Journal of Central European Agriculture, 2014, 15(2), p.95-108 DOI: 10.5513/JCEA01/15.2.1459

Comparison of welfare of cows kept on organic and conventional farms using Animal needs index system

Porovnanie welfare kráv chovaných na ekologických a konvenčných farmách použitím systému hodnotenia Animal Needs Index

Jana KOTTFEROVÁ*, Tomáš JAKUBA, Jana MAREKOVÁ, Jana KIŠOVÁ, Magdaléna FEJSÁKOVÁ and Olga ONDRAŠOVIČOVÁ

University of Veterinary Medicine and Pharmacy in Košice, Komenského 73, 041 81 Košice, Slovakia, kottfer@uvm.sk *correspondence

Abstract

The aim of the study was to compare and evaluate the welfare of cows kept on two conventional and two organic farms using Animal Needs Index (ANI) system. The system is rapid and easy to use. Its most important advantage is that it provides a final score and thus allows one to rate the evaluated object on a scale reflecting the level of welfare on the respective farm and thus compare farms with different ways of housing. The system showed a very good welfare level on two of four evaluated farms, both with free housing of cows, one organic and one conventional.

Keywords: Animal Need Index, cattle, evaluation, welfare

Abstrakt

Cieľom práce bolo porovnanie a hodnotenie welfare kráv chovaných na dvoch konvenčných a dvoch ekologických farmách použitím hodnotiaceho systému Animal Needs Index (ANI). Tento spôsob hodnotenia welfare posudzujeme ako rýchly a ľahký pre použitie v praxi. Jeho najväčšia výhoda je že poskytuje výsledné skóre a tak umožňuje hodnotiť objekty ustajnenia pomocou stupnice hodnôt, ktoré odrážajú úroveň welfare na konkrétnych farmách a taktiež porovnávať farmy s rôznym spôsobom chovu zvierat. V našej práci systém hodnotenia ANI poukázal na veľmi dobrú úroveň welfare na dvoch zo štyroch hodnotených fariem, obe boli s voľným ustajnením kráv, jeden ekologický a druhý konvenčný chov.

Kľúčové slová: Animal need index, dobytok, hodnotenie, welfare

Detailný abstrakt

Záujem o problematiku welfare domestikovaných zvierat sa v poslednom období výrazne zvyšuje. Stanovenie welfare zvierat predstavuje hodnotiaci problém, ktorý vyžaduje stratégiu založenú na informáciách získaných na základe mnohých meraní. Zloženie týchto meraní závisí na špecifických vlastnostiach, napr. konkrétny koncept welfare, použité merania, spôsob získavania dát. Za týmto účelom je snaha definovať systém, ktorý bude môcť byť používaný rutinne na rôznych farmách v rámci celej Európy, ktorý bude reagovať na rozdiely vo welfare zvierat na týchto farmách, odrážať stav welfare stáda ako celku, zároveň bude transparentný pre producentov, obchodníkov aj zákazníkov a zároveň musí korelovať so súčasným stavom poznania welfare zvierat. Parametre stanovenia welfare môžeme rozdeliť na dve základné kategórie. Prvou sú parametre odrážajúce kvalitu prostredia a manažmentu (enviromentálne parametre) napríklad: rozmery ustajňovacích priestorov, dostupnosť a kvalita kŕmnych a napájacích zariadení, kvalita podstielky, prístup na pastvu a pod. Ustajnenie a spôsob manažmentu nevyhnutne determinuje welfare zvierat. Napriek tomu môžeme zistiť obrovské rozdiely v úrovni welfare v chovoch s podobnými environmentálnymi parametrami. Preto parametre založené na pozorovaní zvierat v ich špecifickom prostredí („animal-based“ alebo animálne parametre) môžeme považovať za veľmi dôležité pre stanovenie úrovne welfare hodnotiacej sumy.

