

Protection of Animals against Cruelty: Transport of Cattle, Sheep, Goats and PigsJ. DOUSEK¹, V. VEČEREK², O. VALCL¹, P. CHLOUPEK², V. PIŠTĚKOVÁ²¹State Veterinary Administration, Prague, Czech Republic²University of Veterinary and Pharmaceutical Sciences, Brno, Czech Republic

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Abstract

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The inspections carried out by the officers of the State Veterinary Administration (SVA) within the framework of surveillance of animal transport revealed that cases of violation of the principles of animal protection may and do occur. Therefore evaluation was made of transport in selected groups of cattle, sheep, goats and pigs in the Czech Republic during the period of 1996 to 2001. Each inspection was assessed using the following scale: (1) animal protection requirements fulfilled, (2) animal protection requirements partially fulfilled and veterinary measures for the improvement of animal protection imposed, (3) failure to fulfil animal protection requirements. The proportion of the situations of when animal protection requirements were partially met and veterinary measures were imposed to improve the level of protection in cattle varied between 0.00% and 1.35% of the total number of the inspections carried out. In sheep and goats this situation occurred only sporadically. In pigs the proportion was 0.22% to 2.22% of the total number of the inspections carried out. The proportion of the situations when failure to fulfil animal protection requirements in cattle occurred varied between 0.00% and 0.83% of the total number of the inspections carried out. In sheep this situation occurred in a single case only and in goats no such situation was recorded. In pigs the same proportion varied between 0.00% and 3.31%. We compared the results of the period 1996 to 1998 with the period of 1999 to 2001. The proportion of the situations with partial fulfilment of animal protection requirements and subsequent necessity to impose veterinary measures increased in cattle from 0.53% to 0.82% and in pigs from 0.65% to 1.09%. The proportion of the situations of failure to fulfil animal protection requirements increased in cattle from 0.00% to 0.37%, and in pigs from 0.33% to 1.33% showing a significant trend towards deterioration of these conditions ($P = 0.0406$). The results obtained by this detailed analysis show that animal protection has not improved in the interval under study. Our evaluation further shows that it is inevitable to continue the supervisory activities by SVA inspectors and to improve all aspects of animal protection as well as amend the standing legislation.

Cattle, pigs, transport, animal protection, surveillance

Loading, transport and unloading of animals cause unusual stress for them. The animals are forced to move, often by means of various painful stimulations, the structure of animal groups is changed and the animals are exposed to considerable physical and emotional stress due to unusual circumstances of the environment (visual perceptions, noise, smells, changes in temperature, humidity and other components of microclimate, changes of the properties of floor, movements of the vehicle, changes in the centre of gravity, vibrations, changes in feed and water supply and other unusual circumstances). This leads to changes in behaviour and in physiological indices including biochemical and physiological changes which can be observed and which also influence animal products. Therefore the conditions of animal transport are controlled by legal regulations which are based on scientific knowledge and experience. Thus the most prominent forms of cruelty, suffering and injury of the animals are limited as well as the cases of death during transport (Grandin 2000). However, the fulfilment of the legal regulations has to be inspected and enforced if necessary. According to Texdorf (1993) the systematic surveillance of animal protection should be guaranteed

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by veterinarians. Troeger (1996) emphasised the necessity of an appropriate legal framework for the area of animal transport. Similarly, Sojka (1992) considered legal regulation of animal transport to be a very important aspect of animal protection, especially with regard to long-distance shipments. The regulations of the European Union prescribe higher standard of the means of transport for the transport of animals exceeding 8 hours. For instance Kettlewell et al. (2001) developed a prototype of a ventilation system inside the vehicle which is independent on its movement. This system was confirmed as suitable for the transport of pigs in the European Union. Meyen (2000) reported that the numbers of animals transported abroad from Germany are 4.1 million of pigs, 0.6 million of calves and 0.3 million of adult cattle. The same author also underlines the fact that the improvement of the conditions for animals in transport had been initiated by EU regulations in 1990.

