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# Keeping cattle outdoors year-round

## Aspects of animal welfare and environmental acceptability

*Keeping suckler cows outdoors year-round is a cost-effective system widely applied in the northeast and mountainous regions. Because winter housing is not used the cows' own weather-hardiness must be supported by the right management. Ways in which cattle help heat retention in winter include reduced movement and increased presence around the feeding point which in turn leads to damaged pasture and high spatial dung deposition.*

*Consumer protection measures have developed systems with regular assessment of animal welfare conditions and environmental acceptability.*

A reduction in dairy herds means that especially in disadvantaged areas there is spare feed capacity. This could be used for suckler cow enterprises which also help pasture upkeep and avoids areas going to brush. Because suckler returns are not viable cost-reducing production systems have to be developed as well as ways of marketing the production. Cost reduction can include dispensing with inwintering [11, 24]. This approach gives 10 to 15% cost advantages so that there's hardly any alternative to it should EU support fall-off. This has been recognised especially by suckler herd managers in the northeast and mountainous regions in Germany where the proportion of suckler herds kept outside is 40% and 15% of total sucklers respectively. Under similar location conditions outdoor keeping of sucklers in the USA and New Zealand has a long tradition and there all sucklers are kept outdoors.

### Animal welfare

Year round outdoor management means no buildings for the cows which are run on permanent or arable pasture without artificial shelter (*fig. 1*). This can lead to substantial heat loss by animals especially during wet-cold windy weather in spring, autumn and winter. However cattle cope with the cold with a large number of reactions which means they can be very cold-tolerant [6, 7]. Included are the growth of a winter coat, seeking out sheltered areas and reduction of activity to cut heat-loss. Should the latter exceed body heat production then the cows can eat more. In [9] a 10% to 15% higher feed intake is reported under cold stress.

Animal welfare based management includes the right preparation of the stock for the winter period, the support of adaptation

*Fig. 1: With the right management year-round cattle production outdoors is acceptable on a welfare basis – even for older suckler calves.*

reactions through offering sheltered areas and regular monitoring of performance and health. Preparation includes a health check with only healthy cows being outwintered, e.g. cows with insufficient hairing die to ectoparasite problems must remain indoors and additionally winter calving must be avoided due to the lower cold tolerance of newborn calves. Further, time must be allowed for animals getting used to their outwintering area because it has been observed [5] that cows which have spend several winters outside visit sheltered areas much more frequently compared with inexperienced ones. Alongside offering winter feed according to requirements body energy reserves are of great importance at the beginning of the winter [19] These can be mobilised to help with warmth production and thus the maintenance of the body core temperature during cold stress.

In every case a littered and sheltered lying area should be on offer on the outwintering area so that several body heat reduction factors can be avoided at the same time. The re-

*Table 1: Behavioural aspects in relation to weather (proportion of cows in %) [23]*

| Behaviour | Weather | | |
|---|---|---|---|
| | Dry-warm[1] % | Wet-cold[1] % | Dry-cold[1] % |
| Lying on non-insulated areas | 12 | 0 | 0 |
| Seeking littered areas | 1 | 10 | 26 |
| Seeking overhead shelter | 5 | 24 | 22 |
| Seeking the area >80 m from the feeding point | 80 | 50 | 26 |

[1] dry-warm (>6°C), wet-cold (-6°C, precipitation), dry-cold (<-6°C)

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## Literature

Literature details are available under LT 02429 via Internet at http://www.landwirtschaftsverlag.com/landtech/local/fliteratur.htm

quirement for a littered lying area can be justified through behavioural studies. Observations have shown that cows avoid contact with cold ground (*table 1*) when there's no littered area available. In wet-cold conditions this can lead to disturbed lying behaviour with cows becoming exhausted, cudding is then affected leading to metabolic irregularities. The lying area must also be wind-sheltered because the heat reducing cold-factor of wind can lead to substantial stress, especially in wet-cold conditions.