Cieľom práce bolo porovnanie vplyvu rôznych systémov chovu na welfare zvierat prostredníctvom hodnotenia welfare na farmách využitím rakúskeho hodnotiaceho systému ANI (Animal Needs Index). ANI bol vyvinutý na stanovenie welfare u hovädzieho dobytka, ošípaných a nosníc so zreteľom najmä na ekologické poľnohospodárstvo. Tento systém stanovuje dopad ustajňovacích priestorov na welfare zvierat. Väčšina sledovaných parametrov sú práve environmentálne ukazovatele. Animálnych parametrov je stanovovaných len niekoľko. Hodnotenie stavu welfare na farme sa robí na základe jednorázovej návštevy, po ktorej nasleduje vyhodnotenie zozbieraných dát. ANI je veľmi praktický a ľahko opakovateľný. Na základe záverečného indexu je možné hodnotené farmy zatriediť do šiestich skupín.

Stanovenie welfare bolo vykonané na 4 farmách, 2 konvenčných a 2 ekologických. Hodnotenou kategóriou zvierat boli dojnice, resp. dojné kravy. Na nami hodnotených farmách systémom ANI sme získali údaje v Tab 1 – 4.

Naše celkové hodnotenie welfare na farmách ukázalo, že dve farmy (č. 1 a č. 4) boli zaradené do najvyššej welfare kategórie – jednalo sa o jednu ekologickú a jednu konvenčnú farmu, obe s voľným ustajnením kráv. Obe farmy (č. 2 a č. 3), kde chovali dojnice väzným spôsobom ustajnenia, boli hodnotené ako menej vhodné z hľadiska welfare.

Výhodou tejto ANI metódy je, že umožňuje, v rovnakom čase hodnotiť rôzne kategórie hospodárskych zvierat (dojnice a dojčiace kravy bez produkcie mlieka, zvieratá s voľným a väzným ustajnením) a berie do úvahy zvieratá s rohmi a bezrohé. Vyhodnotenie jednotlivých oblastí vplyvu (pohyb, sociálny kontakt, kvalita podlahy, mikroklíma, starostlivosť o chovateľa - ľudský faktor) je jasné a prehľadné a umožňuje odhaliť nedostatky v príslušných oblastiach a prijať vhodné opatrenia. Konečný výsledok umožňuje klasifikovať hodnotenú farmu do 6 kategórií stupnice welfare a tak porovnávať aj farmy s rôznym systémom chovu. Avšak je potrebné zdôrazniť, že aj tento typ hodnotenia by mal byť doplnený a rozšírený o ďalšie parametre zvierat, ktoré odrážajú jeho stav (animal – based parameters).

Introduction

Assessment of animal welfare presents an evaluation problem requiring strategy based on information obtained by many measurements. Structure of these measurements depends on specific properties, e.g. concrete welfare concept, measurements used, way of data obtaining. Welfare measurements may differ in accuracy, relevance and relative importance for overall well-being. The data obtained are expressed frequently on ordinal scales with limits representing evaluation or relativity of evaluation and their summarization. Because an increasing interest in assessment of welfare was initiated by the aim of consumers to improve animal welfare it was necessary to develop a system of welfare assessment that can supply information and guarantees about both product quality and animal-friendly way of animal housing and care of stockman (Blokhuis et al., 2003). Following this purpose it appeared necessary to define a system that can be used routinely on various farms throughout the Europe, respond to differences in welfare on the farms, reflect welfare of the herds and, at the same time, appear transparent to producers, tradesmen and consumers and correlate with the present state of knowledge in the field of animal welfare (Botreau et al., 2007).

In Austria an „Animal Needs Index" – ANI („Tiergerechttheitsinindex" – TGI) has been in development since 1985 (Bartussek, 1999). In Germany a similar system with similar name was developed (Sudrum et al., 1994). The purpose of ANI was to assess welfare of cattle, pigs and laying hens focusing particularly on organic farms. ANI concentrates on housing conditions and on their influence on animal welfare. It includes only several animal-based parameters.

In Europe several projects were involved in studies oriented on objective evaluation of animal welfare. The main aim was to develop for farmers a detailed analysis of welfare of their herds and at the same time to indicate the ways of potential improvement. The influence of housing and management on cattle in Switzerland was analysed using multivariate statistical methods and the results provided information which of the housing parameters are most important for welfare of the herd (Johnsen et al., 2001). A method developed in France used multidimensional diagnostic tools to determine welfare on farms (Capdeville and Veisser, 2001). Various methods were tested in England in an effort to ensure objective assessment of farm animal welfare (Whay et al., 2003a, Burkholder, 2000, Whay et al., 2002, Wechsler et al., 2000, Purcell et al., 1988, Fisher et al., 2000). The studies mentioned served as a basis for development of BWAP - British Welfare Assurance Programme (www.vetschool.bris.ac.uk/animalwelfare, 2004). The scientists in Italy developed new methodology for determination of welfare of dairy cows and fattening cattle. This system was referred to as FWI – (Farm Welfare Index, abbreviation used in Italy – IBA) (Barbari et al., 2007).