Troeger (1965) reported that the parameters that influenced animal welfare and the quality of products of cattle and pigs included the equipment for loading and unloading, vehicle type and equipment, density of transported animals, time of transport and way of driving. According to Fischer (1995) the transport causes always stress for cattle and pigs, since numerous stressors are present. The influence of long-distance transport (10 to 15 hours) of cattle on biochemical indices (for instance on cortisol concentrations) was studied by Warriss et al. (1995). The authors have shown that castrated bulls were losing weight during transport. On the basis of biochemical indices detected and subjective observation the authors do not recommend to exceed the period of 15 hours in transport of cattle. Similarly Tadić et al. (2000) reported that the transport of cattle exceeding 36 hours was not appropriate with regard to animal protection requirements. This conclusion was supported by the fact that increased blood concentrations of cortisol and glucose were detected until the time of slaughter. Tarrant et al. (1992) studied the influence of density of transported bulls on behaviour, haematological and biochemical indices and meat quality. After a 24-hour transport of bulls they detected increased levels of cortisol, and glucose, increased red blood cell and neutrophil counts and decreased numbers of lymphocytes and eosinophils. Numbers of bruises increased with higher numbers of animals loaded. The authors concluded that the density of animals in transport exceeding 550 kg per sq m is unsuitable for slaughter bulls. Gallo et al. (2000) found that the transport during the period of 24 h leads to higher losses of live weight, increased numbers of bruises and more animals recumbent after falling down than during shorter trips of 3, 6 and 12 h. It was also found that transport may increase the occurrence of DFD meat. Villarroel et al. (2001) examined critical elements in cattle transport in Spain with regard to animal protection. The authors found appropriate equipment and time of loading. However, only few staff members had special training and many of them used electric devices to handle the animals. The transport took on average 3.5 h. However, in cases of international shipments the distances and the duration of transport were considerably longer (for instance in cases of shipments to Italy). The protection of against the influence of climate was insufficient. There were no inspections carried out in order to prevent damage to the animals and the equipment of the vehicles was not inspected either.

Steinhardt (2001) compared the values of heart rate, plasma cortisol and other parameters in calves prior to, during and after the transport. The author reported increased heart rate in the calves during loading and in the beginning of transport. Plasma cortisol was increased after transport in calves and other changes were also found in the indices of the internal environment of the animals. Grigor et al. (2001) observed calves during transport which consisted of two trips of nine hours each. The calves in transport spent less time lying and had higher plasma cortisol values than the calves in control group.

Selected blood indices of sheep in transport were evaluated by Broom et al. (1996).

During 15 h of transport the authors collected blood from sheep at 30-minute intervals. They found that loading and the beginning of transport increased in particular cortisol levels and heart rate. Similar results were presented also by Knowles et al. (1995) who reported increased heart rate, plasma cortisol and glucose levels due to stress at loading and during the initial phase of transport. The weight of the sheep decreased with prolonged transport. Cockram et al. (1996) studied the influence of space available during transport upon the behaviour and physiological indices in sheep. The authors concluded that the area of 0.22 sq m per animal could not be recommended as sufficient for the sheep weighing 35 kg. The area of minimum 0.27 sq m per animal may be sufficient to enable the sheep to lay down during transport. Increased heart rate and plasma cortisol levels were considered to be the indicators of stress in the sheep during transport. These values were higher than in the sheep that were not transported. Parrott et al. (1999) implanted a biotelemetric device for measurement of internal body temperature into four young ewes and four rams. They reported that loading of animals and transport of 2.5 h increased their internal body temperature that remained increased for several hours. The authors concluded that the increased body temperature and the changes in temperature cycles indicated stress and compromised well-being of the animals. Parrott et al. (1998) also monitored heart rate and concentrations of cortisol, prolactin, and catecholamines during loading and transport of sheep. They found that during loading the heart rate increased but cortisol concentrations remained unchanged. However, during transport the concentrations of plasma cortisol increased and reached a maximum within two hours. The authors assumed that in sheep the transport itself caused more stress than the process of loading itself. Jackson et al. (1999) and Cockram et al. (2000) studied the behaviour of sheep, especially with regard to lying and consumption of hay and water during the transport and afterwards. Cockram et al. (1999) reported that during a 16-h transport sheep were lying less than animals that were not transported. Stress in sheep with regard to their transport in socially mixed groups was studied by Hall et al. (1998a). Hall et al. (1998b) also studied the influence of noise and vehicle movement on the behaviour of the sheep and their biochemical indices of stress. The authors found that the movement of the vehicle may cause discomfort for the sheep, especially in the situation when density of the sheep is lower (the area of 0.41 sq m per one sheep). The noise from the environment did not affect their biochemical indices. Kent (1997) reported that transport was a multifactorial stressor for sheep. If they are stressed especially at the beginning of the journey, they will soon adapt to the situation, provided they have sufficient area (more than 0.25 sq m) available for lying.

