's it should be a standard procedure to start with unloading directly after arrival of a truck, but this also requires good communication from the side of the transporter. Because steep ramps hamper unloading, the CP's should have devices that can minimize ramp angles.

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