Despite relatively high number of relevant studies, each system of evaluation of animal welfare has some inadequacies as it is oriented only on certain field of welfare of farm animals.

To determine the influence of different systems of keeping on animal welfare it is necessary to find a suitable system for determining welfare standards that could be applied under various conditions. For this reason the aim of the study was to evaluate and compare welfare of cows on selected conventional and organic farms using the Animal Needs Index (ANI) system (Bartussek et al., 2000) a to verify suitability of this way of welfare evaluation under practical conditions.

Material and Methods

Animal welfare was evaluated on 4 farms in Slovakia, 2 conventional and 2 organic. The evaluated category were dairy cows and nursing cows without production of milk.

Characteristics of evaluated farms

Farm No. 1 was a conventional farm located approximately 220 m above sea-level. The mean number of dairy cows on the farm was 363 (80 % Black-spotted Holstein, 10 % Red-spotted Holstein, 7 % Slovak spotted and 3 % crossbreds). The mean milk yield on the farm was 6140 l per year per cow. An open herd system was practised purchasing heifers in calf. Insemination was artificial. Evaluation included a house for dairy cows with free-housing system. The cows had access to a cattle-run but not to pasture.

Farm No. 2 was a conventional farm located 256 m above sea-level. The number of cows on this farm reached 220 on average. The cows were tethered and could graze on pasture approx. 200 m away from the house. The milk yield at the period of observation was 3900 l/year/cow. In 2007 the milk yield on this farm was lower (2000 l/year/cow) particularly due to serious errors in nutrition. The cows were inseminated artificially. There was a closed herd system on the farm with heifers kept in the herd and bulls transferred for fattening to another section of the farm.

Farm No. 3 was located 800 – 900 m above sea-level. This was an organic farm with approx. 120 dairy cows in the herd. The cows were housed in two houses, they were tethered and no dehorning was practised on the farm. The animals grazed on pasture next to the farm. The mean milk yield was approx. 4400 l/year/cow. The insemination was artificial. The structure of the herd was affected significantly by one positive BSE finding in 2007. The cows were crossbred of Slovak spotted cattle. There was a closed herd system on the farm with irregular replacement of culled animals.

Farm No. 4 was an organic farm located 900 – 1400 m. above sea-level. The nursing cows without production of milk on the farm were Pinzgau crossed with Limousine and the proportion of Limousine gradually increased. The cows were dehorned. There was a natural mating system using bulls housed together with dairy cows. Approximately from half of May till half of November the animals were kept in pen-folds on pasture and for the remaining period they were housed using a free housing system.

Evaluation by ANI 35L/2000

To evaluate the welfare of dairy cows we used the Animal Needs Index system – ANI (Bartussek et al., 2000). Evaluation by this system focuses on five fields of influence, namely movement, social contact, quality of flooring, climatization and care of stockman (human factor). The final ANI evaluation consisted of assigning points for relevant criteria which allowed us to classify the farms using a 6-category system of welfare:

- < 11 = not suitable with respect to welfare
- 11 – < 16 = scarcely suitable with respect to welfare
- 16 – < 21 = little suitable with respect to welfare

- 21 – 24 = fairly suitable with respect to welfare
- > 24 – 28 = suitable with respect to welfare
- > 28 = very suitable with respect to welfare

Results

Using the Austrian ANI system for evaluation of the investigated farms we obtained the following data:

Tab. 1: Farm No. 1 – ANI evaluation – list No..6 “Summary evaluation“
Farma č. 1 – hodnotenie ANI – list č.6 “Sumárne hodnotenie“