Transport stress in goats was described by Nwe et al. (1996). These authors studied the influence of a 6-h transport on plasma concentrations of catecholamines, cortisol, glucose and on the eosinophil count. During transport of goats they recorded different manifestations of nervousness and excitement. The concentrations of plasma what increased within 30 min after the beginning of the transport. Plasma cortisol was increasing during the first hour of transport while plasma glucose was increasing during the first three hours of the transport. Eosinophil count decreased immediately after the beginning of transport and reached minimum values at the end of the transport. Their results showed that the crucial stage of the transport with regard to transport stress in goats was its initial period. Afterwards the adaptation mechanisms began to become effective and to reduce manifestations of transport stress.

Warris (1998) reported that during transport pigs experienced physical and emotional stress. Their weight decreased. The concentration of catecholamines and cortisol increased as well as their heart rate. Other indices of the internal environment were also changing and the animals might even die. The stress was influenced by genetic predisposition of the

animals, mode of handling, density of loading, ambient temperature and by other factors as well. Lambooy and Engel (1991) also studied the influence of animal density, ventilation and sprinkling the animals during 25 h of transport in pigs. The influence on animal well-being and on meat quality was observed. Interactions between animal density, ventilation and sprinkling of the pigs during the transport and several meat quality indices were found. Based on the results of this work they recommended a maximum transport density of 232 kg/sq m in order to ensure animal well-being and meat quality. According to Gade and Christensen (1998) the density of the pigs loaded for transport had only little influence on blood indices and meat quality in slaughter pigs. However, the influence of density upon the behaviour of the pigs during the transport was considerable, as well as upon different damages to the skin suffered during the transport. The relation of animal well-being and meat quality in the pigs was emphasised by Schutte et al. (1994). The authors proposed penalties for the violation of animal well-being during the transport.

Table 1
Numbers of inspections, veterinary measures imposed and cases of total failure to fulfil the requirements or the protection of cattle, sheep, goats and pigs in transport

	Numbers of inspections	Numbers of veterinary measures	Cases of failure to fulfil the requirements
Cattle			
1996	54	0	0
1997	287	1	0
1998	410	3	0
1999	416	0	0
2000	481	5	4
2001	444	6	1
Sheep			
1996	14	0	0
1997	7	0	0
1998	3	0	0
1999	13	0	0
2000	15	1	1
2001	11	0	0
Goats			
1996	7	0	0
1997	4	0	0
1998	6	0	0
1999	10	0	0
2000	20	0	0
2001	9	0	0
Pigs			
1996	45	1	1
1997	233	1	1
1998	337	2	0
1999	446	1	0
2000	414	4	3
2001	423	9	14

Materials and Methods

Transport of cattle, sheep, goats and pigs in the Czech Republic during the period of 1996 to 2001 was monitored with regard to animal protection against cruelty. The inspectors of district offices of the State Veterinary Administration carried out inspections of the animals in transport and means of transport. Each inspection was assessed and categorised as follows: (1) animal protection requirements fulfilled, (2) animal protection requirements partially fulfilled and veterinary measures to improve the protection of animals imposed, (3) failure to fulfil animal protection requirements. The numbers of veterinary measures were determined as well as the numbers of unfulfilled requirements in different years of the study. Furthermore the numbers of the inspections, veterinary measures imposed and cases of failure to fulfil the requirements for the protection of cattle, sheep, goats and pigs during the periods 1996 to 1998 versus 1999 to 2001 were determined in order to evaluate recent changes in the conditions of animal protection. The results were statistically evaluated using χ^2 test and the computer software Unistat.

