

Analysis of the major deficiencies detected during welfare inspections of farm animals in the Czech Republic

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Abstract

The level of compliance with livestock welfare requirements is directly reflected in animal health, behaviour, and performance as well as farm profitability. It is mandatory to keep animals in conditions that prevent suffering and that respect animal needs in terms of biology and ethology. Compliance with these obligations in the Czech Republic is supervised by the State Veterinary Administration (SVA) through inspectors affiliated to the veterinary administrations at the regional level. The aim of the study was to identify the main deficiencies observed during official site visits carried out at livestock holdings in 2016–2020 and to assess the trend of the most frequently occurring deficiencies during the reference period. Data obtained from Central Veterinary Administration of the SVA containing a total of 9,147 records of partial welfare checks were subjected to the analysis. The percentage of site visits where deficiencies were found at livestock holdings was 15.04%. When analysed in more detail, the results revealed a significantly ($P < 0.05$) highest frequency of violations with respect to administration and animal marking (2,054) followed by the provision of treatment and spatial conditions. The trend analysis showed no significant increase or decrease in the frequency of violations in the selected areas during the reference period ($P > 0.05$). The results show the need to focus on compliance with duties in the framework of administration and animal marking, provision of treatment, and provision of animal management standards, especially in terms of spatial conditions, nutrition, and animal hygiene where violations were consistently found most often.

Animal protection, veterinary inspection, livestock, farming

Livestock welfare is one aspect of sustainable livestock farming (Gunnarsson et al. 2020). Above all, healthy animals with good fitness without any signs of stress are able to satisfy their natural behaviours (Kumar et al. 2022). This requires disease prevention, appropriate veterinary care, shelter, management and nutrition, a stimulating and safe environment, and humane handling and slaughter (Farm Animal Welfare Council 2018). The absence of stress is the potential indicator of animal welfare (Popelková et al. 2022). According to Němečková et al. (2022), animal stress can also be caused by mere handling or other necessary tasks that are commonly used in animal management.

The European Union (EU) animal protection legislation is mostly based on minimum requirements for the conditions in which animals are kept, transported or killed (Veissier et al. 2021). Accordingly, farmers are obligated to meet public standards on animal health and welfare (More et al. 2021). Hus and McCulloch (2023) add that these animal welfare directives and regulations are transposed by EU Member States into their own legal systems. Hitchens et al. (2017) state that compliance with animal welfare legislation is verified by site visits carried out by authorised inspectors as employees of the official competent authorities (e.g. district boards in Sweden). As a term, ‘site visit’ refers to “comparing the actual state with the required state, examining potential irregularities,

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and monitoring compliance with current regulations” (Jagielski 2007; Lisiowska et al. 2018).

The system of animal protection in the Czech Republic is under the auspices of the Ministry of Agriculture and the State Veterinary Administration (SVA). The Ministry of Agriculture, through the Animal Protection Department, discusses, coordinates, and monitors the performance of animal protection tasks and submits proposals for necessary measures to the relevant state authorities. Accordingly, SVA supervises compliance with the obligations imposed on holders through the regional veterinary administrations (RVA) (Ministry of Agriculture 2022).

The aim of this study was to identify the main deficiencies that occurred in livestock holdings in the area of welfare based on the analysis of the results of official site visits carried out by the SVA in 2016–2020. Another aim was to assess the trend in the occurrence of the main deficiencies during the reference period.

Materials and Methods

For the purpose of the analysis, data were obtained from the Central Veterinary Administration of the SVA containing records of the results of non-administrative partial welfare checks carried out at livestock holdings in 2016–2020. Each time, the procedure was carried out at the livestock holding site in the presence of the holder and a RVA inspector. The site visit included specific control points (CPs) (68 in total) (Table 1) which are used to assess the environmental conditions, care, nutrition, housing quality, management methods, staff activities, as well as the obligations related to the animal registration and marking. The list of CPs is based on the requirements of European Directives (Council Directive 98/58/EC of 20 July 1998 concerning the protection of animals kept for farming purposes, Council Directive 2008/119/EC of 18 December 2008 laying down minimum standards for the protection of calves, Council Directive 2008/120/EC of 18 December 2008 laying down minimum standards for the protection of pigs, Council Directive 1999/74/EC of 19 July 1999 laying down minimum standards for the protection of laying hens, and Council Directive 2007/43/EC of 28 June 2007 laying down minimum rules for the protection of chickens kept for meat production), which were further implemented in particular in Act No. 246/1992 Coll. on the protection of animals against cruelty and its implementing Decree No. 208/2004 Coll. on the minimum standards for the protection of farm animals. Control points where a category of animals is directly specified are intended only for those listed and cannot be used for other categories or species of animals. Those CPs where this specification is not given are considered to be general and therefore intended for all species of livestock present during the site visit.