Categories	Columns							Total
	a)	b)	c)	d)	e)	f)	g)	
I. Locomotion	loose/group housing		tether systems		outdoor excercise days/year	pasture days/year		9.0
	floor area	lying down, rising	cubicle/ stall size	movement of tether				
	3.0	3.0			3.0	0.0		
II. Social interaction	floor area	herd structure	young	outdoor excercise days/year	pasture days/year			7.0
	3.0	1.0	0.5	2.5				
III. Flooring	lying area			activity areas	outdoor yard	pasture		7.0
	softness	cleaniliness	slipperi-ness					
	2.5	0.5	1.0	0.5	1.0	1.5		
IV. Light & air	light	air quality	draught	noise	outdoor excercise days/year	outdoor hours/day		8.5
	1.0	1.5	1.0	1.0	2.0	2.0		
V. Stockmens hip	cleaniliness	condition of equipment	condition of integument	cleaniliness of animals	condition of hooves	techno-paties	health	5.0
	0.5	1.0	0.5	0.0	1.0	1.0	1.0	
Total = ANI								**36.5**

Tab. 2: Farm No. 2 – ANI evaluation – list No..6 “Summary evaluation“
Farma č. 2 – hodnotenie ANI – list č.6 “Sumárne hodnotenie“

Categories	Columns							Total
	a)	b)	c)	d)	e)	f)	g)	
I. Locomotion	loose/group housing		tether systems		outdoor excercise days/year	pasture days/year		5.0
	floor area	lying down, rising	cubicle/ stall size	movement of tether				
			0.0	0.5	3.0	1.5		
II. Social interaction	floor area	herd structure	young	outdoor excercise days/year	pasture days/year			4.5
	0.0	0.0	0.5	2.5	1.5			
III. Flooring	lying area			activity areas	outdoor yard	pasture		1.5
	softness	cleaniliness	slipperi-ness					
	0.5	-0.5	0.0	0.5	-0.5	1.5		
IV. Light & air	light	air quality	draught	noise	outdoor excercise days/year	outdoor hours/day		4.5
	-0.5	0.5	0.0	1.0	2.0	1.5		
V. Stockmens hip	cleaniliness	condition of equipment	condition of integument	cleaniliness of animals	condition of hooves	techno-paties	health	3.0
	0.5	0.5	0.5	-0.5	0.5	1.0	0.5	
Total = ANI								**18.5**

Tab. 3: Farm No. 3 – ANI evaluation – list No..6 “Summary evaluation“
Farma č. 3 – hodnotenie ANI – list č.6 “Sumárne hodnotenie“

Categories	Columns							Total
	a)	b)	c)	d)	e)	f)	g)	
I. Locomotion	loose/group housing		tether systems		outdoor excercise days/year	pasture days/year		4.5
	floor area	lying down, rising	cubicle/ stall size	movement of tether				
			0.0	1.0	2.0	1.5		
II. Social interaction	floor area	herd structure	young	outdoor excercise days/year	pasture days/year			3.0
	0.0	0.0	0.0	1.5	1.5			
III. Flooring	lying area			activity areas	outdoor yard	pasture		4.5
	softness	cleaniliness	slipperi-ness					
	1.5	0.0	0.0	0.5	1.0	1.5		
IV. Light & air	light	air quality	draught	noise	outdoor excercise days/year	outdoor hours/day		6.5
	0.5	1.0	0.5	1.0	1.5	2.0		
V. Stockmens hip	cleaniliness	condition of equipment	condition of integument	cleaniliness of animals	condition of hooves	techno-paties	health	3.0
	0.5	0.5	0.0	-0.5	1.0	1.0	0.5	
Total = ANI								**21.5**

Tab. 4: Farm No. 4 – ANI evaluation – list No..6 “Summary evaluation“
Farma č. 4 – Hodnotenie ANI – list č.6 “Sumárne hodnotenie“

