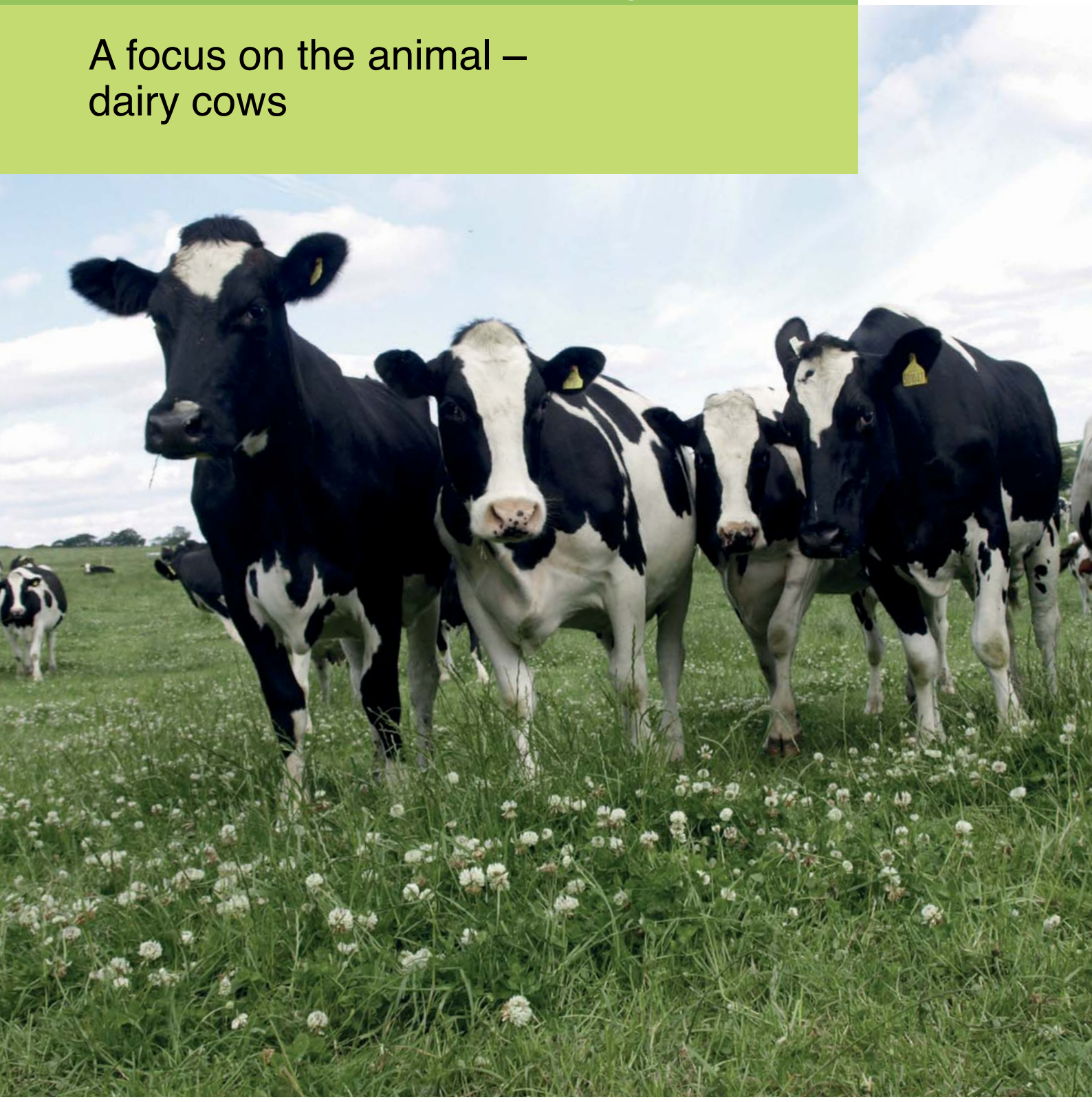
DLG Expert Knowledge Series 381

A focus on the animal – dairy cows



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DLG Expert Knowledge Series 381

A focus on the animal – dairy cows

Aids for the systematic acquisition of behaviour and appearance characteristics

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Participation by members of the DLG committees for

– Animal welfare
– Milk and beef production

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Published by:

DLG e. V.
Competence Center Agriculture
Eschborner Landstraße 122, 60489 Frankfurt am Main, Germany

3rd Edition, as at: 10/2016

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Content

1. Introduction

What is considered animal-friendly? The answer to the question whether a building is animal friendly, must be founded on the biological aspects of the animals: their requirements and their ability to adapt to the environment. If the building does not meet certain requirements of the animals, their ability to adapt can be overstrained. As a result this may lead to pain, suffering or health impairments, as well as an impairment of the animal's well-being.

The requirements of animals and their reactions if their requirements are not met, don't appear as obviously as a "fish out of water". There are, however, scientific methods to recognize their requirements as well as an overstressed adaption effort. With these methods, it can be examined whether the animals can maintain their biological functions, or if stress reactions or diseases occur. It can be checked whether the animals are able to demonstrate their feeding behaviour, or whether serious behavioural variations or irregularities develop. It can also be tested whether physiological or behavioural responses indicate negative emotions such as pain and frustration. In order to receive a complete picture of building-related effects on the animals it is usually necessary to consider several indicators.