Table 1. List and classification of control points assessed in the context of livestock welfare checks.

Main group	Subset	Numerical designation	Control point name
Animal management standards	Nutrition and watering	1	Feedstuffs and other substances
		2	Feedstuffs, water and other substances
		3	Feedstuffs, water and other substances – fresh water
		4	Feedstuffs, water and other substances – sows and gilts – fibre
		5	Feedstuffs, water and other substances – calves – haemoglobin – iron
		6	Feedstuffs, water and other substances – calves – colostrum
		7	Feedstuffs, water and other substances – calves – constant access to feedstuffs
		8	Feedstuffs, water and other substances – calves – fibre
	Spatial conditions	9	Buildings and housing – Facilities and housing
		10	Buildings and housing – Facilities and housing – enclosure
		11	Spatial conditions
		12	Spatial conditions – laying hens – commercial holding over 350 individuals – stocking density
		13	Spatial conditions – fattening cattle – horned vs. hornless stock
		14	Freedom of movement
		15	Freedom of movement – sows and gilts – tied stalls
		16	Freedom of movement – calves – muzzle
		17	Freedom of movement – calves – tethering

Table 1 (continued).

Main group	Subset	Numerical designation	Control point name		
Equipment requirements		18	Automatic/mechanical devices		
		19	Automatic/mechanical devices – spare power supply		
		20	Buildings and housing – indoor equipment		
		21	Buildings and housing – indoor equipment – broilers, over 500 birds – feeders		
		22	Buildings and housing – indoor equipment – broilers, over 500 birds – watering equipment		
		23	Buildings and housing – indoor equipment – cows and heifers – obstetric equipment		
		24	Buildings and housing – indoor equipment – cows and heifers, dairy production – milking		
		25	Buildings and housing – indoor equipment – laying hens – commercial holding over 350 birds – nests		
		26	Buildings and housing – indoor equipment – laying hens – commercial holding over 350 birds – roosts		
		27	Buildings and housing – indoor equipment – laying hens – commercial holding over 350 birds – feeders		
		28	Buildings and housing – indoor equipment – laying hens – commercial holding over 350 birds – watering equipment		
		29	Buildings and housing – indoor equipment – laying hens – commercial holding over 350 birds – floors		
		30	Buildings and housing – indoor equipment – laying hens – commercial holding over 350 birds – litter area		
		31	Buildings and housing – indoor equipment – laying hens – commercial holding over 350 birds – claw processing aids		
		32	Buildings and housing – indoor equipment – laying hens – commercial holding over 350 birds – aisles		
		33	Buildings and housing – floor		
		34	Floors – grates		
		35	Handleable material		
		Animal hygiene conditions		36	Buildings and housing – animal hygiene
				37	Buildings and housing – animal hygiene – broilers over 500 birds – noise
				38	Buildings and housing – animal hygiene – broilers over 500 birds – ammonia concentration
				39	Buildings and housing – animal hygiene – broilers over 500 birds – CO2 concentration
				40	Buildings and housing – animal hygiene – broilers over 500 birds – relative humidity
				41	Buildings and housing – animal hygiene – broilers over 500 birds – ambient temperature
				42	Buildings and housing – zoo hygiene – broilers over 500 birds – heating
				43	Buildings and housing – zoo hygiene – broilers over 500 birds – ventilation
				44	Buildings and housing – zoo hygiene – noise
				45	Lighting
				46	Lighting – broilers over 500 birds – day lighting mode
				47	Lighting – broilers over 500 birds – lighting intensity
				48	Buildings and housing – disinfection
				49	Buildings and housing – waste and waste removal
		Prohibited management methods		50	Other types of conduct leading to suffering
				51	Promotion of cruelty
		Holder's duties	Administration and animal marking	52	Notification of activities
53	Approval and registration				
54	Record keeping				
55	Animal records				
56	Animal marking				
Checks		57	Checks – daily checks, clinical condition of animals, isolation		
Provision of medical treatment		58	Staff		
		59	Animal management methods – animal care		
		60	Animal management methods – animal care – piglets – weaning		
		61	Animal management methods – selection breeding		
		62	Animal management methods – prevention and vaccination		
63	Animal management methods – animal transfers				
Non-permitted actions		64	Non-permitted actions		
		65	Non-permitted actions – piglets – castration		
		66	Non-permitted actions – piglets – tail docking		
		67	Non-permitted actions – piglets – teeth adjustment		
		68	Non-permitted actions – piglets – ear notching		

