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Evaluation of Heifer Welfare in Two Different Rearing Systems

Ernest PLEMENITAŠ, Dejan ŠKORJANC, Janko SKOK, Maja PREVOLNIK POVŠE*

University of Maribor, Faculty of Agriculture and Life Sciences, Pivola 10, 2311 Slovenia

ABSTRACT

The welfare of domestic animals, which is a core part of livestock farming today, depends strongly on the rearing system. While free-stall systems are encouraged, tied rearing systems are still the most widely used in cattle farming, although considered less suitable due to restricted freedom of movement. As an alternative to this system, free-stall rearing, which allows movement, is proposed as a minimum standard. Although it seems self-evident that free-stall rearing is better than tied rearing system, there is still a lack of research on whether this is true for all categories of cattle or whether it might be appropriate for some of them (e.g. depending on age). The aim of the present study was therefore to compare the welfare of heifers in tied and free-stall rearing during the fattening period (at different ages). In general, we have suggested higher welfare scores in free-stall system, with the tied stall being more problematic for younger animals. The study comprised five heifers in each system per repetition (20 animals in total). Data were collected using the Welfare Quality® protocol, which involves the assessment of four main principles: feeding, housing, health and behaviour. The assessments were carried out approximately every three months during the fattening period (from 6 to 27 months of age). The results showed significant differences in animal welfare scores between tied and free-stall systems only in terms of housing and the tendency of differences in behaviour. For both principles, the scores were relatively low compared to feeding and health, where no differences were found between the rearing systems. In terms of temporal dynamics, differences were only found for housing, with values decreasing with age in both rearing systems. In the free-stall system, the scores were almost optimal in young animals (>90), but decreased rapidly with increasing age, while in the tied housing system, a suboptimal welfare scores were already observed in young animals ($\approx$40). This means that tied rearing system is a clear disadvantage for the welfare of younger animals, which are generally more exploratory and active. Our results confirmed tied stall as less suitable in terms of animal welfare, especially for young animals. It is therefore encouraged that young animals should primarily be housed in a free-stall pens if both systems are available in the breeding facilities.

Keywords: animal welfare, cattle, heifer, rearing system, assessment protocol

INTRODUCTION

Animal welfare has become increasingly important in recent years as one of the elements of the overall concept of "food quality". Consumers expect food to be produced in compliance with animal welfare guidelines; as a result, animal welfare assessment protocols have been developed (e.g. Welfare Quality®, 2009). One of the fundamental aspects of animal welfare is whether animals have the opportunity to move freely. In this context, tied rearing system is considered problematic, unsuitable method of husbandry, as it restricts the animals' movement and makes it impossible for them to express their natural behaviours.

In 2020, the proportion of cattle in tied rearing in Slovenia was 73 %, i.e. in around 21,000 farms with almost 350,000 cattle and in around 4,300 farms (15 %) the free stall system (slurry-system) was used for fattening cattle (SURS, 2024). A definitive ban on tethering cattle is currently being discussed in the European Union. So far, only Norway and Denmark have decided to restrict this system. In Denmark, the ban will come into force on 01.07.2027, while Norway will introduce a ban on 01.01.2034 (Vešnik, 2023). In 2024, Austria also decided and agreed to ban this system after 2030. The date for the ban on tethering is repeatedly postponed, as tied rearing continues to dominate. A ban on tethering would displace many family farms. In 2007, for example, the EU decided to ban tied rearing on organic farms, which only came into force in 2014, but provided for an exception for small farmers. Therefore, agreements between breeders and politicians are being sought with new standards for this system, e.g. 245 days tethering and 120 days free movement (Expertise for Animals, 2024). Slovenia has not yet decided to

restrict tied rearing, and so tied rearing will continue after 2027.