Categories	Columns							Total
	a)	b)	c)	d)	e)	f)	g)	
I. Locomotion	loose/group housing		tether systems		outdoor excercise days/year	pasture days/year		7.5
	floor area	lying down, rising	cubicle/ stall size	movement of tether				
	3.0	3.0			0.0	1,5		
II. Social interaction	floor area	herd structure	young	outdoor excercise days/year	pasture days/year			7.5
	3.0	2.0	1.0	0.0	1.5			
III. Flooring	lying area			activity areas	outdoor yard	pasture		5.5
	softness	cleaniliness	slipperi-ness					
	2.5	0.5	1.0	0.5		1.0		
IV. Light & air	light	air quality	draught	noise	outdoor excercise days/year	outdoor hours/day		6.5
	1.0	1.0	1.0	1.0	1.5	2.0		
V. Stockmenship	cleaniliness	condition of equipment	condition of integument	cleaniliness of animals	condition of hooves	techno-paties	health	6.0
	1.0	0.5	1.0	0.0	1.5	1.0	1.0	
Total = ANI								**33.0**

Evaluation of the investigated farms

The results obtained allowed us to assess animal welfare on the respective farms as follows:

Farm No. 1

Of the 4 farms evaluated by the ANI system this farm obtained the highest number of points – 35.0 from 45.5 points (76.92 %) which corresponds to very suitable welfare. From the point of view of animal hygiene the housing facilities were the best. There was an ample housing space with sufficiently clean deep bedding. Animals did not graze on pasture but had access to a small (as evaluated by ANI) as well as large cattle run. The access to run was limited – depending on weather - and they had to share it with animals from the neighbouring object. In the small run there were heaps

of hay which were are used by animals for resting and a non-typical form of comfort-behaviour as the animals tossed the hay up on themselves using either muzzle or head movements.

Farm No. 2

This farm rated as the worst from among all investigated farms when using the ANI system – 18.5 points (40.66 %) – and was included in the category little suitable with respect to animal welfare. Serious shortcomings were observed regarding the housing: cleanliness, slipperiness, insufficient lighting, draft. In 2007 the milk yield on this farm decreased down to less than 2000 l/year/cow. According to information that we were able to obtain this was caused by unsuitable and foul feed. This resulted in dramatic deterioration of health and subsequently also productive parameters. At the time of the experiment the milk yield varied around 3900 l/year/cow.

Farm No. 3

The system ANI ascribed to this farm 21.5 points (47.25 %) which corresponded to the category fairly suitable. This was a surprising result as this was an organic farm. However, contrary to the requirements on housing on organic farms, the animals were tethered. This was, however, permitted by an exception according to Council Regulation No. 2092/91 on organic production. With regard to high incidence of agonistic behaviour (manifested by skin injuries) at second observation we assumed that hierarchy in this herd was not stabilised. This could result from shorter stay of animals in the cattle run than declared by stockmen or higher number of replacement animals related to occurrence of BSE and subsequent compulsory slaughter of 52 animals.

Farm No. 4

Using the ANI system of welfare evaluation this farm reached 33 points (72.53 %) and was included in the very suitable category. In comparison with the Farm 1 it lost some points for external cattle run as it did not comply with the criteria for area and the area of run was added to the internal area. Another shortcoming was the absence of shelter in pen-folds. Despite that the animals seemed composed and no pathological changes were observed. This was the only one of the four farms with the herd of family type.

Discussion

The Animal Needs Index considers five components of the animal's environment, (I) the possibility of mobility, (II) social contact with members of the same species, (III) condition of the floors on which animals are lying, standing and walking, (IV) stable climate (including ventilation, light and noise) and (V) the intensity of human care (Bartussek, 1999). Locomotion disorders are frequent problems in dairy cow herds. This is also the first category in the ANI system. Our observation showed no serious locomotion disorders on the investigated farms. Bartussek (1999) in his study assigned different number of points to tethered (maximum 6.5 points) and free housing (maximum 10.5 points). Tethered housing was assigned less points because of considerable restriction of animal movement. In this evaluation the best results were obtained for Farm No. 1 (85.71 %) and the worst for Farm No. 3 (69.2%).

Locomotion scoring is a valuable tool when assessing the prevalence of lameness and animal welfare in freestall herds. (Fjeldaas et al., 2011). Most lame cows have an

arched back, and many of these systems are based on scoring the posture of the back when standing and walking. Even so, cows that are obviously lame do not always show such signs (Thomsen et al., 2008). Telezhenko and Bergsten (2005) showed that cows with severe claw disorders walk more slowly and with shorter strides than do cows with healthy feet. The conformation, flooring, and bedding of cubicles have been shown to have a significant influence on lying time, cleanliness, and claw health (Leonard et al., 1994; Faull et al., 1996; Cook et al., 2004). The parameters mentioned are also part of ANI (Category I) evaluation.