Rain shelter is not required in year-round outdoor suckler systems – as shown by trials in Solling, a mountain region with 850 to 900 mm annual precipitation [14]. Here, sucklers have been kept outdoors year-round for 10 years and there has been no weather situation where cows' body core temperature has not been maintained. Additionally their performance has been equal to inwintered cows. Notable was the better health of the outdoor cows with no incidence of airway diseases or ectoparasites [25]. On certain sites magnesium efficiency can occur with the associated rise in autumn tetanus risk where additional stresses occur in autumn [13, 14, 17]. This can be combated with magnesium licks. The Solling investigation which has continued since 1992/93 has shown that beef cattle are also suitable for outwintering and that this cost-efficient production system can be combined with the rearing of well-fleshed slaughter carcases.

*Table 2: Assessment points and target values for animal fair and eco-friendly range keeping*

| Evaluation point | Target factors |
|---|---|
| *Preparing the cows* | |
| Rearing | Free range or outside climate conditions |
| Pregnancy status | Avoidance of winter calving |
| Coat | Freedom from ecto-parasites |
| Fundamentals | Healthy hoofs (evaluation of gait) |
| Condition | Sufficient, body reserves, high feed intake |
| *Support for adaptation* | |
| Lying area | Littered, as dry as possible, wind-protected |
| Drinkers | Frost protection, sufficient capacity |
| Feeding equipment | Rain protection, sufficient feeding space |
| *Performance and health* | |
| Fertility rating | Reproduction rating near 100 % |
| Mineral supply | Optimum blood rating |
| Animal health | Low disease incidence |
| *Environmental acceptability – location suitability* | |
| Ground type | "Ranker", „rendzinen", sand, brown earth |
| Texture (soil type, part. size) | High sand proportion |
| Relief | Flat areas |
| *Environmental acceptability – form of winter area* | |
| Feeding | • Feeding point and approach, solid surface or littered<br>• Suiting feeding equipment<br>• Decentralised feed supply<br>• Feed „on the stalk" |
| Drinkers | Firm surface for drinking point |
| Stocking rate | ≤1 Large animal unit/ha |

### Environmental acceptability

With wet-cold conditions in early spring, late autumn and in winter, extensive damage to the grass sole in pasture can be observed. This is due to the cows spending around 70% of their time at the feeding point [14]. Reason is the need to reduce movement as shown in table 1 and the increased feed requirement under cold stress. As well as grass damage, soil compaction can also occur, although not to the same extent everywhere. Thus level areas with high sand content are more suitable for outwintering [22] in that the regeneration capacity of the grass sole and soil surface is superior to that of loam and clay soils. However the levels of Nr. moving into the undersurface soil can be substantial where high amounts of dung fall on specific points [21, 15, 26]. This can be observed at the feeding point where the animals spend considerable time. [20] describes the enrichment in the soil from ammonia and potassium and [18] found Nr. contents ($N_{min}$) of up to 900 kgN/ha at the feeding point with a high ammonia proportion. It can be assumed that the $NH_3$ and $NO_x$ loss potential at the feeding points is very high where excrement amounts are high.

An environmentally acceptable approach where there is a central feeding point involves littering the area surface. [12] observed that with a litter amount of 3.5 kg/large animal unit and day 50% of excrement Nr. could be bound-up. [16] advises 15 to 20 kg litter per animal unit and day. Another system is based on regular movement of the feeding equipment. The movement interval must be judged according to soil Nr. content and thus herd size. This system also assumes drivability of the area and its practicability is therefore limited. Drivability is also important for a third system where the animals are fed on a decentral basis with distribution wagons distributing feed in different areas. Regarded as promising is the offering of feed „on the stalk", normally used with large herds. This involves running herds on undersown or drilled stubble after harvest in late summer, a system that can only be extended for winter feed where winter-hardy varieties such as PRG or tall fescue are sown [10, 3, 4]. Supplementary winter feed with conserved forage is minimal where the grown by beginning of winter represents around 2.2 t dm per animal unit and ha. This means feed costs can be saved. Additionally, this system offers better dung distribution because central feeding would only occur on a few days.

### Assessment concept regarding welfare and environment acceptability

The publication of guidelines [2] was an important step in the creation of uniform criteria for welfare-acceptable outdoor cattle systems. From the consumer protection aspect the guidelines should be extended to include the total management system. As part of precautionary consumer protection the target should be the achievement of a high measure of security within the production process (quality assurance). This requires the definition and regular assessment of areas within the management system where lack of attention could lead to an increased risk of errors. In *table 2* such areas or assessment points are defined and identified according to importance.