In tied rearing system, problems arise mainly due to the limited space, such as standing up and lying down. Space is limited by short stands and high mangers (Hoffmann and Rist, 1975). From this it can be deduced that the animals could be injured by inadequate housing. Urinating and defecating in the same place leads, among other things, to a higher proportion of dirt on the body parts (which is one of the measures of animal welfare quality), especially if the recommendations for daily cleaning of the barn are not followed (Whay et al., 2003). In addition, there are many other problems associated with tied rearing, such as an insufficient number of drinkers in the barn, which can result in subordinate cattle drinking less frequently than dominant cattle (Little et al., 1980). Leg problems and pressure sores are more common in older animals (due to high weight and lack of exercise) in a tied rearing system, while in a free-stall system, injuries can occur due to slippery floors and interactions between animals (more common in younger animals). Nevertheless, tied rearing is still widely used in animal husbandry, especially in cattle breeding. This system is attractive due to the low investment costs. It offers excellent individual care for the animals. Since the animals are at rest, it is also suitable for carrying out treatments, veterinary work and breeding (Morabito and Bewley, 2020). However, free-stall housing is generally considered as the better alternative for improving animal welfare, as it offers the animals more comfort as they can move around freely. Indeed, free-stall housing also has certain shortcomings. One of these is the higher risk of injury (Whay et al., 2003), which can result from negative social interactions (aggression, etc.) that animals may engage in when kept in free-stall pens and which can be harmful when space for movement is limited. In this respect, access to pasture can have a positive effect on cattle health and behaviour (Von Wachenfeldt, 1997). It is difficult to always plan for the right number of animals in the stables, so the problem often arises that not every animal has its own bedding area, which leads to major health problems. Such constructions are more expensive and require more space, which often discourages farmers from converting their stables.

In general, free-stall system provides higher animal welfare standards than tied rearing. However, there are many factors that can influence the welfare of the animals. As animal behaviour changes with age, the influence of a particular rearing system, and therefore the welfare status, may depend on the age of the animals. It may even turn out that at a certain stage of development (age) and under the influence of the environment, tied rearing is either comparable or even better in terms of animal welfare.

Considering the welfare of cattle, numerous articles have been published in recent decades dealing with the welfare of dairy cows (Knierim and Winckler, 2009; de Vries et al., 2013; Andreasen et al., 2013, 2014; Otten et al., 2020; Beaver et al., 2021; van Eerdenburg et al., 2021). In fattening cattle, the focus in the past has mainly been on the welfare of bulls (Gotardo et al., 2009; Kirchner et al. 2014a, 2014b; Schneider et al., 2020; Tarantola et al., 2020), while there is a lack of literature on the welfare of heifers. In addition, there are also no comparative studies on two different rearing systems (tied and free-stall) for heifers. Therefore, the aim of the present study was to evaluate the welfare status (using the Welfare Quality® protocol) of heifers in different rearing systems during entire rearing process in order to assess the temporal dynamics of animal welfare in the chosen systems.

We hypothesised that (i) animal welfare is generally higher in free-stall system than in tied rearing system, (ii) animal welfare varies according to the age of the animals, (iii) tied rearing system is more problematic in terms of animal welfare for younger animals that require more movement.

Materials and Methods

Study site and animals

The study took place on a local commercial farm near Rogaška Slatina (Slovenia). The farm is classified as a small farm with agricultural land in areas with limited possibilities for agricultural production (less-favoured areas). The farm has two types of rearing – tied and free-stall rearing. In each type, five heifers of different ages are reared at the same time, with the age of the animals being the same within a rearing system but varying between systems. The heifers are crosses of different breeds (Charolais, Limousin, Simmental). Tied rearing system means that the animal is tied permanently, thus combining rest, feeding and manure removal (three times a day). The barn is 6.5 m long and 4.50 m wide and the stalls are 1.95 m long and 0.8 m wide. The urine collection channel is 5.0 m × 0.3 m in size. There is a concrete crib in front where the animals are fed (6.0 m × 0.5 m × 0.3 m). The floor is made of concrete and straw is used for bedding. Drinkers are cup-type (one drinker for two heifers). The feed consists of hay, senage (most of it), fresh grass, maize silage, maize meal, barley and forage. In both systems, hay is fed in the morning, followed by haylage, and fresh grass in the evening (or maize silage, depending on the season). In contrast to confinement, free-stall rearing means that the animals are free to move around within a group pen. The farmer's job is only to feed the animals and check on them regularly. The barn is 4.80 m long and 3.90 m wide. The group pen is 3.90 m × 3.50 m in size. The floor is made of concrete slats. Two cup drinkers are used for watering. The feeding is carried out in a concrete crib (3.50 m × 0.55 m × 0.30 m). Small iron posts (10 in total) serve as a

barrier for feeding. Both rearing systems have sufficient openings for light and air flow.

