

THE ASSESSMENT OF DAIRY COWS WELFARE IN A FARM FROM THE NORTH-EAST OF ROMANIA

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Abstract

The objective of this study is to present the findings of a welfare assessment conducted on dairy cows reared in an intensive farming system, in a farm from the north-east of Romania. The assessment utilized well-being indices outlined in the TIERWOHL-CHECK programme, which was designed for German farmers. The results of the assessment, particularly focusing on the body condition score (BCS) of RM and late-gestation period female cows, indicate elevated percentages of overweight cows, ranging from 30.77% to 37.5%. Additionally, the prevalence of lame animals was notably high (28%, surpassing the recommended threshold of 10%). These welfare indices serve as indicators of the extent to which optimal rearing conditions are maintained, and the findings underscore the necessity for prompt interventions to enhance various aspects such as the comfort of lying spaces, the quality of bedding, and certain housing conditions. These measures are imperative for improving the overall welfare of the animals in question.

Key words: animal welfare, dairy cows, indices.

INTRODUCTION

The welfare of dairy cows is now one of the major concerns of society (Sirovica et al., 2022), the consumers willing to pay more for products obtained from animals whose welfare has not been compromised.

Animal welfare is a concept that considers a holistic approach to all factors related to animal husbandry management and technology. (Freigang et al., 2023; Gieseke, 2022; Nica et al., 2023).

In the European Union strategy named Farm Fork are include provisions on the welfare of dairy cows, The traceability of animal origin products will also include the assessment of farms from this point of view. In order to improve the legislation that protects farm animals, the European Commission advised the European Food Safety Authority (EFSA) to develop assessment indicators for animal welfare based on scientific studies that identify the dangers presented by farming systems. The assessment covers the animal husbandry system through the welfare consequences. Indicators based mainly on animal measurements are used for their relevance, as they are based on the

direct response of organisms to environmental conditions. (EFSA Panel Animal Health & Animal Welfare, 2023).

The concept of animal welfare has developed over time in the sense that if it originally included the freedom of animals to experience a life free from major threats that determine their survival (hunger, thirst, disease, etc.), nowadays it includes notions of emotional states of the animal that it reflects the subjective experience of the animal in relation to lived experiences. Animal welfare is now considered optimal when the balance between positive and negative affective states is generally positive, and several assessment methodologies have been developed based on the concept that the living environment influences animals' affective states and subsequent cognitive biases by conditioning individuals' propensity to experience positive and negative events (Nica et al., 2023; Russell et al., 2023).

Ensuring animal welfare is primarily reflected in the health status of animals and has direct economic implications (Magrin et al., 2023; Owusu-Sekyere et al., 2023; Thomsen & Houe, 2023).

MATERIALS AND METHODS

The herd of dairy cows for which the welfare assessment was made is raised in free standing stables, on compact concrete floors, in stables without paddocks. The rest area is individual (bunk beds) and the bedding is a special carpeted mattress. The waiting area and the movement area are shared. The feed is made from stock and the ration is represented by a mixture of fodder and is of the monodiet type. Feeding is differentiated according to productive performance and physiological state. Watering cans for cows have a constant level and the water is supplied from the network.

The herd of cows (lactating and weaning) for which the welfare assessment was carried out in July 2023 and on the basis of which the animal sample was established, was as follows: 309 lactating cows, 51 cows in advanced gestation and 37 cows in the weaning period. In January 2024, the cow herd had the following structure: 308 lactating cows, 51 cows in advanced pregnancy and 21 cows in the weaning period. The percentage applied to establish the sample was 20% applied to all categories of animals evaluated. The evaluation of the avoidance distance was performed for 10 heads from each group in the stable as recommended in the procedure and in our case, it was performed for 54 animals.

Regarding the evaluation of the herd of cows for foot problems, this was done for all lactating cows and for a percentage of 20% in the case of maternity cows. The herd average in 2022 was 358 cows and 363 heads in 2023.

The welfare assessment was carried out by applying the German assessment system implemented for farmers in order to self-assess the animals and the herd on their own farm. The analysis is based on the collection of information in the stable, on indicators measured on animals but also on data from farm or official registers.