The effect of a building can therefore be recognized directly through the respective animal-related indicators. Thus, the overall effect of a building depends on many factors. On the one hand, a fundamental factor here is the equipment in the building, for example, the design and types of water troughs, or the lying and roaming surface quality. On the other hand, management also plays a crucial role. For example, if the wrong animal feed is used, the foundation of any system is incorrect to start off with, or if mistakes are made regarding the treatment of the animals, even a generally optimized building system can have negative effects on the animals. Very often, this can't be detected solely through the building equipment, but rather through actual animal observation: Through their appearance, their behaviour and their health.

This fact sheet aims to provide information regarding the indicators in animal behaviour which you use to identify whether everything is alright, and where building equipment needs to be adjusted, or where your management can be optimized.

2. Observation as a tool for weak point analysis

A crucial basis for the detection of weak points is targeted observation and perception. If two people see the same situation in a dairy cow building, they may interpret it differently based on their professional background, the individual observation angle and especially through their individual experiences. The practicing farmer interprets the situation in the dairy cow house differently to a consultant or the farm's veterinarian. Therefore, a high degree of alignment and practice is required, in order to properly recognize and analyse situations the animal building. As an example, Figure 1 shows a typical situation in the dairy shed that is often interpreted differently. From the housing perspective, there are cows standing in the cubicles (visible). On closer observation (focus) three cows are standing in the cubicles with two legs. This circumstance could, for example, be an indicator of poor neck rail positioning, which is confirmed by this image (observation).

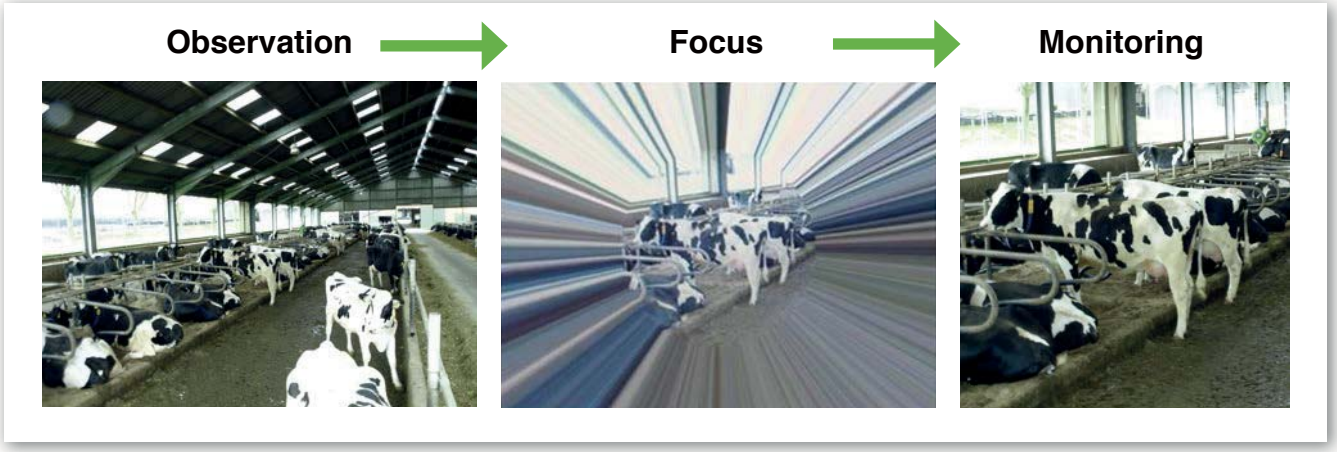

Figure 1: The importance of observation and monitoring (Pelzer, 2012)

The consideration and analysis of animal-related indicators helps to assess the different situations in the shed professionally as well as objectively, and in this context should be integrated into routine management to a greater degree.

The assessment of animal welfare should first and foremost be conducted through the consideration of animal-related indicators. However, certain information from the building environment is also well suited to identify weak points. The number of cubicles and feeding spaces, as well as their dimensions are the basis of the measurable quantitative characteristics of the building environment. Even though the consideration of qualitative characteristics of building equipment is increasingly being focused on, for example, the systematic acquisition and evaluation of recurring chafing or damage to certain parts of the equipment in the building.