Results

Table 1 shows total numbers of inspections, numbers of cases when veterinary measures for the improvement of animal protection of cattle, sheep, goats and pigs were imposed, and numbers of cases of failure to fulfil animal protection requirements for cattle, sheep, goats and pigs. The results indicate that the necessity to impose veterinary measures to improve the level of protection in cattle varied between 0.00% and 1.35% of the total number of the inspections carried out. In sheep only one such case was recorded and in goats no such case occurred. In pigs it varied between 0.22% and 2.22% of the total number of the inspections carried out. The proportion of failures to fulfil animal protection requirements in cattle varied between 0.00% and 0.83% of the total number of inspections carried out. In sheep a single case was noted, and in goats no such situation was recorded. In pigs this proportion varied between 0.00% and 3.31%.

Table 2 shows total numbers of inspections, numbers of cases when veterinary measures

Table 2

Comparison of the data on the transport of cattle, sheep, goats and pigs (total number of inspections, number of cases when veterinary measures were imposed, number of cases of total failure to fulfil animal protection requirements) between the two periods

	Numbers of inspections	Veterinary measures		Cases of failure to fulfil the requirements	
		Number	%	Number	%
Cattle					
1996 to 1998	751	4	0.53	0	0.00
1999 to 2001	1341	11	0.82	5	0.37
Evaluation	-	P = 0.4544		P = 0.0939	
Sheep					
1996 to 1998	24	0	0.00	0	0.00
1999 to 2001	39	1	2.56	1	2.56
Evaluation	-	P = 0.4291		P = 0.2596	
Goats					
1996 to 1998	17	0	0.00	0	0.00
1999 to 2001	39	0	0.00	0	0.00
Evaluation	-	-		-	
Pigs					
1996 to 1998	615	4	0.65	2	0.33
1999 to 2001	1283	14	1.09	17	1.33*
Evaluation	-	P = 0.3538		P = 0.0406	

for the improvement of animal protection of cattle, sheep, goats and pigs were imposed, and numbers of cases of failure to fulfil animal protection requirements for cattle, sheep, goats and pigs separately for the periods of 1996 to 1998 and 1999 to 2001. The results indicate that the necessity to impose veterinary measures in order to improve the protection increased in cattle from 0.53% to 0.82%. In sheep the necessity to impose veterinary measures occurred in a single case only during the second period while in goats no such case occurred in either of the two periods studied. In pigs veterinary measures imposed increased from 0.65% to 1.09% of the cases. The proportion of failure to fulfil animal protection requirements increased in cattle from 0.00% to 0.37%. In sheep there was a single case of total failure to fulfil the requirements for animal protection during the second period while in goats no such case occurred in either of the two periods studied. In pigs total failures to fulfil animal protection requirements increased from 0.33% during the first period to 1.33% during the second period. The increase in the number of cases of total failure to fulfil animal protection requirements in pigs was significant ($p = 0.0406$).

Discussion

When the conditions of well-being of cattle, sheep, goats and pigs in transport are observed, the animals are protected against most significant forms of cruelty, suffering, damage and against death in transport caused by improper handling. The present work is based on the conditions for animal protection as laid down in legal regulations of the Czech Republic. They are close to the conditions stipulated by EU regulations. The legal base for the conditions of animal protection is thus in agreement with the opinions published by Sojka (1992) and Troeger (1996). The legally based conditions contain appropriate scientific and professional knowledge and experience and correspond therefore with the information related to the conditions of transport of cattle published by Tarrant et al. (1992), Warriss et al. (1995), Tadić et al. (2000), Gallo et al. (2000, 2001), Villarroel et al. (2001), transport of calves published by Steinhardt (2001), Grigor et al. (2001), transport of sheep published by Knowles et al. (1995), Broom et al. (1996), Parrott et al. (1998, 1999), Hall et al. (1998a, 1998b), Jackson et al. (1999), Cockram et al. (1996, 1999, 2000), Kent (1997), transport of goats published by Nwe et al. (1996), and transport of pigs published by Warriss (1998), Lambooy and Engel (1991), Gade and Christensen (1998), Schutte et al. (1994). Stipulated conditions must, however, be checked by authorities. In accordance with the opinion of Texdorf (1993), veterinarians in this capacity were involved in the present work. It analyzes how of the conditions of animal protection have been observed and evaluated the numbers of the inspections carried out. Furthermore, the inspections were classified in three groups using the following scale: (1) animal protection requirements fulfilled, (2) animal protection requirements partially fulfilled and veterinary measures for the improvement of animal protection were imposed, (3) failure to fulfil animal protection requirements. The trends of the classification results were analysed within the period of 1996 to 2001. The results showed that even if the legal requirements for animal protection during transport are duly laid down, veterinary corrective measures may be necessary and sometimes even a total failure to fulfil the legal regulations on animal protection during transport occur. A surveillance of the fulfilment of the conditions mentioned above is therefore inevitable. The results of the present work indicate that in cattle, sheep, goats and pigs the conditions of animal protection in transport are violated in several cases per year. There is a significant trend in deterioration of the conditions in pigs. Since no complex study had been published on the numbers of veterinary measures imposed in order to improve the protection of cattle, sheep, goats and pigs, and on the numbers of total failures to observe the requirements on the protection of cattle, sheep, goats and pigs, it was impossible to compare directly the parameters mentioned above. The