In addition to individual factors, locomotion is also dependent on the characteristics of the floor. The most important shortcoming on the investigated farms was insufficient cleanliness of the resting area, particularly on Farm No. 2, which was rated the lowest (-0.5) of the possible rating (1 point). The floor on this farm was concrete, slippery and strongly contaminate with excrements. Because of that it obtained in this category only 18.75% of possible points which was the lowest evaluation of all observed farms. Better rating deserved Farms No. 1 and 4, which obtained 2.5 points of possible 3, because they used straw as a bedding which made the resting area more comfortable. In literature one can find a number of studies involved in relevant research, for example Mülling and Budras (1998), reported that manure and urine have a detrimental effect on claw horn and that claw horn tissue absorbs water and becomes softer and, therefore, more sensitive to damage (Borderas et al., 2004).The explanation for this is that there is probably often more manure and urine in alleys with solid than with slatted flooring, which results in softer skin and horn on solid floors.

Social behaviour is presented by positive and negative manifestations. Particularly these manifestations are evaluated by ANI within category II. Literary sources describe manifestations of good welfare within the following six behavioural ranges (Fraser, 1999): comfort behaviour, resting, willingness to associate, locomotory activity, exploring and territorial behaviour. The elements that indicate psychical welfare of an individual include self-cleaning activities, playful behaviour and taking up comfortable position. Grooming (licking body surface, feather adjustment and similar) and stretching, i.e., signs of proper comfort behaviour, playfulness, indicate “good” welfare (Boissy et al. 2007). Increased agonistic behaviour indicates instability of the group (Hovland, 2010), insufficient space (Keeling, 1995) or environment lacking in stimuli (Beattie, 1996). Signs of discomfort include uneasiness, depression, anorexia, decreased activity, apathy and ehtopathies. The animal’s body language points to its internal status. One can evaluate position of ears or tail or movements (Pritchard et al., 2005, Reefmann et al., 2009). Particularly some of these behavioural manifestations are used by ANI. Unsuitable social manifestations of animals were most pronounced on Farm No. 3 which was indicated by total score of 3.0 points (42.86 %). The animals on this farm were tethered and in case of suitable climate conditions they were allowed to go to pasture. No stable hierarchy was established in these animals also due to frequent purchase of new animals. Because of that, in this parameter the farm obtained rating 0. Farms No. 2 and No. 1 obtained rating 0.5 because calves on these farms were reared in a separate house which prevented social contact with their mothers or other animals in the herd. Bioclimate is a limiting factor affecting health and welfare of animals and eventually also economy of the herd. This includes maintaining acceptable temperature and relative humidity in the house and keeping the concentration of harmful gases as low as possible (Ondrašovičová, 2010). Microclimate in animal housings is one of

important factors affecting productivity and health of animals. Adverse microclimate supports the so-called stable fatigue and development of multifactorial diseases and may result in circulation of avirulent but also virulent micro-organisms in the environment (Gregová et al., 2011).This extensive area as addressed by the IVth category of ANI. With regard to the bioclimate, particularly illumination, the worst results were obtained on Farm No. 2 (-0.5 of maximum 2 points), as the house was very dark and the levels of ammonia and CO_2 were higher. None of the farms obtained maximum points for illumination but there were efforts to compensate for this by suitable runs or taking the animals to pasture.

The man-animal interactions and care of animals are evaluated by the Vth category of ANI. The level of animal hygiene indicates approach of farmers and at the same time affects considerably the outcomes of animal production (Ondrašovičová, 2010). When evaluating the stockmanship, comparisons should consider the operation conditions. The level of stockmanship is evaluated by means of indirect parameters, such as cleanliness of animals and equipment and also its technical status. Other evaluated parameters are condition of skin, hooves and technopathies. For correct determining of score of these parameters one should identify clinical symptoms indicating deviations from normal, healthy state, that are caused by the housing system. Evaluated are also those aspects of animal health which are not affected directly by the equipment or housing conditions. One should consider incidence of infectious and parasitic diseases, overall hygiene, condition of animals and their fertility and mortality. With regard to the stockmenship, the lowest rating received the farms with tethered animals (No. 2, No. 3) where the animals were dirty, had problems with hooves and the level of health. These farms (No. 2 and No 3) obtained only 37.5% of the total possible number of points.