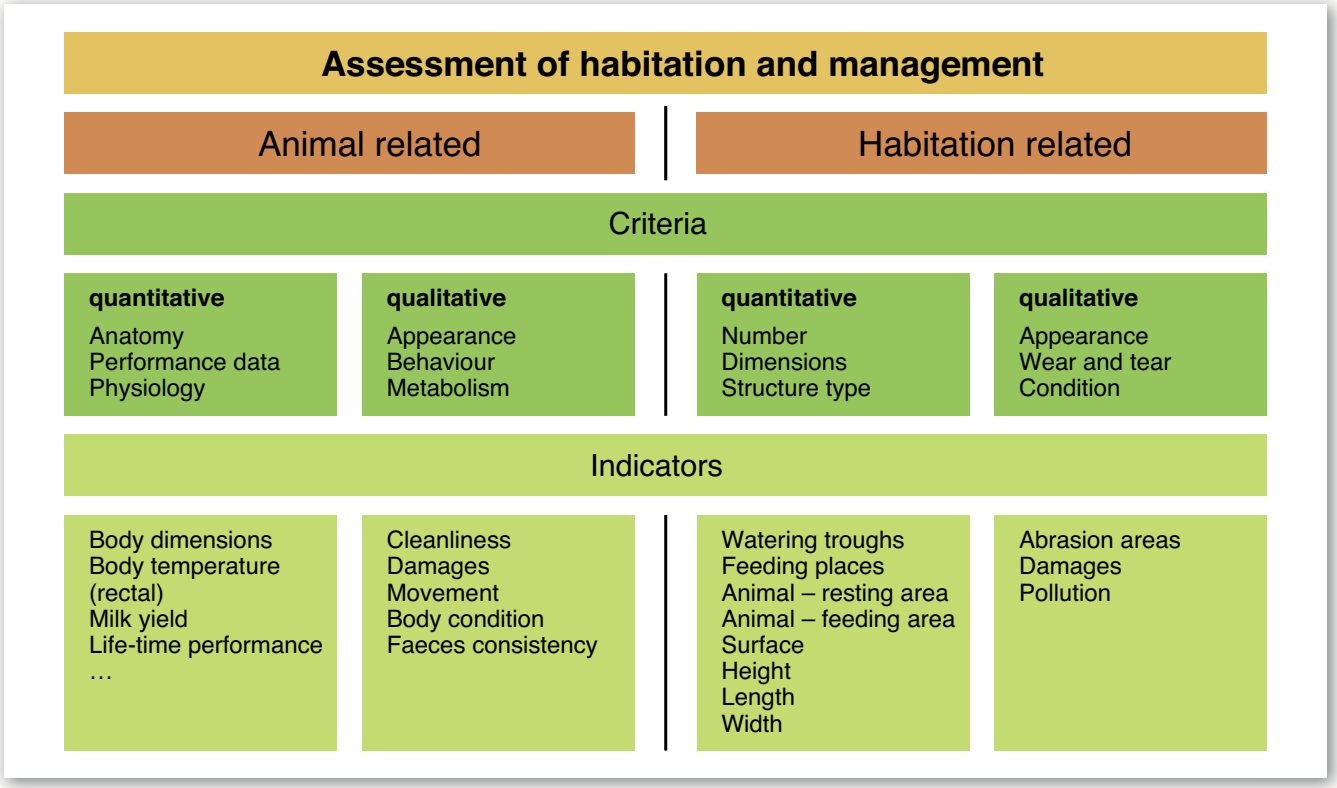

Figure 2: Animal and housing-related features to assess animal welfare (Pelzer, 2015)

The the large number of indicators to be acquired (Figure 2) makes it clear how important it is to analyse these systematically and completely. In addition to the well-known, quantitative, building-related indicators such as the determination of the animal/resting area ratio, or the animal/feeding space ratio, there are also the new, qualitative characteristics that support the objective analysis and technical evaluation of animal welfare in a dairy cow shed. Even if there are still no standards for the systematic acquisition, and no defined target values specified for the evaluation of these characteristics, these indicators will help you gain a more detailed overview regarding the degree of animal welfare in the building environment.

In Figure 3, this becomes evident through the example of the targeted observation of a resting cubicle bracket.

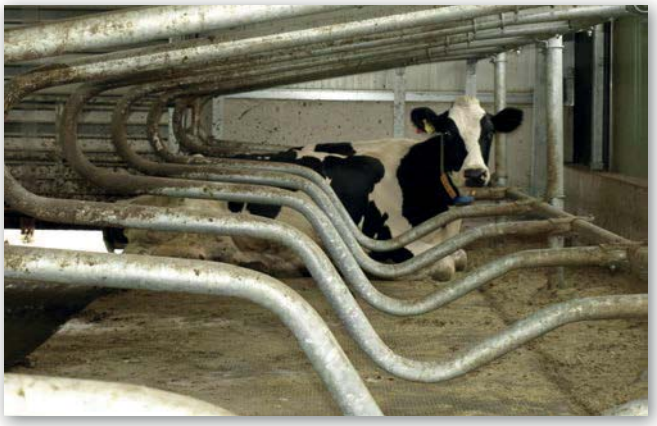

Figure 3: Locally soiled cubicles brackets and surfaces as indicators (PELZER)

On closer inspection of the galvanized cubicle bracket and the shed, it quickly becomes evident that the building is still quite new. The local and recurring soiling on all cubicle brackets makes it clear that the cows are standing in the cubicles, and partially soil the bracket with their wet tails. This information allows the conclusion that the lying behaviour of the cows is impaired in some way.

In the normal situation, a cow lies down less than 30 seconds after completely entering a suitable lying area. In such a case the local soiling of cubicles wouldn't be as easily detected as shown in Figure 3. Against this background, it becomes clear that the cows are standing longer in the cubicles. There can be several causes for this behaviour: the dimensions of the cubicle, the position of the neck rail, or even the structure of the lying surface could be the cause for the delay in lying down. In this case, the rubber mat on the lying surface is inadequately bedded. Cows react to such a combination appropriately by restricting their behaviour. In addition, a relatively high neck rail influences the lying-down process.