According to the SVA (2021), planned site visits are the basis of surveillance activities. The number and type of these site visits are based on the methodology of the multi-annual site visit schedule, which, on the basis of an analysis, determines the minimum annual frequency of planned site visits or the minimum percentage of the total number of operators to be inspected. Unscheduled site visits are carried out for several reasons, e.g. changes in the operators during the year, reported suggestions or findings of the RVA in other areas of supervisory activity and follow-up checks of the implementation of instructions imposed to correct identified deficiencies ('corrective measures'). The selection of livestock holdings for planned site visits is based on risk criteria consisting of: the number of animals per livestock holding (farms with less than 50 or more than 500 animals are considered to be higher risk); applicants for subsidies; organic livestock holdings and holdings where no animal welfare or cross-compliance checks have been carried out in the previous three years.

A total of 9,147 site visit records were analysed, containing data on the year, type of animals, list and number of CP violations and the results of the site visits themselves, i.e. whether or not any deficiencies were found. For the purpose of this study, the data were processed in Microsoft Excel 2019.

A list of all the partial welfare checks carried out, the number of site visits with detected deficiencies (also as a percentage) and the total number of CP violations in each year 2016–2020 was produced. Furthermore, the numbers of site visits with detected deficiencies were expressed according to the CPs violated (in %) within the range of these values determined by us (0.1%–5%; 5.1%–10%; 10.1%–15%; 15.1%–20%; 20.1%–30%; 30.1%–40%; 40.1%–50%; above 50%). Subsequently, the frequencies of violations were expressed for each CP and also by livestock species (cattle, sheep, goats, horses, pigs, poultry, ratites, farmed game, fish and unknown = not specified) for the whole reference period. For the purpose of analysing the detected violations, the CPs were divided into groups according to their focus (two main groups and nine subsets) (Table 1), within which the number of deficiencies for the whole reference period was expressed. Trends were then compiled for the main groups and for the five most notable subsets of CPs where the highest number of violations were detected, for the years 2016–2020. The number of deficiencies by livestock type was also expressed for these five most notable CP subsets.

Chi-square test in Microsoft Excel 2019 and Spearman's correlation coefficient in RStudio were used for statistical data analysis. Chi-square test was used in this study to compare frequencies for site visits with deficiencies between 2016 and 2020, site visits with deficiencies by number of CPs violated, number of CPs violated between 2016 and 2020, and animal species, individual CPs, subsets, and main groups, at a significance level of $P < 0.05$. Using Spearman's correlation coefficient at a significance level of $P < 0.05$, the trend in the frequency of CP violations was evaluated for all subsets to determine whether there was an increase or decrease in the incidence during the follow-up period.

Results

During the 2016–2020 reference period, the site visits that found deficiencies in livestock holdings accounted for a total of 15.04% (Table 2). In each year, this proportion ranged between 11.75% (in 2017) and 18.93% (in 2019), but was not significantly different ($P > 0.05$).

In the case of site visit deficiencies, the most frequent number of CP violations found was in the range of 0.1%–5% (602 site visits), followed by 5.1%–10% (371 site visits). Violations of more than 10% of the CP were found in less than 200 site visits (Fig. 1).

The highest number of CP violations during the reference period was found in 2019 (1,298 CP violations) (Fig. 2). In the other years of the reference period, significantly ($P < 0.05$) lower numbers of violated CPs were found.

Table 2. Number of welfare checks carried out and number of site visits with detected deficiencies in 2016–2020.

Reference period (year)	Qty. of site visits	Number of site visits with a deficiency	Number of site visits with a deficiency (%)
2016	1938	231	11.92 ^a
2017	2000	235	11.75 ^a
2018	1873	281	15.00 ^a
2019	1770	335	18.93 ^a
2020	1566	294	18.77 ^a
Total	9147	1376	15.04

^a Values in the column with the same superscript letter are non-significantly different ($P > 0.05$)