We monitored actual situation on the farm from the beginning of fattening to slaughter without any additional interventions in the daily breeding work and tasks. The approval of the ethics committee was therefore not required according to Directive 2010/63/EU (2010). On the farm, new animals/calves are usually brought in at an average age of around 7.5 months (280 kg live weight). The calves are purchased from Hungarian pastures and were therefore not bred in any of the systems practised on the farm. The heifers (whole groups at a time) are sold at the age of 24 to 27 months, depending on the market situation. During the study period, the animals were bought at 7.9 months of age thus sold at 27 months of age. Two repetitions were carried out thus a total of 20 animals were included in the study.

Welfare evaluation

The data collection took place over a period of 13 months. A total of seven assessments were carried out at intervals of around 3 months. All seasons were included. The welfare assessments began one week after the calves were purchased and ended one week before the heifers were sold.

The welfare status of the heifers was assessed using the Welfare quality protocol® (2009), which includes four main observation areas or principles (feeding, housing, health and behaviour). Each principle comprises two to four criteria (twelve in total), that are assessed by on-farm measures. To determine the suitability of each criterion and principle, a score between 0 and 100 is calculated, indicating the worst or best possible situation. The focus of the protocol is on the assessment of the individual animal. Most of the measurements and observations prescribed by the protocol are animal-based, although there are also some management-, farm- and pen-based measurements. The specificity of the protocol is also that good results/scores for one measure/criterion cannot compensate for poor results/scores for another measure/criterion (Welfare Quality®, 2009).

During the study, most of the data were obtained through direct observations and measurements of the animals in the barn. Only a small part of the information (availability of an outdoor run or pasture, dehorning and castration, mortality) was obtained from the breeder before the evaluation. Some data was also obtained from video recordings. The use of video recordings contributed to better monitoring of the animals. The recordings started at 8:20 am and lasted 120 minutes. The recordings were made simultaneously in both breeding systems using two telephones. Before recording began, the animals were fed dry feed (eliminating the influence of diet). A brief summary of the animal welfare assessments and the subsequent calculations of the welfare scores is given below, while a detailed description can be found in the Welfare Quality® protocol (2009).

Welfare measurements and observations

The first principle (feeding) consists of two criteria, i.e. the absence of a prolonged hunger, which is determined by measuring body condition (satisfactory, very lean), and the absence of prolonged thirst, which is assessed by the type of drinkers (e.g. cups), the cleanliness of the water points (clean, partially dirty, dirty) and the number of animals using the water points. The second principle (housing) is also divided into two criteria. Comfort at resting is made up of the time the animal needs to lie down and the cleanliness of the animal (the proportion of the body surface covered by pads or liquid dirt). The time is measured from the time the animal bends over and lowers the wrist to the time the animal pulls the front leg out from under the body (the average time for the animals assessed is reported). The second criterion, ease of movement, includes two measures: the dimensions of the cubicles in relation to the weight of the animal and access to outdoor areas/pastures. To assess the characteristics of the pen in relation to live weight, the dimensions of the pen, the number of animals in the pen and the weight of the animals are recorded. With regard to access to outdoor areas or pastures, it is indicated whether and to what extent (number of hours or days of access) access is available on the farm. The third principle relates to health and is divided into three criteria. The absence of injuries criterion records the frequency of lameness (percentage of lame animals) and skin lesions (percentage of animals with mild and severe lesions). The absence of disease criterion is assessed on the basis of mortality (deaths, euthanasia, emergency slaughter) and the occurrence of various symptoms (coughing, nasal and eye discharge, diarrhoea, obstructed breathing, bloated rumen). The third criterion for the health status is the absence of pain. Here we evaluate whether and how dehorning and castration are carried out on the farm. The fourth principle relates to behaviour, which consists of four criteria. Various aggressive and cohesive interactions are recorded to assess social behaviour. For negative interactions, pushing, shoving, chasing, fighting and chasing are recorded and expressed as the average number of aggressive behaviours per animal per hour. The same applies to cohesive behaviour, which includes social licking and horning. Under the criterion of other behaviours, access to pasture is assessed (number of days per year, number of hours per day). In order to measure good human-animal relationships, an avoidance test is carried out at the feeding site. At a distance of 3.5 metres from the animal, the assessor makes sure that the animal is attentive and then slowly approaches the animal, holding his arm at an angle of about 45 degrees. We record the percentage of animals that allow to be touched as well as the

2023). However, the principle scores for housing were generally quite low for both tied and free-stall system, as the animals did not have the opportunity to graze in any of the rearing systems. Criterion scores for resting comfort, assessed by lying time and animal cleanliness, did not differ between rearing systems, with the percentage of heifers rated as dirty (20-30 %) and lying time of heifers (≈5 s) showing no differences between rearing systems.