In the case of the herd of milk cows evaluated, the data obtained by applying the animal-based indicators and those registered in the AfiMilk application of the farm, in the official production control and from the Bullfighting Association were processed. The obtained values are annual averages obtained based on the results calculated following the two assessment sessions.

RESULTS AND DISCUSSIONS

The results presented in the tables are the average values obtained from the evaluations by animal category in July 2023 and in January 2024. They are also the presentation and the warning and target values.

Table 1. Evaluation of the avoidance distance and body condition in the herd

INDEX	Qualifying	Lactating cows %	Weaned cows %	Cows in advanced gestation %	Medium value %	Warning value	Target value
Avoidance distance	0	40.85	60,71	65.71	55.76	-	-
	1	42.44	39.28	25.71	35.81	-	-
	2	16.71	0	8.57	8.43	-	-
Body condition	0	73.89	52.68	45.33	57.30		
	1	9.92	0	0.00	3.31	≥ 10%	≤5%
	2	16.19	47.32	54.67	39.39	≥ 12%	≤ 5%

The distance to which the animal accepts human proximity is an indicator of how they are treated and handled by their caretakers (Table 1). Small avoidance distances are associated with a good human-animal relationship. The results in the table show that approximately half of the

animals (44.24%) had an avoidance behavior when approaching them was attempted.

If we refer to the body condition of dairy cows, it can be said that although it is generally a good one, still the percentage of 39.39% of animals that are fat is above the warning value limit of

12%. The most fat females are those in the mammary rest period and in advanced pregnancy, the percentages being 47.32% and respectively 54.67% for these categories. These females are prone to difficult calvings,

metabolic disorders (ketosis, acidosis) and fertility problems, in which case it is recommended to reformulate the rations administered to these categories

Table 2. Evaluation of soiling and injuries

INDEX		Qualifying	Lactating cows	Weaned cows	Cows in advanced gestation %	Medium value %	Warning value	Target value	
Soiling	back leg (superior part)	0	25.48	38,39	14.84	26.23			
		1	74.52	61,61	81.59	72.57	≥ 55%	≤ 10%	
	back leg (inferior part)	0	22.62	44.64	18.96	28.74			
		1	77,38	55.35	77.47	70.07	≥ 40%	≤ 10%	
	udder	0	43.10	73.21	77.20	64.50			
		1	56.90	26.78	19.23	34,31	≥ 20%	≤ 5%	
Injuries to the skin	hock	0	44.37	58.93	74.18	59.16			
		1	55.63	41.07	25.82	40.84			
	knee	0	72.14	81.25	70.05	74.48			
		1	27.86	18.75	29.95	25.52			
	neck	0	99.29	87.5	100.00	95.60			
		1	0.71	12.5	0.00	4.40			
	animals with at least one lesion			57.94	52.68	26,37	45,66	≥ 10%	≤ 4%
	Tail damage		0	93.25	100	96.15	96.47		
1			6.75	0	3.85	3.53	6%	0%	

The degree of soiling of the animals gives clues about the extent to which the walking/access surfaces are cleaned, but also about the ration administered which determines the consistency of the faeces (Table 2). The presence of dirt on the skin has an irritating effect on the skin of animals and can cause the appearance of local infections. In the case of the herd of cows analyzed, the degree of soiling exceeds the alert limit for all three body segments (upper and lower part of the hind limb and udder).

The injuries that appear on the animal's body are the result of the interaction between the animal and various factors related to the maintenance system. Neck damage is usually due to the height of the feed fence not being adapted to the size of the herd. Most injuries occur at the hock, knee and carpal joint, giving clues to the quality of the resting surface (insufficiently soft, deformable, clean and dry), the walking surface or the height of the feeding fence.

If we do an analysis by category of cows, in the case of lactating cows the percentage of animals showing at least one injury to the limbs is very high, 57.94% if we refer to the maximum value of 10% of the warning threshold. The highest frequency is injuries at the hock level, which is 40.84%. For females in advanced gestation, the percentage of those with at least one lesion is lower, at 26.37%, although it is double compared to the warning value. The reduction in the incidence of injuries in this category of cows can be explained by the fact that in the calving pens where the bedding is straw, some of the determining factors are no longer active, which leads to wound healing. The percentage of neck injuries were found in the assessment in July, when some categories of animals were maintained during the summer period, injuries that occurred due to the fact that during feeding, the height of one of the bars of the feeding front is not arranged at the height corresponding to.