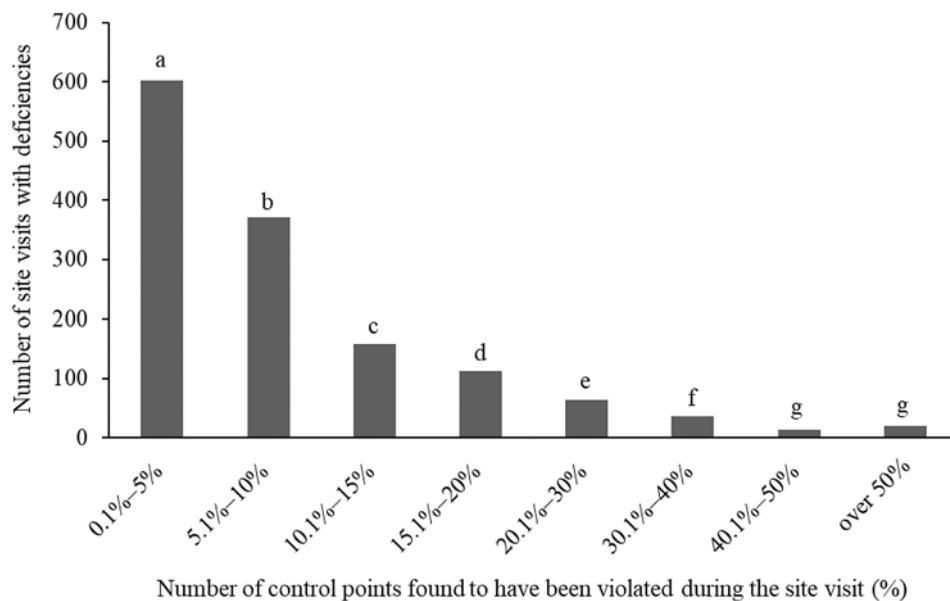


Fig. 1. Number of welfare checks with a deficiency by number of control points found to have been violated (%) in 2016–2020.

a-g Values with different letters are significantly different ($P < 0.05$)

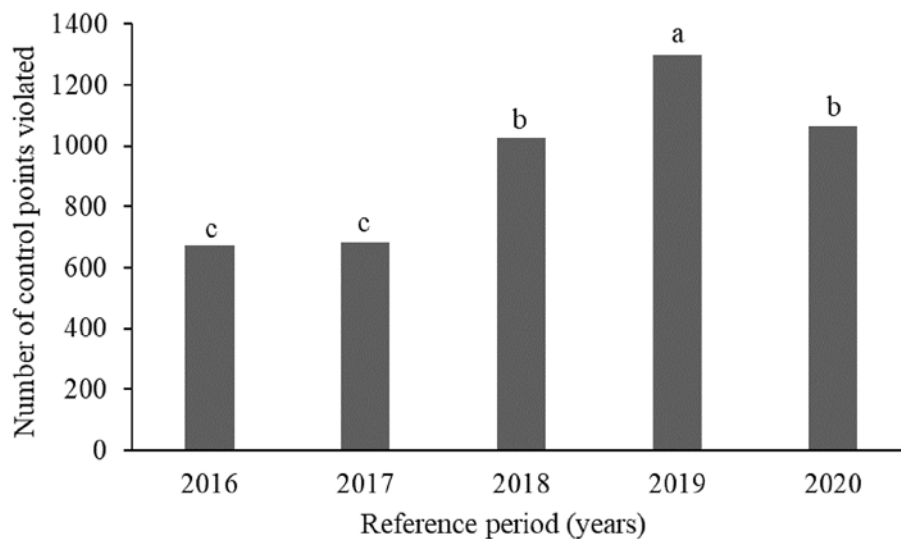


Fig. 2. Number of control points violated between 2016 and 2020.

a-c Values with different letters are significantly different ($P < 0.05$)