The principle scores for health were high and did not differ significantly between the rearing systems (99.8 and 89.8 for tied and free-stall system, respectively). The median scores for absence of disease and absence of pain due to rearing interventions were 100 for both rearing systems. No diseases were detected in the barn during the study and no breeding interventions (castration, tail docking, etc.) were carried out. In both systems, integumentary changes occurred, but only in a mild form (e.g. hairless patches due to the stall equipment). Only one lame heifer was observed in the final fattening phase. The lameness can have various causes. In our case, we assume that it is due to the lack of space, which causes the animals to turn around more frequently (leading to hoof abrasion). Lameness is often caused by uneven and unsuitable ground. Fewer infectious and non-infectious foot diseases (white line disease, digitalin dermatitis, *E. coli*) were found in tie system than in free-stall system (Beaver et al., 2021).

In our study, the principle score for behaviour were generally quite low, but tended to be higher in tied system than in free-stall system (39.6 and 30.8, respectively). The reason for low scores was the fact that animals had no access to pasture (score 0.0). There were no significant differences between the rearing systems for the criterion human-animal relationship and emotional state. In both systems, the heifers showed a good human-animal relationship, as most of them allowed themselves to be touched by humans and showed no fear reactions (score 100 in both systems). Although positive emotional states prevailed in both rearing systems, the scores tended to be significantly higher in the free-stall than in the tied system (79.4 and 65.2, respectively). There were differences in the criterion of social behaviour. Contrary to our expectations, higher scores were achieved in tied system than in free-stall rearing. The results showed a higher frequency of cohesive and especially agonistic interactions between the heifers in tied rearing system (72.7 for tied and 55.7 for free-stall). In tied housing, the heifers have less space than in free-stall housing, so they spend their time (when they would otherwise be moving around) grooming each other. Studies have shown that this is due to the restrictions on movement (Popescu et al., 2013). Here, the protocol has been shown to have shortcomings that would need to be addressed to achieve a more realistic outcome. For example, there are some omissions in the equations and in the final scores. As mentioned earlier, tied rearing scores are better than free-stall in the behavioural principle due to the time spent on grooming. In the case where no access to outdoor or grazing is possible, the score is 0, which has a significant impact on the final score. It should also be emphasised that the evaluation of QBA is highly subjective, even if the subjectivity is somewhat mitigated by the wide range of different emotional states. Also, agonistic and socio-positive behaviours in animals can change multiple times daily (fluctuation in emotional state) as found by Kirchner et al. (2014b). Nevertheless, some heifers gain weight faster than others, even when eating the same ration, so scoring body condition of calves is not always a relevant indicator.

According to the results, the most important factor in cattle rearing is the space available for the animals. In case of tied system, the animals had the same rearing area during the whole fattening period, i.e. long stalls of 1.95 m × 0.8 m. In free-stall system, an area of 2.5 m^2/animal is recommended for young cattle (220 kg). During this period, an area of 2.7 m^2/animal was provided. The problem occurred in the finishing phase, in which the recommended area per animal is 4.2 m^2. To ensure an optimal floor area, the barn would need to be enlarged by 35%. This is not a restriction, but a recommendation (IURŽ, 2014). If the optimal free-stall area had been achieved, this would have resulted in a higher score. The movement of the animals and a larger floor area contribute to better welfare, but could lower profit (Ahmed et al., 2020).