inspections of the conditions for animal transport should be especially focused on loading and unloading of the animals, type and transport equipment, density of loaded animals, duration of transport, rest periods during the transport, way of driving, method of ventilation of the vehicle, feeding and watering of the animals, and on other conditions which are important for the protection of animals in transport, as mentioned by Meyen (2000), Troeger (1996), Fischer (1995), Schutte et al. (1994) and others.

In the literature available to us there was no comparable evaluation done using a similar size of data on supervisory activities aimed at the protection of animals during transport. An important finding emerged from this study, i.e. that the situation in animal protection in our country is not satisfactory as might be believed. It has not improved in the period under study and thus supervisory activities carried out by SVA officers are fully justified. Conditions of animal transport need improvement and the legislation must be further amended.

Přeprava skotu, ovcí, koz a prasat z pohledu ochrany zvířat proti týrání

Podle kontrol prováděných úředními veterinárními lékaři při dozoru dochází k porušování podmínek ochrany zvířat při přepravě. Autory proto byla ve vybraných souborech hodnocena přeprava skotu, ovcí, koz a prasat ve stanoveném období 1996 až 2001 v České republice. Každá kontrola byla posouzena podle stupnice: splnění požadavků k ochraně zvířat, stanovení veterinárních opatření k zlepšení úrovně ochrany zvířat, nesplnění požadavků k ochraně zvířat. Potřeba stanovení veterinárních opatření ke zlepšení úrovně ochrany skotu se pohybovala v rozmezí 0,00% až 1,35% z počtu provedených kontrol, u ovcí a koz se vyskytla jen ojediněle, u prasat se pohybovala v rozmezí 0,22% až 2,22% z počtu provedených kontrol. Nesplnění požadavků k ochraně u skotu se pohybovalo v rozmezí 0,00% až 0,83% z počtu provedených kontrol, u ovcí se vyskytlo jen v jednom případě, u koz žádném případě a u prasat se pohybovalo v rozmezí 0,00% až 3,31% z počtu provedených kontrol. Porovnali jsme výsledky pro období 1996 až 1998 s obdobím 1999 až 2001. Potřeba stanovení veterinárních opatření k zlepšení úrovně ochrany skotu se zvýšila z 0,53% na 0,82%, u prasat se zvýšila z 0,65% na 1,09%, nesplnění požadavků k ochraně skotu se zvýšilo z 0,00% na 0,37%, u prasat se zvýšilo z 0,33% na 1,33% a po statistickém zpracování χ^2 testem počítačovým programem Unistat se toto zvýšení bylo prokázáno statisticky významné ($P = 0,0406^*$). Z výsledků vyplývá, že u skotu, ovcí, a prasat dochází k porušování podmínek ochrany zvířat při přepravě na úrovni několika případů ročně a že existuje statisticky významný trend zhoršování těchto podmínek u prasat. Předložené hodnocení provedené soubornou analýzou za použití statistiky prokazuje, že není oprávněné tvrzení, že situace v ochraně zvířat při přepravě se v našich podmínkách za sledované období výrazně zlepšila. Prokazuje oprávněnost provádění dozoru a potvrzuje nutnost zlepšení podmínek ochrany zvířat a tím i nezbytné novely právních předpisů.

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