Broken, injured or shortened tails can be the result of mechanical impact with brushes or doors, or in the milking parlor but also as a result of the brutal handling of cows by those who care for them. Although it is desirable not to exist in the herd, the percentage of 3.53% of affected animals falls below the warning level of 6%.

The welfare and productive performance of cows is negatively influenced by poor hoof condition. Although it also has genetic determinism (the quality of the horn), the most frequent problems appear due to the influence of

environmental factors (lack of movement, wet and dirty floors, the proliferation of pathogens, etc.) but also if the ongloos are not adjusted in time and professionally. The problems that arise determine the deterioration of the general state of health of the animal, which can lead to its removal from production. The percentage average on the farm is 24.65% of animals with improper condition of the hooves, above the warning value, the most common being the hooves that have a defective shape at the tip (Table 3)

Table 3. Assessment of hoof condition and lameness

INDEX	Qualifying	Lactating cows	Weaned cows	Cows in advanced gestation %	Medium value %	Warning value	Target value
The condition of the hooves	0	71.51	80.35	74.18	75.35		
	1	28.49	19.64	25.82	24.65	≥ 15%	≤ 5%
Lameness	0	78.04	66.96	77.75	74.25		
	1	15.65	26.78	18.41	20.28		
	2	6.31	6.25	3.85	5.47	≥ 3%	0%
total clinically lame animals		21.96	33.03	22.25	25.75	≥ 10%	≤ 5%

The improper condition of the hooves results in visible changes in the gait over time. Lameness is determined by factors such as diseases of the hoof, infections in the lower segment of the limb, but also by the inadequate condition of the walking surfaces, overcrowding and the quality of the resting beds. The warning threshold for the percentage of severely lame animals is a maximum of 3% and is exceeded at least twice in the case of lactating cows and those in udder rest. For the entire herd, the percentage value of 25.75% of mildly and severely lame cows can be considered high. In order to keep this aspect of animal health under control, it is recommended that a monthly assessment of the herd be made in terms of walking behavior and those that affected the walking pattern be noted separately and investigated.

Cows exhibit synchronicity in behavior especially when eating and when resting, so sufficient beds and places at the feeding front must be provided. In addition, the fact that the beds are not optimally designed leads to

decreased rest times which affects the welfare of the cows and can promote the occurrence of hoof and limb diseases, with a negative effect on milk production. The evaluation was carried out 3 hours after feeding, when they feed and the results are presented in Table 4.

The behavior of animals that do not rest after feeding, synchronously with the herd, is determined by the quality of the bedding and the design of the beds. The percentage of 12.16% of animals standing inside the bed reveals that they are not comfortable. Those that are outside the sleeping area are the cows that rest on the floor of the movement or waiting areas as a result of their non-adaptation to the rearing technology. Also, the fluency of movements during lifting from the stand informs about the quality of the bedding in the first place and the comfort provided by the bed. Following the evaluation, 44.58% do not have correct lifting behavior, the target value of this indicator being 50%.

Table 4. Assessment of animal comfort

Index	Description	% Annual average	Warning value	Target value
Use of the bunk	Actively involved in drinking and eating	13.46		
	Fully stretched out on the sleeping area	64.24		
	Lying incompletely on the sleeping area	0		
	Which sit with 2 or 4 legs in the bunk	12,16		
	Located outside the sleeping area	5.07	≤ 1%	≥ 3%
Bunk utilization Index		68.98	≤ 50%	≥ 66%
Cow comfort index - CCI		75.79	≤ 70%	≥ 80%
Lifting Behavior (number of animals that do NOT rise fluently)		44.58	≥ 75%	≤ 50%
Water supply		6 water/100 heads	-	6 water/100 heads

The bunk utilization and cow comfort indices have values of 68.98% and 75.79%, respectively, close to the recommended optimum.