In summary, tied rearing system scored slightly better in the behaviour principle (a higher number of cohesive behaviours), while free-stall scored significantly better in terms of good housing, due to the larger exercise area, larger floor area and good feeding (where the animals have more drinkers). Otherwise, there were no major differences between the rearing systems. Low scores for a specific criteria are characteristic of both smaller and larger farms (the same score regardless of the size of the farm) (Gottardo et al., 2009).

a)

— Tied rearing   ---- Free-stall rearing

b)
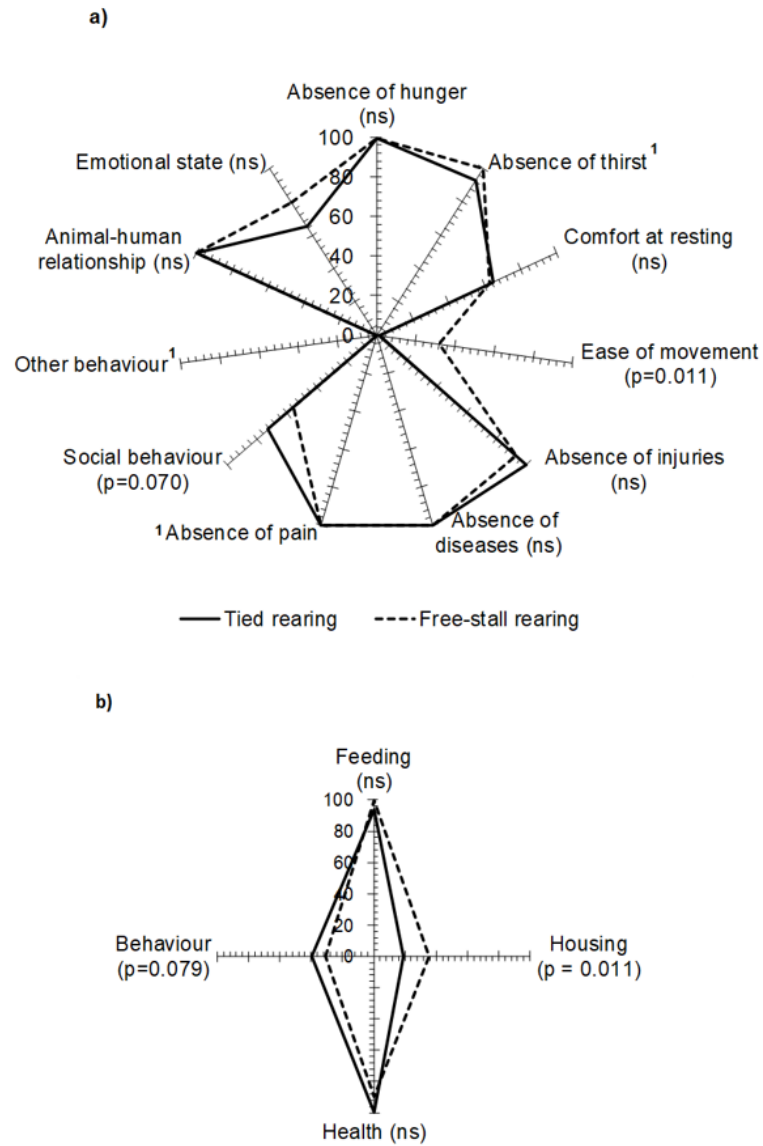
ns – not significant (p≤0.05), [1]no variation within one or both rearing systems (no statistical test applied)

Figure 1: Comparison of criterion scores (a) and principle scores (b) in tied and free-stall rearing

Table 1: Results of assessment using Welfare Quality protocol and calculation of scores[1]