Upon further observation of the situation, it becomes noticeable on the lying surface that accrued soiling is visible in addition to the fresh faecal soiling. According to studies, defecation while standing or lying in the cubicle may be a sign of stress. This observation is additionally supported by shortened lying times. The lying surface can be seen as an indicator of the farmer's management effort. The surfaces are clean, the front of the cubicle is lightly covered with saw dust, and damp surfaces at the rear are scatter-coated with some lime. This combination also influences lying behaviour. Cows that lie directly on lime are prone to heavier soiling due to the physical properties of lime.

Figure 4: Feed barrier with significant abrasions (source: Pelzer)

A feed barrier is the focus of a second example. On the rubbed areas of the tubular bars it can be

Figure 5: Closed and dirty ventilation curtains (source: Pelzer)

recognized that the neck width of this barrier does not correspond to the actual neck width of the animals. Even though this doesn't necessarily have any negative effects on the skin of cows, this is still identified as weak point of the building environment, which could have been prevented with the correct selection of feed barrier for the respective breed of cow.

The management of the climate in the shed can also be judged through targeted observations. In Figure 5, it can be seen that the ventilation curtains are closed. At the same time, dirt deposits on the gable wall are clearly visible. An indication that the gable plates are often damp, and thus a high degree of dust and dirt can settle there. Ultimately, this is a sign of inadequate ventilation management. Through consistent opening of ventilation curatins the humidity in the shed would be significantly reduced, thus improving the air quality and building hygiene.

3. Animal observation – error detection – cause determination

For a long time now, behavioural observations of dairy cows have been routinely integrated into herd management, for example, for the oestrus detection. Also, behaviour changes and abnormalities in the appearance are easily perceived. The animals concerned are further examined to investigate the possible causes. While oestrus observation is performed systematically in most cases because of the associated economic benefits, other behavioural traits are usually not subjected to a systematic analysis. However, they can provide valuable information about the health and the welfare of cows.

During the daily interaction with the cows, we regularly observe the animals. We see them when they are feeding, when they enter the cubicles, when they lie down, and during their general movements.

The behavioural characteristics of the following function groups must be taken into account:

- **Resting**
- **Movement**
- **Feed intake**
- **Reproduction**
- **Social relations**
- **Comfort**
- **Excretion**

4. Resting behaviour (cubicle acceptance and surfaces)

In addition to the free movement options and an undisturbed feed intake, cows should be provided with an animal-friendly “lying” function area.

Pasture-fed cows lie around approx. 11 hours a day if there is sufficient food supply. Due to the altered food situation in buildings, cows should lie between 12 and 14 hours per day. Three hours after feeding, the proportion of lying cows should be 50–66 % of the herd. Cubicles should be designed in such a manner that cows can occupy different reclining positions. Lying on their belly and leg stretching to the front and to the side are just as important as the total side-lying or sleeping position.

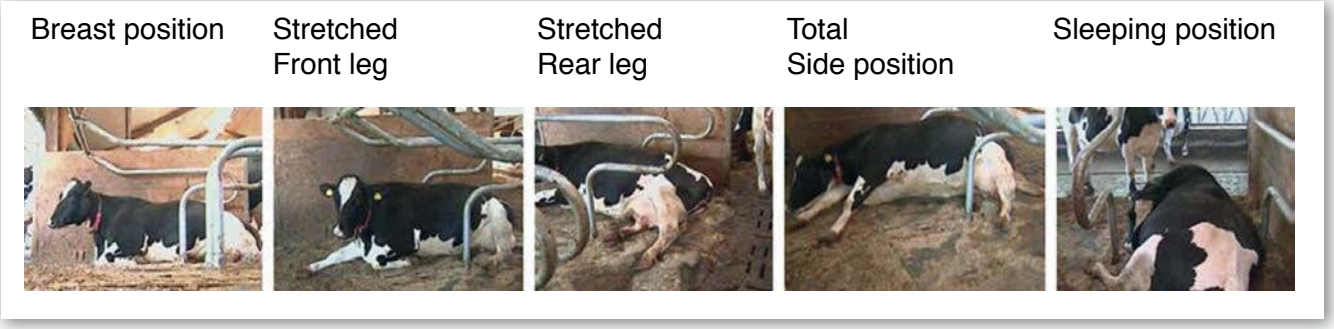

Figure 6: Typical lying position of dairy cows (source: Pelzer, 2004)

Cows should lie down completely on the lying surface. The share of cows standing in cubicles with two or four legs should be less than 20 % of the herd. Long periods of standing in cubicles indicates weak points in cubicle design. If many cows are standing in cubicles with two legs, the positioning of the neck rail should be checked. In many cases, it is mounted too low and thus prevents full access to the cubicle. If the cows are standing for a long time (> 60 seconds after entering) the cubicle with all four legs, this may indicate a poor quality lying surface. Hard, rough lying surfaces and a forward inclination often lead to this behaviour. But wet and soiled lying surfaces, or incorrectly sized or positioned brisket boards adversely impact lying behaviour.

$$\text{Cubicle index} = \frac{\text{Number all correct in the cubicles lying cows}}{\text{Number of all lying + standing cows in the cubicles}}$$

(Target value: > 80 %)

Figure 7: Cubicle index (modified according to N. Cook, 1996)

With the cubicle index according to Cook (Figure 7) it is also possible to evaluate individual cubicle or shed areas. This is especially interesting if different lying surface systems, lying surfaces or cubicle dimensions are installed in a shed.