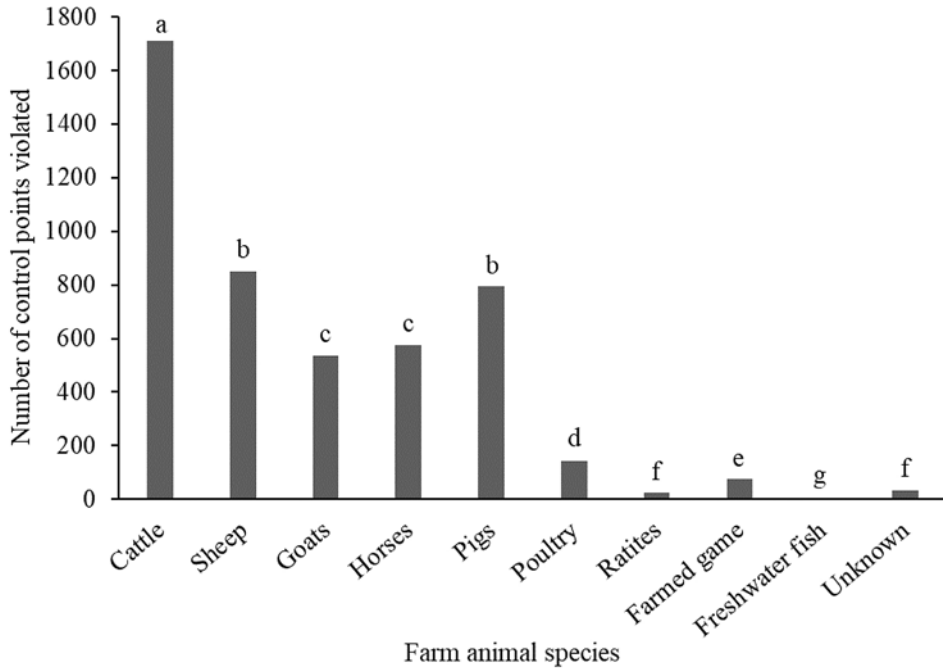


Fig. 3. Number of violated control points by livestock species in 2016–2020.

a-f Values with different letters are significantly different ($P < 0.05$)

In terms of livestock species inspected (Fig. 3), the highest number of violations of the CPs was found in cattle (1,708). A significantly lower number of violated CPs was found in sheep (849) and pigs (796), between which there was no significant difference ($P > 0.05$).

The number of violations of each CP is shown in Fig. 4. The highest number of violations was found in seven CPs, namely Animal registration (768), Animal marking (678), Management method – animal care (535), Record keeping (431), Feedstuffs, water and other substances (383), Buildings and housing – facilities and housing standards (347) and Buildings and housing – animal hygiene (249). For the other CPs, the number of violations during the reference period was less than 150.

When comparing the frequencies of CP violations among the main groups of CPs, 2,934 violations of CPs in Holder's duties and 1,805 violations of CPs in Animal management standards were found in the reference period. There was a significant difference between the groups ($P < 0.05$).

When analysing the CP subsets (Fig. 5), the highest number of violations ($P < 0.05$) was found for the CP subset of Administration and animal marking (2,054). For the other subsets, fewer than 800 CP violations were found.

Table 3 shows the number of violations for the five most frequent CP subsets by livestock species in the reference period. For all species except fish, the most frequent violation of the CP was seen in Administration and animal marking; CP violation in the other subsets was significantly ($P < 0.05$) lower.