Principle	Criterion	Measurement/ observation	Results		Criterion score		Principle score	
			Tied rearing	Free-stall rearing	Tied rearing	Free-stall rearing	Tied rearing	Free-stall rearing
Feeding	Absence of hunger	% of lean cows	0.0 [0.0–0.0]	0.0 [0.0–20.0]	99.4 [99.4–99.4]	99.4 [5.7–99.4]	93.5 [93.5–93.5]	99.6 [30.2–99.6]
	Absence of thirst	No. of drinking places, no. of cows per drinker, cleanness of drinkers	One drinker per 2 heifers, access to one drinker only, cleanness OK	Two drinkers per 5 heifers, access to two drinkers, cleanness OK	93.0 [93.0–93.0]	100.0 [100.0–100.0]		
Housing	Comfort around resting	Time needed to lie down (seconds)	4.6 [4.0–5.3]	4.9 [4.4–5.5]	64.7 [47.0–86.0]	62.5 [44.7–91.3]	19.1 [11.3–26.4]	35.7 [30.9–79.53]
		Cleanness of the animals (% of dirty cows)	20.0 [0.0–40.0]	20.0 [0.0–40.0]				
	Ease of movement	Pen features according to the weight of animals (m^2/700 kg live weight)	2.3 [1.7–3.2]	4.0 [3.2–6.2]	1.7 [0.0–15.2)	31.8 [15.7–75.4]		
		Access to outdoor loafing area or pasture	No access	No access				
Health	Absence of injuries	Lameness (% of lame cows)	No lame cows	No lame cows	99.8 [86.7–99.9]	93.0 [75.4–99.8]	99.8 [89.8–100.0]	89.8 [68.9–94.6]
		Integument alterations (% of cows with mild and severe alterations)	Mild: 0.0 [0.0–40.0] No severe cases	Mild: 20.0 [0.0–60.0] No severe cases				
	Absence of disease	Mortality and different symptoms (nasal, ocular discharge, coughing, hampered respiration, diarrhoea, bloated rumen)	No warning or alarm threshold exceeded	No warning or alarm threshold exceeded	100.0 [100.0–100.0]	100.0 [100.0–100.0]		
	Absence of pain	Dehorning – method and use of medicines	Not applied	Not applied	100.0 [100.0–100.0]	100.0 [100.0–100.0]		
Behaviour	Expression of social behaviour	Mean number of agonistic behaviours per cows per hour	0.9 [0.1–1.2]	2.6 [2.3–5.0]	72.7 [68.5–95.1]	55.7 [21.6–67.3]	39.6 [35.9–41.6]	30.8 [29.7–37.8]
		Mean number of cohesive behaviours per cows per hour	3.3 [1.8–3.7]	2.3 [1.9–4.0]				
	Expression of other behaviours	Access to pasture	No access	No access	0.0 [0.0–0.0]	0.0 [0.0–0.0]		
	Human-animal relationship	Avoidance distance (% of animals): 0 cm (can be touched)	100.0 [100.0–100.0]	100.0 [60.0–100.0]	100.0 [100.0–100.0]	100.0 [77.9–100.0]		
		< 50 cm	0.0 [0.0–0.0]	0.0 [0.0–0.0]				
		50–100 m	0.0 [0.0–0.0]	0.0 [0.0–0.0]				
		> 100 cm	0.0 [0.0–0.0]	0.0 [0.0–0.0]				
	Emotional state	Qualitative behaviour assessment			65.2 [63.2–77.0]	79.4 [70.2–89.2]		

[1]The results are presented as median [first quartile–third quartile].