Table 1: Key indicators of resting behaviour function area
Recommended observation time point: ***3 h after feeding***

Indicator	Yes	No	possible causes
2/3 of the animal herd are in the cubicles	☺	☹	Cubicle design Cubicle management
Lying in different reclining positions	☺	☹	Cubicle dimensions Brisket board design
proper lying (complete and straight)	☺	☹	Cubicle dimensions Brisket board design
Less than 20 % animals standing in the cubicles	☺	☹	Neck rail position Lying surface design Damp, dirty lying surface
Less than 15 % of the cows with degenerative joint injuries/damage	☺	☹	Cubicle design, bedding Cubicle management

☺ = optimal ☹ = sub-optimal

4.1 Detection of weak points

Cows that do not attempt to access the cubicle, often originate from facilities where they were reared on fully slatted floors. One other reasons for this can be permanent overcrowding or strong rank struggles within the herd. Ideally, already heifers should be reared in cubicle systems. Overcrowding of dairy cow housing should generally be avoided. The establishment of a heifer group could be beneficial in reducing stress.

If cows are observed standing in the cubicles (Figure 8), the cubicle dimensions aren't correct for the size of the animals in many cases. Significant design errors during shed construction will create sustained problems within the dairy herd. This can lead to prolonged standing and shortened lying phases. A correction of the neck rail height as well as the installation of suitable cubicle mattresses are absolutely essential.

Figure 8: Rejection of cubicles by cows can be detected through their behaviour (Pelzer)

5. Movement behaviour

Cows should move quickly and confidently in the dairy cow shed with the head held high and a straight back. The running speed is approx. 0.9 m/s at pasture, and the step length should be about 80 cm. Moving about with a lowered head and an insecure look, as well as short steps could indicate potential metabolic problems and pain, as well as weak points in the walking surface design (Figure 10).

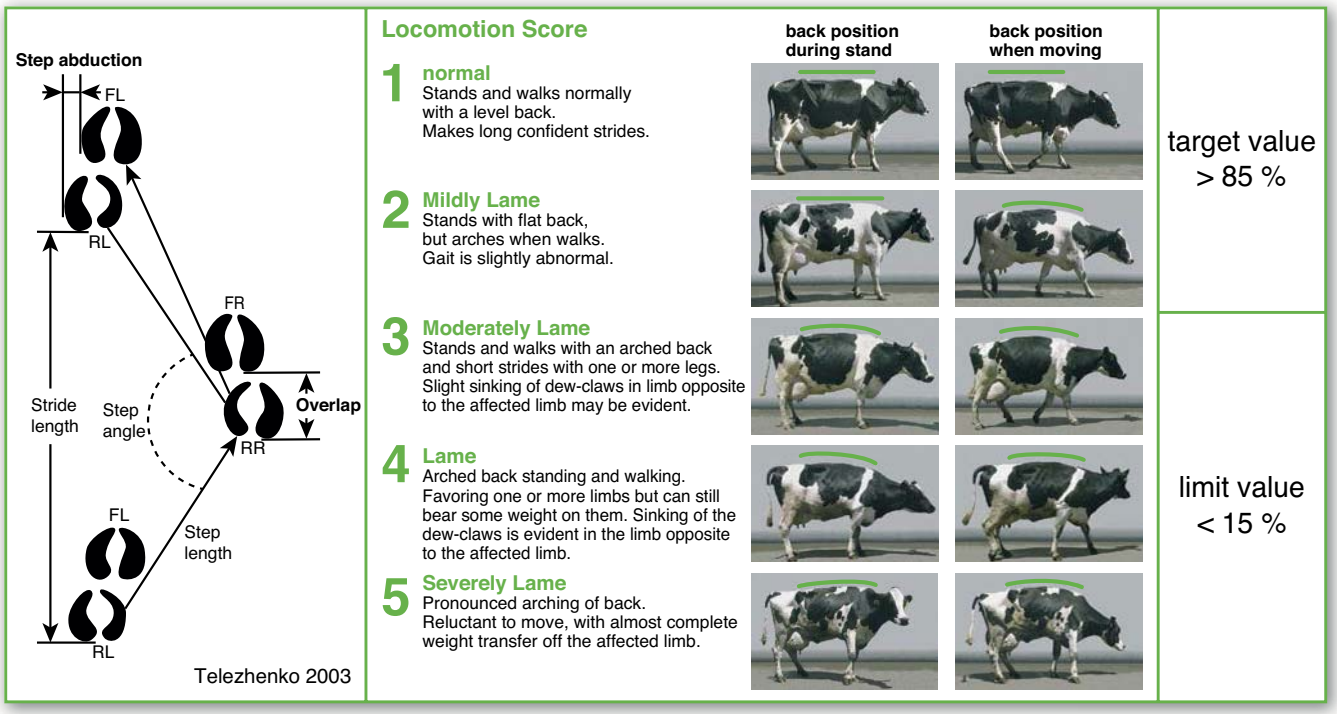

Figure 9: Locomotion scoring (Telezhenko et al., 2003; Zinpro, 2005 and Sprecher et al., 1997; Target and Limit Values according to Dr. Heimberg / Pelzer, LK NRW)

In addition to direct observation, sensors can be used to evaluate cow movement. There are techniques available that are able to measure activity, count steps or document standing and lying times with the help of location sensors..