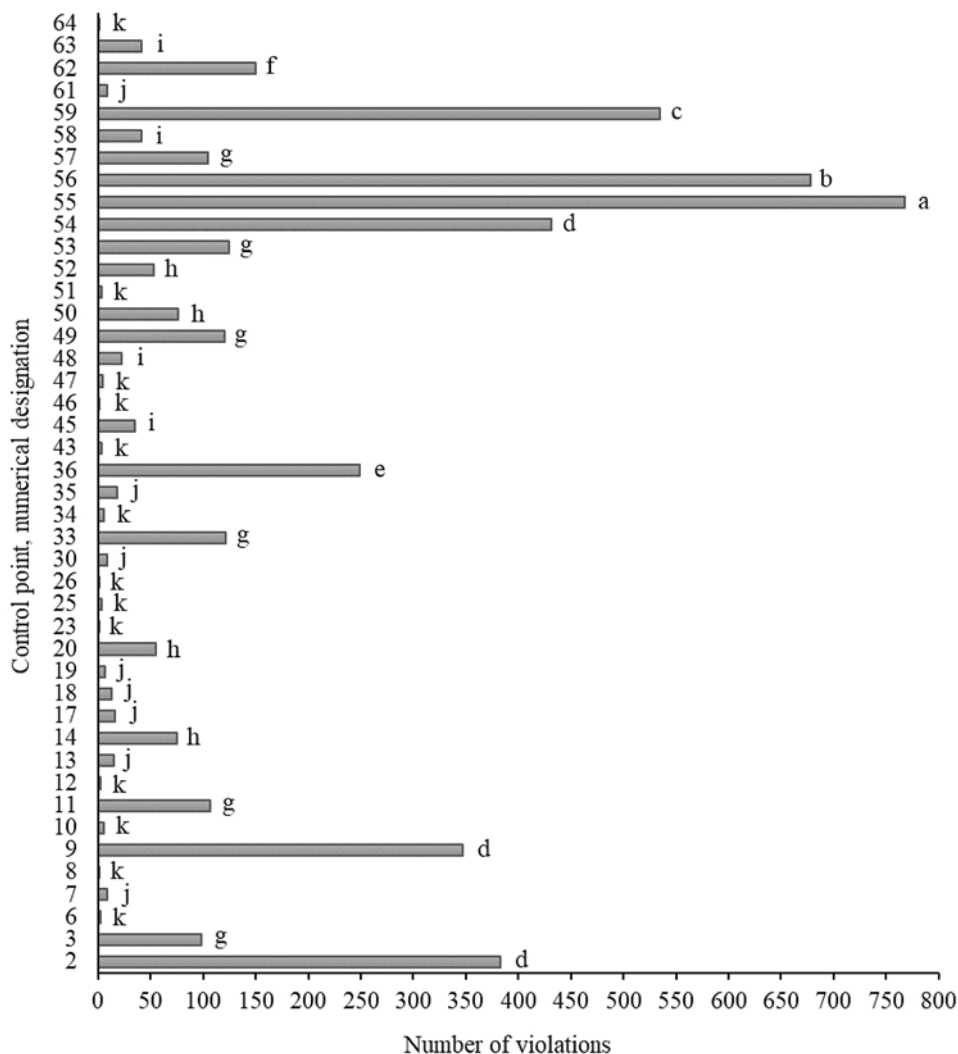


Fig. 4. Number of violations of individual control points in 2016–2020 (numerical designation of control points as per Table 1).

a-k Values with different letters are significantly different ($P < 0.05$)

An indication of the increasing trend in the number of violations for the main CP groups over the reference period is shown in Fig. 6. However, the increase was not significant in any of the groups (Animal management standards $rSp = 0.700$; $P = 0.233$; Holder's duties $rSp = 0.9$; $P = 0.083$). The results of the trend analysis on the number of CP subset violations are presented in Table 4. None of the CP subsets showed an increasing or decreasing trend, and the number of violations did not change during the follow-up period ($P > 0.05$).

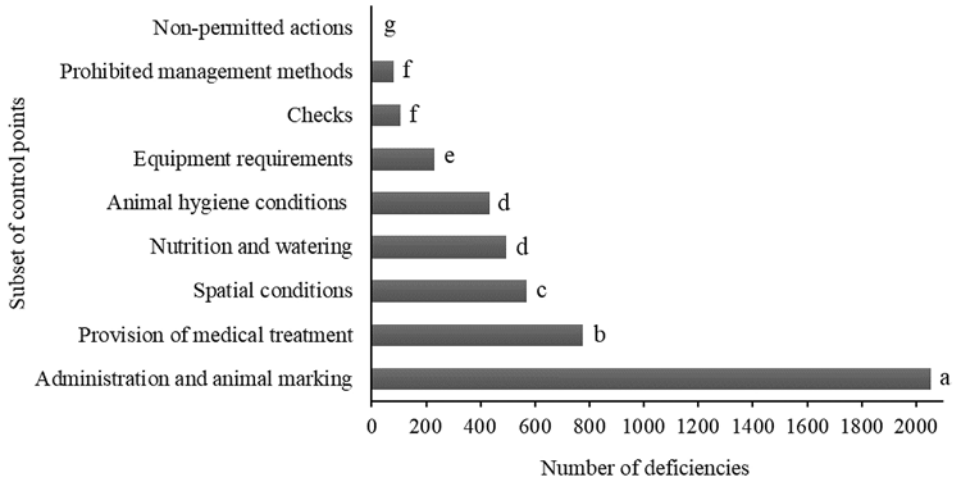


Fig. 5. Number of violations by control point subsets in 2016–2020. a-g Values with different letters are significantly different ($P < 0.05$)

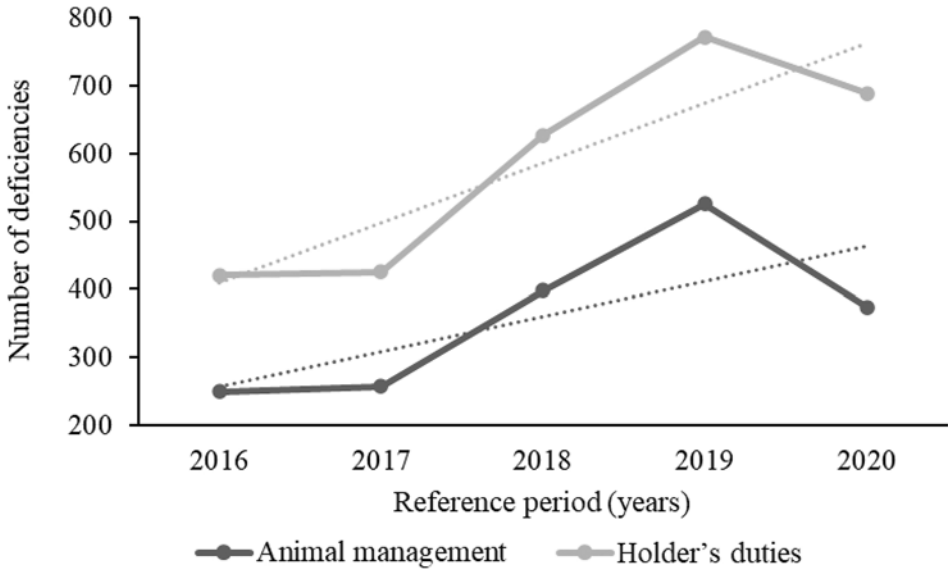


Fig. 6. Trends in the frequency of violations of the main groups of control points over 2016–2020.