Temporal dynamics of heifer welfare in free-stall and tied system

A comparison of the criteria and principles in relation to the age of the heifers in tied and free-stall system is shown in Figure 2. With regard to the feeding principle, there were no differences between the two rearing systems in terms of temporal dynamics. Overall, welfare increased with age in both systems. In line with the general assessment, the criterion scores for the absence of hunger showed a similar temporal trend: they were lowest when the animals were moved into the study pens and reached maximum values in
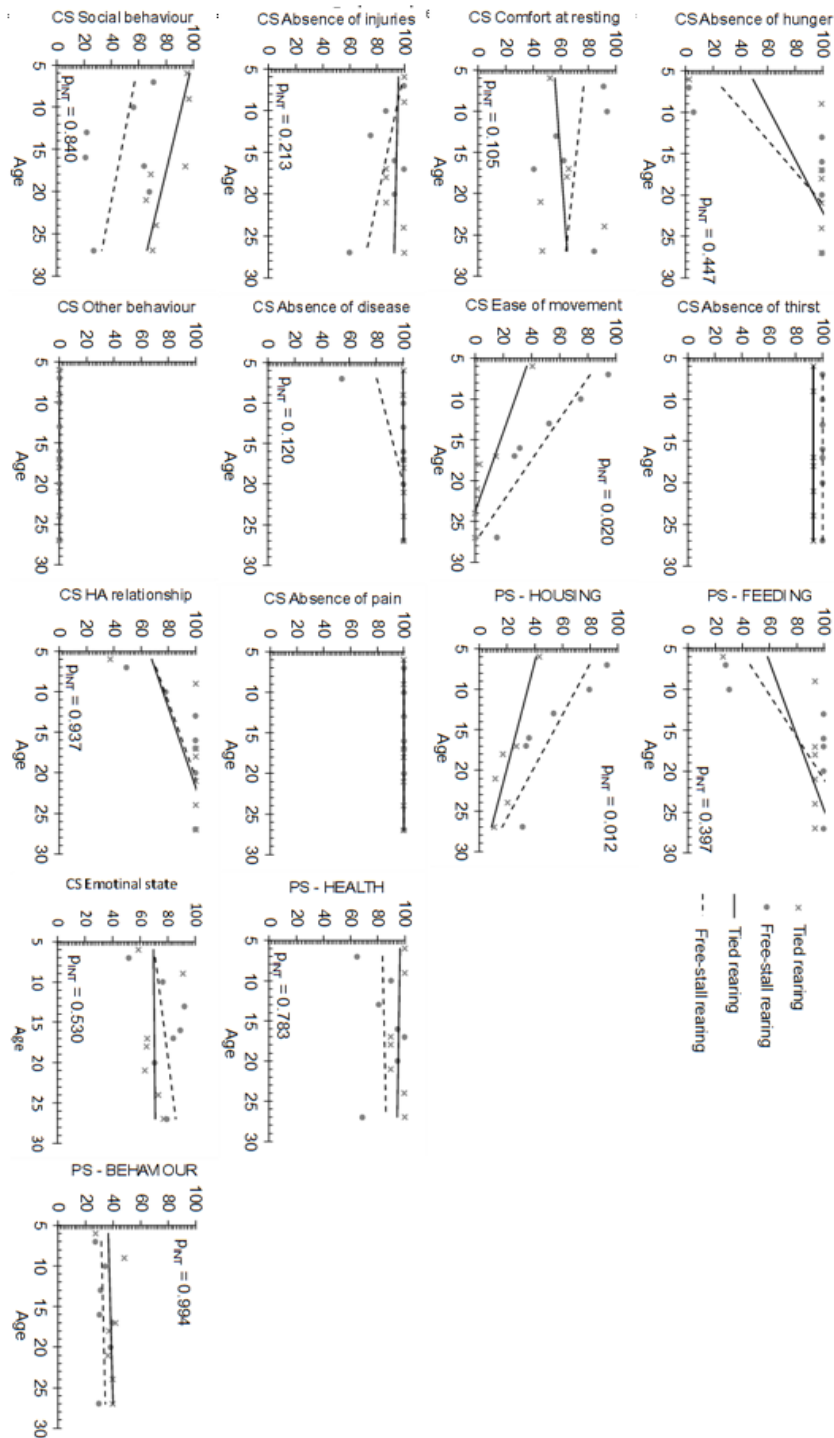
CS – criterion score; PS – principle score; HA – human-animal; p_{INT} – p value for interaction Rearing system × Age

Figure 2: Temporal dynamics of welfare assessments in tied and free-stall system

both systems by the third assessment. However, the lower initial scores were probably the ongoing effect of the conditions from which the animals came and not of the system to which the animals were moved in. These results suggest that the first observation should be carried out later (2 weeks after the animals were housed), which is in agreement with recommendation for ruminant research in nutritional study (Machado et al., 2016). The water supply was constant within the rearing system during the observation period (no variation), and consequently scores were at the same level throughout the fattening period (93 for the tied system and 100 for the free-stall system). The number of drinkers did not change during fattening and the score remained the same, as observed also in the study of Popescu et al. (2013).

In contrast to the feeding principle, significant differences were found in the temporal dynamics of the rearing principle between the rearing systems studied. At the beginning of the fattening period, the scores for the free-stall system were considerably higher. In both systems, the animal welfare scores decreased with age (larger animals and thus less space for movement), but more rapidly in the free-stall system. Younger animals require less space and therefore have more freedom of movement (better scores). As body weight increases, space becomes limited, which was the reason for the lower scores for this criterion.

No differences in the temporal dynamics of welfare scores were found for the health principle. In both systems, the scores were very high and mainly constant over the entire observation period. The slightly lower score on the health criteria for the absence of disease in young animals could also be due to transportation. The slight decrease in the criterion score for the absence of injuries in the free-stall system is a consequence of the occurrence of lameness, which increases with age. In this system, the animals have more opportunity to move and express their emotions, instincts, etc., which could lead to leg injuries and consequently lameness. The percentage of lameness would be even higher in males when they reach sexual maturity (Lunstra et al., 19878). It is worth noting that there was a difference in the flooring, because free-stall animals were kept on concrete slats, whereas animals in tied rearing had bedding (straw). Straw is less aggressive for legs and consequently there are fewer injuries and health problems (Tuyttens, 2005). In the study of Eldahshan et al. (2023), it was found that free-stall rearing heifers were more resistant due to the higher leukocyte counts.