Table 2: Key indicators of movement behaviour function area
Recommended observation time point: ***When fetching the cows for milking***

Indicator	Yes	No	possible causes
Running speed (quickly forward)	☺	☹	Walking surface design Feeding Space availability
Stride length (long)	☺	☹	Walking surface design Feeding
Back and head form straight line	☺	☹	Walking surface design Feeding
Less than 15 % of the cows demonstrate lameness according to Figure 9	☺	☹	Feeding, soiling, walking surface design Moisture

☺ = optimal ☹ = sub-optimal

5.1 Detection of weak points regarding locomotion

The movement of the cow in Figure 10 shows significant deviations from the normal movement pattern. The curved back line in conjunction with a strongly inclined head position indicates that there are health problems. The six standing cows in the cubicles suggest that there are additional weak points in the design of the cubicles.

It must be considered that for an objective analysis of movement behaviour, at least 10 cows or 10 % of the group must be evaluated.

Figure 10: Stride with hunched back and lowered head and short steps

Figure 11: Cows in the foreground as well as in the background with the desired movement

6. Food intake behaviour

Uninterrupted feed intake is important for cows. Weaknesses in feeding management, stress, displacement and unrest lead to reduced feed intake, and thus adversely affect the metabolism. This has an impact on animal health and ultimately leads to performance depression. During the observation of the food intake behaviour, no conflicts or displacements should be recognizable at the feed barrier.

The cows should eat thier ration, and not throw it onto themselves or behind them. A single “feed launcher” can be found in almost all herds. If the animals demonstrate considerable abnormal feeding behaviours, feed quality and structure should be checked.

For cows who need to queue in a second row due to insufficient feeding space, this means that they must stand for up to 6 hours before they can lie down.

If on days with high ambient temperatures (> 25 °C) an increased number of cows can be observed in the passageways or cubicles, this can be indicative of weak points in the control of the environment within the house.

Table 3: Key indicators in the movement and feed intake behaviour function area
Recommended observation time point: ***Immediately after feeding***

Indicator	Yes	No	possible causes
Feeding spaces are evenly occupied	☺	☹	Animal feeding area proportion Housing climate
"Feed throwing" is observed	☹	☺	Feed structure Feed provision Fly infestation Housing climate Missing scrubbing brushes
Cows waiting in a second row	☹	☺	Animal feeding area proportion Amount of feed
Standing rumination Cows in the passageways Collecting yard Milking parlour	☹	☺	Animal/cubicle ratio Cubicle design Shed climate
At least 50 % of the cows demonstrate rumination while lying down	☺	☹	Feed quality Animal nutrition

☺ = optimal ☹ = sub-optimal

7. Mating and reproduction behaviour

The observation of mating behaviour may not be limited to a specific point in time or a specific duration. Therefore, oestrus observation must be carried out and documented continuously from other indicators and this should be documented separately. For direct oestrus observation 3 x 10 minutes periods must be allocated every day. **In an animal-friendly cow shed, a healthy herd usually exhibits strong heats – with all its facets.** The cows show increased activity, increased interest in other cows and humans. They try to mount other cows, or stand to be mounted themselves. Cows in high-output herds often exhibit reduced mating behaviour. Weak or “silent heats” are often an indication that feeding and buildings are having a negative impact. Thus, a lack of space (roaming areas < 4 m²/cow) and the walking surface significantly influence the locomotion of the herd.

Because the number of cows in heat in a shed or group of cows greatly depends on the herd or group composition, it is not possible to specify target values for this indicator for comparison.

Table 4: Key indicators of mating and oestrus behaviour area
Recommended observation time: ***When fetching the cows for milking***

Indicator	Yes	No	possible causes
Tracking of cows	☺	☹	Walking surface design Walking surface characteristics
increased activity	☺	☹	Walking surface design Walking surface characteristics
spontaneous safe cow mounting behaviour	☺	☹	Slip protection Space availability
Slipping during bulling activity	☹	☺	Slip protection Walking surface design

☺ = optimal ☹ = sub-optimal

8. Social behaviour

Cows are herd animals with pronounced social behaviour and a fixed hierarchy. In addition, the animals need well-structured housing in order to pursue their social activities, with an activity and resting area as well as sufficient space and cubicle numbers. In narrow sheds with bottlenecks for cow movement, cows are repeatedly displaced by animals with a higher rank. Rank clashes increasingly occur during the integration of new members into the herd. If an increased number of disputes can be observed this could also indicate deficiencies in the accessibility of feed, water and cubicle spaces. These displacements lead to stress and anxiety, as well as performance depression and premature culling especially of first-calving heifers. In larger animal groups, the number of rank fights is usually lower.