Table 3. Number of violations for the five most significant subsets of control points by livestock species in 2016–2020.

Farm animal species	Subset of control points				
	Administration and animal marking	Provision of medical treatment	Spatial conditions	Nutrition and watering	Animal hygiene conditions
Cattle	484 ^{a,t}	360 ^{b,t}	256 ^{c,t}	216 ^{c,t}	211 ^{c,t}
Sheep	525 ^{a,t}	119 ^{b,u}	61 ^{c,v}	38 ^{d,v}	58 ^{c,u}
Goats	382 ^{a,u}	46 ^{b,w}	42 ^{b,w}	24 ^{c,w}	22 ^{c,v}
Horses	205 ^{a,w}	137 ^{b,u}	103 ^{c,u}	46 ^{d,v}	37 ^{d,v}
Pigs	322 ^{a,v}	77 ^{c,v}	74 ^{c,v}	156 ^{b,u}	78 ^{c,u}
Poultry	43 ^{a,x}	19 ^{b,x}	18 ^{b,x}	7 ^{c,x}	25 ^{b,v}
Ratites	19 ^{a,y}	2 ^{b,z}	2 ^{b,y}	0 ^{b,y}	1 ^{b,w}
Farmed game	48 ^{a,x}	7 ^{b,y}	11 ^{b,x}	6 ^{b,x}	2 ^{b,w}
Fish	0 ^{b,z}	1 ^{a,z}	0 ^{b,y}	0 ^{b,y}	0 ^{b,w}
Unknown	26 ^{a,y}	7 ^{b,y}	0 ^{c,y}	0 ^{c,y}	0 ^{c,w}

^{a-d} Values with different superscript letters in rows within the same species are significantly different ($P < 0.05$)

^{t-z} Values with different superscript letters in columns within the same control point subset are significantly different ($P < 0.05$)

Table 4. Evaluation of the trend in violation frequencies for each subset of control points between 2016 and 2020 using Spearman's correlation coefficient (rSp).

Subset of control points	rSp	<i>P</i>
Nutrition and watering	0.6000	0.3500
Spatial conditions	0.7000	0.2333
Equipment requirements	0.7000	0.2333
Animal hygiene conditions	0.8000	0.1333
Prohibited management methods	0.6669	0.2189
Administration and animal marking	0.9000	0.0833
Checks	0.2052	0.7406
Provision of medical treatment	0.6000	0.3500
Non-permitted actions	0.7071	0.1817

Discussion

The most frequent violations identified through the evaluation of the CP subsets during the 2016–2020 reference period were in the area of Administration and animal marking. According to our results, holders commit most deficiencies in the obligation to register animals (registration of animals and reporting changes to the central registry), marking of animals, and record keeping. The same conclusions were reached by Escobar and Buller (2014), who reported that in welfare assessments in England, holders are more likely to be fined for poor record keeping than for poor animal care. The consequence is a misunderstanding of the official results of welfare checks which show a high frequency of violations, but not primarily found in the provision of care for livestock. According to Escobar and Demeritt (2017), holders generally view record keeping and animal care as two distinct and largely unrelated practices. Holders maintain that direct contact with the animals is essential for creating good living conditions and consider administrative matters less important.

The second largest subset of the violated CPs was the provision of treatment. Here, most deficiencies were found in animal care. These results are confirmed by Hedman et al. (2018) based on their study in Sweden. The authors report that the most common deficiencies found during official site visits on dairy farms were dirty animals. According to Sant'anna and Paranhos da Costa (2011), contaminated animals are the number one problem in dairy cow welfare due to the increased risk of mastitis and also potentially poorer milk quality. Cleanliness can be an indirect measure of cattle welfare as reported by Cozzi et al. (2009). Due to the low level of hygiene, infectious diseases of the digestive tract are common. In this study, we also found a high frequency of violations within the animal hygiene conditions, thus concluding the five most notable subsets in terms of the number of CPs violated. In addition, there is lameness that can have several causes, such as poor hygiene, inadequate hoof care, inadequate housing facilities including floors, and unbalanced feedstuffs (Nalon and Stevenson 2019; Masebo et al. 2023). If left untreated, lameness can compromise the health and welfare of animals and can even lead to premature culling or death. In order to comply with EU legislation on the protection of farm animals, holders must take all steps to ensure the welfare of the animals and avoid unnecessary pain, suffering or injury. This includes prevention and early treatment of animals showing signs of lameness (Nalon and Stevenson 2019).