Our total evaluation showed that two farms (No 1 and No 4) were included in the highest welfare category – one organic and one conventional, both with free housing of cows. The two farms (No 2 and No 3) that kept the cows tethered were rated as little and fairly suitable.

Conclusions

Our experience with evaluation of farms by the system ANI 35L (Bartussek et. al., 2000) was very positive as the system is rapid and easy to use in practice. Welfare is assessed by one visit to a farm and evaluation of obtained data. It is very practical and easily repeatable. It is advantageous as it allows one to evaluate and at the same time compare various categories of animals (dairy cows and nursing cows without production of milk, housed free and tethered) and takes into consideration animals with horns and dehorned ones. Evaluation of individual fields of influence (movement, social contact, quality of flooring, microclimate, care of stockman – human factor) is clear and well-arranged and allows one to detect shortcomings in the respective fields and take appropriate measures. The final score enables to classify the evaluated farm on a 6-category welfare scale and thus compare even the farms with different system of housing. However, it should be stressed that even this complex type of evaluation should be supplemented and extended by additional animal parameters reflecting the existing state of the animal

Acknowledgements

This work was supported by the VEGA 1/0727/12

References

Barbari, M., Galstaldo, A., Rossi, P., Zappavigna, P. (2007) Animal welfare assessment in cattle farms. ASABE Annual Meeting, 074162. St. Joseph: American Society of Agricultural and Biological Engineers.

Bartussek, H. (1999) A review of the animal needs index (ANI) for the assessment of animals "well-being" in the housing systems for Austrian proprietary products and legislation. Livestock Production Sci., 61(2–3), 179–192.

Bartussek, H., Leeb, CH., Held, S. (2000) Animal need index for cattle ANI 35L/2000. Irdning: Federal Research Institute for Agriculture in Alpine Regions BAL Gumpenstein.

Beattie, V.E., Walker, N., Sneddon, I.A. (1996) An investigation of the effect of environmental enrichment and space allowance on the behaviour and production of growing pigs. Appl. Anim. Behav. Sci., 48(3), 151–15.

Blokhuis, H.J., Jones, R.B., Geers, R., Miele, M., Veisser, I. (2003) Measuring and monitoring animal welfare: transparency in the food product quality chain. Animal Welfare. 12(4), 445–455.

Boissy, A., Manteuffel, G., Jensen, M.B., Moe, R.O., Spruijt, B., Keeling, L.J., Winckler, CH., Forkman, B., Dimitrov, I., Langbein, J., Bakken, M., Veisser, I., Aubert, A. (2007) Assessment of positive emotions in animals to improve their welfare. Physiology and Behavior., 92(3), 375–397.

Borderas, T.F., Pawluczuk, B., de Passille, A.M., Rushen, J. (2004) Claw hardness of dairy cows: relationship to water content and claw lesions. J. Dairy Sci., 87(7), 2085–2093.

Botreau, R., Bonde, M., Butterworth, A., Perny, P., Bracke, M.B.M., Capdeville, J., Veisser, I. (2007) Aggregation of measures to produce an overall assessment of animal welfare. Part 1: a review of existing methods. Animal, 1(8), 1179–1187.

Burkholder, W.J. (2000) Use of body condition scores in clinical assessment of the provision of optimal nutrition. J of the Amer. Veter. Medic Assoc., 217(5), 650–654.

Capdeville, J., Veissier, I. (2001) A method of assessing welfare in loose housed dairy cows at farm level, focusing on animal observation. Acta Agriculturae Scandinavica, Section A: Animal Science, 51(30), 62–68.

Cook, N.B., Bennett, T.B., Nordlund, K.V. (2004) Effect of free stall surface on daily activity patterns in dairy cows with relevance to lameness prevalence. J. Dairy Sci., 87(9), 2912–2922.

Council Regulation (EEC) No 2092/91 of 24 June 1991 on organic production of agricultural products and indications referring thereto on agricultural products and foodstuffs. Official Journal L, 198, 22.07.1991, 1–15.