Table 5: Key indicators of the social behaviour function area
Recommended observation time : ***3h after feeding***

Indicator	Yes	No	possible causes
mutual licking	☺	☹	Shed design Walking surface design
Confrontation apart from herd restructuring (thrusting, driving)	☹	☺	Group size Cubicle management Breed type Bottlenecks in the design of the building
Cubicle displacement Displacement at the water trough Displacement at the feed trough	☹	☺	Animal-resting area ratio Ranking disputes Cubicle design

☺ = optimal ☹ = sub-optimal

9. Comfort behaviour

Comfort behaviour serves to improve the physical well-being of cows, as well as the care of the skin and coat of the animal. Typical comfort behaviour in dairy cows includes licking, rubbing against each other, and the scratching with horns of rear extremities and various places on the body.

For this, special postures are assumed which require the appropriate freedom of movement and surefootedness. The acceptance and usage of technical aids such as electric cow brushes are part of the comfort behaviour.

Figure 12: Mutual licking of two milk cows in the cubicles (source: Pelzer)

Table 6: Key indicators of the comfort behaviour function area
Recommended observation time: ***3h after feeding***

Indicator	Yes	No	possible causes
Standing on three-legs for body cleaning	☺	☹	Walking surface design Slip protection
Scratching of the head and ears with the rear hoofs	☺	☹	Walking surface design Slip protection
Use of the cow brush	☺	☹	Number of brushes Assembly point, position Quality of the bristles

☺ = optimal ☹ = sub-optimal

10. Excretory behaviour

Dairy cows normally excrete faeces and urine standing up. Faults in cubicle design can lead to animals defecating lying down. Against this background, observing this behaviour can indicate weak points in the building and its management. The number of soiled cubicles clearly shows how well cows can adapt to the design of the cubicle and the quality of the lying surface. The number of soiled cubicles between milking times should not be more than 20 %. Frequent excreting prior to lying down or leaving the cubicle usually indicates slippery lying or walking surfaces.

Table 7: Key indicators of the excreting behaviour function area
Recommended observation time: *When fetching the cows for milking*

Indicator	Yes	No	possible causes
Faeces on the lying surface (< 20 %)	☺	☹	Lying surface design Cubicle design
Defecatingwhile lying down	☹	☺	Lying surface design Over-population Hoof problems
Excreting while lying down	☹	☺	Volume Stress Stock being forced to rush

☺ = optimal ☹ = sub-optimal

11. Appearance

The dairy building and management of the herd leave significant clues to any potential problems. When taking a closer look and combining various measurements and observations, you can quickly and accurately identify the causes. Dirty cows in the cubicles can be recognized very quickly, and can be reduced through simple measures. A build up of manure through prolonged intervals between scraping can be easily corrected by increasing scraping frequency. In case of limitedspace in the shed and too few access points, cows are forced to move through pooled slurry and to walk across a slide (Figure 13). This leads to soiling of the lower legs, which significantly increases the risk of infectious hoof diseases such as bale horn rotting and mortellaro.

Figure 13: Soiling of the claws and lower legs through "slurry pooling"

Weak points in building management can be quickly detected with the analysis of soiling, and viable solutions can be formulated with the appropriate causal research. The utilized score is an excerpt from the hygiene score of the project "cows and more, what the cows tell us" from the Landwirtschaftskammer NRW in 2006 (Figure 14).

Soiling on the rear hoof usually originates from contact with soiled lying surfaces. Soiling from faeces, urine or moisture colour the animal's coat dark or yellow. An improvement in the management of cubicle beds through regular, and uniform bedding introduction will help to keep cubicles beds dry and will. This should improve the cleanliness of animals.

	High-score dairy cows					
	1	2	3	4	5	6
						
	clean	Slightly discoloured, occasional splashes	severely discoloured, Stains, many splashes	Adhesions of droppings	starting clod formation	strong clod formation
	Self review in the cubicle house of at least 20 cows (tally sheet)					
	1	2	3	4	5	6
Possible causes	Good cubicle management Dry lying surfaces Animal-friendly dimensions	Wet lying surfaces	Management High lime content	Cubicle management	Lack of bedding Too high lime content Cubicle design	Slats Young cattle reared on fully slatted systems Cubicle design

Figure 14: Hygiene score dairy cows (Pelzer, 2006)

12. Feeding of the “close-up” dry cow

The feeding of dairy cows should also be accompanied by careful management and regular observation of the animals.

Rumen fill score can be used for the individual, animal related control of feed intake assessment. This can be made through an evaluation of rumen fill using the scores 1 – 5 (table 8).

Scores 1 and 2 suggest poor feed intake, that is often associated with ketotic metabolic layers, and indicate the need for special care or treatment of individual animals. A higher proportion of cows with scores 1 and 2 point to fundamental shortcomings in the feed management (such as too short feeding time, overcrowding, high animal/feed space ratio, too little feed, improper ration composition, or inadequate feed quality).

Score 3 indicates high feed intake and a good rate of passage through the animal. This isdesirable in the “close-up” period and in the high-performance phase.

Scores 4 and 5 are more typical of late lactation cows and in the recently dried off group. High scores for freshly lactating cows could also have been observed with gas development in the rumen, and then this could present a problem.