In the evaluation of the health status of the cows, the number of somatic cells and the coefficient of fat and protein are estimated (Table 5). The latter has relevance in terms of feeding

management of animals in the last part of gestation and those in the first days of lactation. A fat-protein (G/P) ratio of < 1.0 is an indication of a rumen fermentation disorder, which may be caused by an insufficient supply of crude fiber (acidosis) and values greater than 1.5 may be indicative of animals suspected of ketosis after calving

Table 5. Herd health and slaughter evaluation

Index	Description	Annual average %	Warning value	Target value
Mastitis	NCS ≤ 100,000 cells/ml milk	59.16%	≤ 50%	≥ 75%
	NCS > 400,000 cells/ml milk	17.85%	≥ 15%	≤ 5%
	Infection rate of HEifers	3.44%	≥ 30%	≤ 15%
G/P ratio in milk	suspected of ketosis (FEQ ≥ 1.5)	17.27%	≤ 15% of cows	
	suspected acidosis (FEQ < 1.0)	30.63%	≥ 15%	≤ 5%
Duration of economic life		32 months	≤ 30 months	≥ 48 months
Outputs from cash	total	36.34%	≥ 40%	≤ 25%
	the first 100 days of lactation	16.5%	≥ 10%	≤ 5%
Mortality of cows	2022 and 2023	1.25%	≥ 5%	≤ 2%

The known factors that contribute to the increase in the incidence of mastitis in the herd are related to the hygiene of the stable, to the technology and hygiene of milking, to the weakening of the defense of the cows' body through metabolic disorders, etc. The percentage of animals with mastitis is 17.85% just above the warning threshold, which requires disease management measures. The infection rate of primiparous females is low, which means that hygiene measures in the maternity ward are adequate. Lactating cows on the farm, the G/P percentage is higher than the recommended warning

thresholds, so 17.27% of the cows can be suspected of subclinical ketosis and 30.63% of acidosis, which again requires measures of feeding management of females in these physiological periods.

The reasons why animals are culled are very different and are often conscious management decisions or unplanned losses. The most common causes of herd exit include: fertility disorders, mammary gland diseases and limb and hoof diseases. The number of animals removed from the herd in 2022 and 2023 was 262 heads with a monthly average of 11 heads

and the percentage approaches the warning value, which represents 36.34% of the average herd. The 1.25% fatality rate is below the recommended 2%.

From an economic point of view, it is not desirable for cows to be slaughtered before 100 days of lactation. From the analysis of the results included in Table 4, it can be seen that the percentage of cow slaughters in this category is high compared to the warning value.

CONCLUSIONS

Ensuring the well-being of animals is an integral part of farm management, all the more so since, under the conditions of sustainability of animal breeding, it has economic implications, cost reduction and easy access to the consumer market.

In the evaluated population, based on the results obtained, it can be concluded:

- following the evaluation of the avoidance distance, only 8.43% showed an avoidance behavior from the approach distance of 2 m;

- with regard to body cleanliness, the warning percentages are exceeded in all cases, which means that additional measures must be taken to clean the stables, but also to rethink the administered ration that influences the consistency of feces:

- the comfort provided by the bedding on which the cows rest, its softness most influences the percentage of animals that have at least one injury, which in the case of the evaluated cows is 45.66%, very high if we compare it with the warning value of 10%;

- in 24.65% of the cows the condition of the hooves is inadequate and 25.75% of the total of the evaluated cows shows clinical signs of lameness;

- regarding the comfort provided by the beds, the use index of bunks has an optimal value of 68.98%, which means that it is provide the comfort during rest;

- the percentage of animals that can compromise the quality of the delivered milk because they have NCS above the maximum allowed is 17.85%, which recommends taking measures to keep the disease under control in the herd;

- the high values of the percentages of fat animals in females in the last period of gestation and those of 17.27% and 30.63%, respectively,

in the case of cows in the first part of lactation and which can be suspected of the subclinical manifestation of metabolic diseases, directs in the sense of taking some management measures of the feeding of females in these physiological stages.

- the post-partum period is a critical one for cows, the percentage of slaughter being higher for females that have not reached the productive maximum of the current lactation.

The management of the rearing of dairy cows on the farm must be aimed at decreasing the incidence of mastitis and podological problems in the herd and also at reducing the percentage of slaughtering of females at the beginning of lactation. It is also very important to re-evaluate the feeding management of cows during the mammary rest period.

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