There were no differences in the final score for behaviour. The criterion scores for social behaviour were higher in the tied system, as the heifers spent more time grooming each other, but decreased over time in both systems. As the animals had no opportunity to graze, the criterion score for other behaviour was lowest in both systems. Criterion scores for human-animal interactions

were initially lower (again, this is a long-lasting effect of the previous rearing conditions, namely free-stall pasture system with little human interaction), but rose quite rapidly to the highest score in both rearing systems, showing that calves that have come to the farm from pasture quickly become accustomed to being close to the breeder. It was also found by Masebo et al. (2023) that the immediate assessment of animal welfare after transportation leads to lower scores due to stress (new environment and feed, mixing of animals). The free-stall system provides better conditions for the expression of positive emotional states, as criterion scores increased over time. Another study also argues that free-stall housing is better suited for expressing emotions (Eldahshan et al., 2023). As a result of the temporal dynamics of all four criterion scores, the principle score for behaviour was similar in both rearing systems and constant during the observation period.

In summary, the temporal dynamics of the welfare scores did not differ between tied and free-stall rearing system except for the housing principle. Free-stall housing in general offered better conditions. However, with increasing age of the heifers, the criterion and principle scores decreased over time in both systems, but more rapidly in the free-stall system. The heifers gained weight and, as a result, there was less space available for normal lying and exercise.

Conclusion

Although animal welfare parameters did not differ in all aspects between rearing systems, animal welfare was generally higher in free-stall systems mainly de to higher scores for housing conditions. Our results confirmed tied stall less suitable for young animals in particular. If both systems are present in the breeding facilities, breeders should pay particular attention to ensure that young animals are primarily kept in free-stall system.

Acknowledgment

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Dobro počutje telic različnih starosti v dveh sistemih reje

IZVLEČEK

Dobro počutje domačih živali, ki je premisa sodobne živinoreje, je močno odvisno od sistema reje. V govedoreji je sistem vezane reje še vedno zelo pogost, čeprav zaradi omejene možnosti gibanja velja za manj primernega. Alternativa temu sistemu je kot minimalni standard predlagana hlevska prosta reja, ki živalim omogoča prosto gibanje na omejenem območju. Čeprav se zdi samoumevno, da je prosta reja boljša od vezane, še vedno ni raziskav o tem, ali to velja za vse kategorije in starosti govedi. Namen raziskave je bil primerjati dobro počutje telic v vezani in prosti reji v obdobju pitanja pri različnih starostih. Raziskava je vključevala pet telic v vsakem sistemu na ponovitev (skupaj 20 živali). Počutje telic smo ocenili z uporabo protokola Welfare Quality®, ki vključuje oceno štirih opazovalnih področij: krmljenje, bivalni pogoji, zdravje in obnašanje. Meritve in opazovanja živali in hleva se pretvorijo/preračunajo v ocene dobrega počutja od 0 (neprimerno stanje) do 100 (optimalno stanje). Ocenjevanja so bila izvedena sedemkrat v obdobju pitanja (6–27 mesecev starosti) v trimesečnih intervalih. Rezultati so pokazali značilne razlike v ocenah dobrega počutja živali med vezano in prosto rejo le pri bivalnih pogojih ter tendenco razlik pri obnašanju. Pri obeh področjih so bile ocene razmeroma nizke v primerjavi s področjem krmljenja in zdravja živali, kjer med sistemoma reje ni bilo ugotovljenih razlik. Tudi časovna dinamika ocen meril in področij je bila značilno različna le pri bivalnih pogojih. Pri obeh sistemih reje so se vrednosti s starostjo zmanjševale. V sistemu proste reje so bile ocene pri mladih živalih skoraj optimalne (> 90), a so se s starostjo hitro znižale, v sistemu vezane reje pa ocene niso bile optimalne že pri mladih živalih (≈ 40). Rezultati kažejo, da je vezana reja manj primerna z vidika dobrega počutja živali zlasti za mlade živali. Zaradi tega je priporočljivo, da se mlade živali, če sta v vzrejnih objektih na voljo oba sistema, nastanijo v ograde s prosto rejo.

Ključne besede: dobro počutje živali, govedo, telice, sistem reje, protokol ocenjevanja