Faull, W.B., Hughes, J.W., Clarkson, M.J., Downham, D.Y., Manson, F.J., Metcalf, J.A., Murray, R.D., Russell, A.M., Sutherst, J., Ward, W.R. (1996)

Epidemiology of lameness in dairy cattle: the influence of cubicles and indoor and outdoor walking surfaces. Vet. Rec., 139(6), 130–136.

Fisher, A.D., Morris, C.A., Matthews, L.R. (2000) Cattle behaviour: comparison of measures of temperament in beef cattle. Proc. of the New Zealand Soc of Anim Production, 60, 214–217.

Fjeldaas, T., Sogstad, Å.M., Østerås, O. (2011) Locomotion and claw disorders in Noewegiandairy cows housed in freestalls with slatted concrete, solid concrete, or solid rubber flooring in the alleys. J. Dairy Sci., 94(3), 1243–1255.

Fraser, D. (1999) Animal ethics and animal welfare science: bridging the two cultures. Appl. Anim. Behav. Sci, 65(3), 177–189.

Gregová, G., Venglovský, J., Kmeť, V., Sasáková, N., Ondrašovič, M., Veszelits-Laktičová, K. (2011) Airborne microorganisms in animal housing facilities. Folia Veterinaria, 55(Suppl. I), 41–43.

Hovland, A.L., Akre, A.K., Bakken, M. (2010) Group housing of adult silver fox (*Vulpes vulpes*) vixens in autumn: agonistic behaviour during the first days subsequent to mixing. Appl. Anim. Behav. Sci, 126(3–4), 154–162.

Johnsen, P.F., Johannesson, T., Sandoe, P. (2001) Assessment of farm animal welfare at herd level: Many goals, many methods. Acta Agriculturae Scandinavica, Section A: Animal Science, 51(30), 26–33.

Keeling, L.J. (1995) Spacing behaviour and an ethological approach to assessing optimal space allocations for lzing hens. Appl. Anim. Behav. Sci., 44(2–4), 171–186.

Leonard, F.C., O'Connell, J., O'Farrell, K. (1994) Effect of different housing conditions on behaviour and foot lesions in Friesian heifers. Vet. Rec., 134(19), 490–494.

Mulling, Ch., Budras, K. D. (1998) Influence of environmental factors on horn quality of the bovine hoof. In: C. Lischer and P. Ossent, eds. Proc. 10th Int. Symp. Lameness in Ruminants, Luzerne, 214–215.

Ondrašovičová, O. (2010) Význam uplatňovania welfare v chovoch zvierat z hľadiska zdravia a kvality potravín. Zdravie a pohoda zvierat, medzinárodná vedecká konferencia, Košice, 30. 09. - 01. 10. Košice: UVLF.

Pritchard, J.C., Lindberg, A.C., Main, D C. J., Whay, H.R. (2005) Assessment of the welfare of Working horses, mules and donkeys, using health and behaviour parameters. Prev Vet Med., 69(3–4), 265–283.

Purcell, D., Arave, C.W., Walters, J.L. (1988) Relationship of three measures of behaviour to milk production. Appl. Anim. Behav. Sci., 21(4), 307–313.

Reefmann, N., Kaszàsac, F.B., Wechslera, B., Gygaxa, L. (2009) Ear and tail postures as indicators of emotional valence in sheep. Appl. Anim. Behav. Sci., 118(3), 199–207.

Sundrum, A., Andersson, R., Postler, G. (1994) Tiergerechtheictsindex – 200. Bonn: Institut fűr Organischen Landbau.

Telezhenko, E., Bergsten, C. (2005) Influence of floor type on the locomotion of dairy cows. Appl. Anim. Behav. Sci., 93(3–4), 183–197.

Thomsen, P.T., Munksgaard, L., Togersen, F.A. (2008) Evaluation of a lameness scoring system for dairy cows. J. Dairy Sci, 91(1), 119–126.

Whay, H. (2002) Locomotion scoring and lameness detection in dairy cattle. In Practice, 24(8), 444–449

Whay, H.R., Main, D.C.J., Green, L.E., Webster, A.J.F. (2003) Assessment of the welfare of dairy cattle using animal-based measurements: direct observations and investigation of farm records. The Veterinary Record, 153(7), 197–202.