Moreover, according to Hedman et al. (2018), contaminated animals are directly related to inappropriate housing systems. This is also in line with our results, where spatial conditions were the third most frequently violated subset of the CPs, within which problems were found mainly in the area of animal housing as such. Lack of space is a serious problem on livestock farms. Cozzi et al. (2009) reported that the lack of space in pens is the cause of aggressive behaviour among animals, reduced time of resting, and, subsequently, rumination. According to Ingvarstsen and Andersen (1993), such behaviour in animals has a direct impact on low feed intake, poor feed conversion and thus, insufficient daily gain. According to Masebo et al. (2023), spatial conditions are also related to the development of skin lesions, which often occur in the neck and back area due to overstocking, lack of space around feed racks or poor pen flooring (Cozzi et al. 2009).

According to Buddle et al. (2021), animal management standards are directly linked to animal performance, which directly affects reproduction and daily gains. Meat cattle and meat sheep holders in Australia are fully aware of this, and therefore take the utmost responsibility for the animals' requirements in terms of holding conditions. Based on their study in Finland, Kauppinen et al. (2012) reported that on high productivity pig farms, holders consider improving welfare levels to be important and easier to implement than holders on lower productivity farms. The reason for this is mainly the economic impact, where in the case of large-scale farms, non-prosperous animals are a major problem for the profitability of the holding.

The fourth subset of the most frequently violated CPs was nutrition and watering. According to Kauppinen et al. (2012), pig holders consider digestive problems, specifically diarrhoea, to be the most critical welfare issue as it is directly related to production losses and increased production costs. Clark et al. (2006) further stress that, for example, in broiler holdings, nutritional management is very important as due to selection for rapid growth, which is purposefully achieved in meat poultry, there must be no long-term starvation.

Based on the comparison of the frequency of violations for individual livestock species, although the highest numbers of violations of CPs were found for cattle, this result is strongly influenced by the high numbers of registered animals during the reference period of 2016–2020, as documented by the Czech Statistical Office (2023). Cattle presents the most common individually registered livestock species in the Czech Republic. Furthermore, high numbers of deficiencies were found in sheep, where, as Marcone et al. (2022) report

based on the results of their study in Italy, the most common problem and therefore the most relevant indicator of sheep welfare tends to be the incidence of mastitis, lameness, and poor fitness. It is these problems that have a major impact on animal production and health.

Pigs were the third livestock species where high numbers of violations were found. In their research in Brazil, Albernaz-Gonçalves et al. (2021) identified many indicators of poor pig welfare (e.g., the use of painful and stressful practices or keeping the animals in a setting that limits the expression of natural behaviour). However, most of the holders they interviewed were satisfied with the welfare standards of pigs on their farms. Thus, they saw no reason for further investment in its improvement. Sørensen and Fraser (2010) state that the results of site visits are often influenced by the different animal welfare perspectives of the holder and the inspector. The inspector assesses animal welfare from a legislative point of view, but the understanding of animal welfare as a term often differs from the side of the holders. This way the difference is in what is considered more important or 'true'. For example, conventional pig holders define animal welfare primarily on the basis of physical health and production levels (Bock et al. 2007), whereas organic pig holders also focus on the physical and mental aspects of animal welfare (Te Velde et al. 2002).

The trend assessment found no increase in deficiencies during the reference period. The SVA (2020) provides an evidence of the fact that welfare checks have become an increasingly important area of surveillance in recent years. The protection of animals against cruelty has become an important issue and therefore more and more demands and requirements are being placed on livestock farming standards. Furthermore, the growing public interest in animal welfare in livestock production in recent decades has also contributed to this, leading to higher legal requirements in many European countries and the EU (Immink et al. 2013; Vanhonacker and Verbeke 2014; Gocsik et al. 2015). For this reason, the pressure to improve welfare levels on livestock farms is increasing.

In conclusion, ensuring proper holding standards and continuously improving the welfare level of livestock is an important part throughout the management of the stock. With regard to the results of the present study, it is necessary to focus in particular on proper compliance with the duties as part of animal registration and marking based on the applicable legislation, as well as ensuring proper animal care and providing holding standards that meet the needs of animals for space, nutrition, and hygiene. On the positive side, there is no increase in the number of found violations despite the targeted focus of the site visits. The ideal status, however, is to achieve a situation where the number of violations observed decreases overall.

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