Table 8: The evaluation scheme for the assessment of the rumen fill (according to ZAAIJER and others 2001)

Score	Rumen depression evaluation (standing on the left behind the cow)
1	Rumen depression more than a “hand-wide” deep, almost rectangular sunken behind the ribs, skin tapered under the transverse protrusions.
2	Rumen depression still a “hand-wide” deep, collapsed in the form of a triangle, skin still tapered under the transverse protrusions.
3	Rumen depression is still visible, skin above the transverse protrusions runs “hand-wide” deep downward and then turns towards the outside.
4	Indentation of the rumen depression is hardly or no longer visible, the skin above the transverse protrusions turns directly to the outside from there.
5	Transverse protrusions not visible through filling of the rumen depression, abdominal skin is stretched around, no transition visible from the flank to the rib.

Table 9: Daily animal checks during the first 10 days after calving (Pelzer)

Criterion	Result	
	Positive	Negative
Body temperature (rectal)	37.5 to 39.0 °C	> 39.5 °C
Ears, body surface area	warm	cold
Fur coat	shiny, smooth	blunt, scrubby
Eyes	shiny, smooth	sunken, turbid
Behaviour	lively, secure	apathetic, insecure
Discharge of the afterbirth	occurred	Afterbirth retention
Vaginal discharge	without or physiologically	purulent, smelly
Rumen fill (grade)	good (3)	bad (1, 2), bloated (5)
Ruminal activity	≥ 2 x per minute	< 1 x per minute

The counting of ruminations when observing cows is a good initial measure to detect acidotic metabolism at an early stage. More than 55 % of lying cows should be observed while ruminating with 50 to 60 chewing strokes per bite.

It is advisable to measure the body temperature at least once a day, a week or 10 days after calving. The normal body temperature varies between 37.5 °C and 39 °C (measured rectally). A rise in temperature above 39.5 °C is indicative of fever, and requires treatment by a veterinarian. The status of the cow and, where appropriate, the treatment requirement should also be tested based on other well-being criteria (table 9).

These checks should at least be conducted on a daily basis and perhaps more regularly in the first week after calving, together with body temperature measurement. High proportions of conspicuous animals indicate fundamental feeding mistakes.

13. Appendix

Checklist dairy cows I

Indicator	Observation time*	Yes	No	Remarks
Resting behaviour function area				
2/3 of an animal herd are in the cubicles	2	☺	☹	
Lying in different reclining positions	2	☺	☹	
proper lying (complete and straight)	2	☺	☹	
Less than 20 % animals standing in the cubicles	2	☺	☹	
Less than 15 % of the cows with degenerative joint problems	1–4	☺	☹	
Movement behaviour function area				
Walking speed (strongly directed forward)	3	☺	☹	
Stride length (long)	3	☺	☹	
Back and head form straight line	3	☺	☹	
Less than 15 % of the cows demonstrate lameness	3	☺	☹	
Nutrition and fd intake behaviour function area				
Feeding spaces are evenly occupied	1	☺	☹	
Feed throwing is observed	1	☹	☺	
waiting cows in a second row at the feed barrier	1	☹	☺	
Standing rumination	2	☹	☺	
Rumination while lying down (> 50 %)	2	☺	☹	

* Recommended observation time:
1 = after feed provision; 2 = 3 h after feed provision; 3 = when fetching the cows for milking; 4 = during milking
☺ = optimal ☹ = sub-optimal

Checklist dairy cows II

Indicator	Observation time*	Yes	No	Remarks
Mating and reproduction behaviour function area				
Tracking of cows	2	☺	☹	
increased activity	2	☺	☹	
spontaneous mounting	2	☺	☹	
Slipping during mating activities	2	☹	☺	
Social behaviour function area				
mutual licking	2	☺	☹	
Disputes beyond herd restructuring (thrusting, driving)	2	☹	☺	
Displacement from cubicles	2	☹	☺	
Comfort behaviour function area				
Standing on three-legs for body cleaning	2	☺	☹	
Scratching of the head and ears with the rear hoofs	2	☺	☹	
Acceptance of the cow brush	2	☺	☹	
Excretory behaviour function area				
Faeces on the cubicle surface (< 20 %)	3	☺	☹	
Defecating while lying down	3	☹	☺	
Defecating while lying down	4	☹	☺	

* Recommended observation time:
1 = after feed provision; 2 = 3 h after feed provision; 3 = when fetching the cows for milking; 4 = during milking
☺ = optimal ☹ = sub-optimal

Checklist dairy cows III

	High-score dairy cows					
	1	2	3	4	5	6
						
	clean	Slightly discoloured, occasionally splashes	severely discoloured, Stains, many splashes	Adhesion of droppings	starting clod formation	strong clod formation
	Self review in the cubicle house of at least 20 cows (tally sheet)					
	1 ☺	2 ☺	3 😐	4 😐	5 ☹	6 ☹
Possible causes	Good cubicle management Dry lying surfaces Animal-friend-ly dimensions	Wet lying surfaces	Management High lime content	Cubicle management	Lack of bedding Too high lime content Cubicle design	Slats Young cattle reared on fully slatted systems Cubicle design

☺ = optimal 😐 = neutral ☹ = sub-optimal

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