


### Scenario 1 - Current dairy production

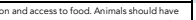
Welfare principles	Welfare criteria							1st round score	90% certain lower bound	90% certain upper bound	2nd round score	90% certain lower bound	90% certain upper bound	
Good feeding	1	Provision and access to food. Animals should have appropriate access to the quantity and quality of appropriate foodstuffs for health and wellbeing.	55	40	80	55	40	80	80	Genetic potential for milk production can create problems in providing appropriate nutrition for lactating cows. Negative energy balance suggests cows don't have access to appropriate foodstuffs, but higher concentrate to forage ratios can create rumen health problems. Lameness during lactation might also make animals reluctant to stand and feed, exacerbating hunger, negative energy balance and rumen health issues. Artificially-reared calves may get inadequate access to amounts of milk. Abrupt changes to (e.g. at drying off) could cause hunger. Problems with access to feed not widely reported at other ages.				
	2	Provision and access to water. Animals should have appropriate access to the quantity and quality of water for health and wellbeing.	65	55	85	65	55	85	85	Access to clean water should be provided in houses and at pasture - lameness may impede ability of cows to access this freely. Lactating cows have high demand for water. Survey work in other countries suggests that levels of provision for calves and for lactating cows are not always sufficient. Bowl drinkers and troughs may also be subject to hygiene problems.				
Good housing	2	Animals should have comfort when resting.	50	40	70	50	40	70	70	Cubicles limit the resting postures that can be adopted and this is exacerbated when there is poor design. Lameness may make it more difficult for cows to lie down and get up within cubicles. Sufficient bedding material might not always be provided to ensure comfort, including for younger stock. Hygiene can also be an issue in lying areas. Space and comfort increased when cows can lie at pasture or in straw-bedded barns.				
	4	Animals should have thermal comfort being neither too hot nor too cold.	65	50	80	65	50	80	80	Cold stress possible in cows at pasture and with young stock (kept in a variety of conditions), and heat stress also possible in all ages in housing and at pasture. Lameness could affect ability of cows to move to shelter/better bedding.				
	5	Animals should have sufficient space to move freely.	60	40	80	60	40	80	80	There is not the space to move completely freely in houses, and the level of restriction will depend on the housing design (amount of loafing area, level of passageways between dead-ends). Similarly, the ability of cows to freely choose a lying area is constrained in cubicle houses. The ability to move freely is greater in straw barns and greater again at pasture. Individually housed calves may have small space allowances.				
Good health	6	Animals should be free from injuries and disorders (e.g. skin conditions, lameness, bone fractures etc.).	40	30	60	40	30	60	60	30% clinical lameness, and cows may still experience pain at lower gait scores (a score of 1 still means imperfect mobility) (pain associated with lameness is being considered here rather than in 8). Levels of hock and other leg lesions due to injury may also be relatively high, and cows may also have digital dermatitis lesions (not necessarily always evident in the gait score). These problems can also be shown in youngstock.				
	7	Animals should be free from disease, including metabolic conditions, with high standards of health care and hygiene.	35	20	50	35	20	50	50	Adult dairy cows suffer metabolic conditions associated with high levels of productivity (e.g. acidosis, ketosis, milk fever), and also conditions such as mastitis and metritis. Metabolic conditions may be exacerbated by lameness (affecting feed intake and negative energy balance). Increased lying due to lameness may also increase mastitis. Call respiratory and enteric diseases are common problems and can be related to poor hygiene standards. Pain associated with these conditions is considered here rather than in 8 below.				
	8	Animals should not suffer pain - for example as a result of poor management, handling, surgical or other procedures, slaughter etc.	60	40	80	60	40	80	80	Pain associated with aggressive handling to encourage animals into the parlour, into crushes or when moving them for other reasons is still possible on farms. Calves also subjected to procedures such as disbudding and tagging. Abrupt cessation of milking at dry off may also be associated with pain. Lameness associated with hyperaesthesia and so any potentially painful procedure for dairy cows may be exacerbated with increased lameness.				
Appropriate behaviour	9	Animals should be able to express normal, non-harmful social behaviours (such as grooming and social bonding).	30	20	40	30	20	40	40	Separation of cows and calves means that they are not able to form normal social bonds, and this has impacts at both ages. It has also replaced natural mating in many cases. Single housing of calves will also limit ability to express normal social behaviours. At other stages of production cows/calves/heifers are generally group housed with ability to display some normal social behaviour, however they may also be subjected to changes in social group (addition of heifers to groups of older cows may also cause stress). Ability to display normal social behaviour may be affected by lameness.				
	10	Animals should be able to express other normal behaviours (e.g. foraging, exploring).	40	30	50	40	30	50	50	Cows cannot express natural grazing behaviour indoors (even if presented with grass in zero grazing systems), and also have limited opportunities for exploration. They also may not be able to feed synchronously and show peaks of the behaviour at preferred periods of the day. Ability to perform other behaviour may be limited by lameness. Youngstock also have limited abilities to forage or explore during winter housing periods.				
	11	Animals should be handled well with positive and not negative animal-human relationships.	65	50	70	65	50	70	70	Pain associated with poor handling accounted for in 8 above, but stress effects accounted for here. Use of vehicles and dogs to move animals may also cause stress. Problems with poor human animal relationships may be most acute with first calving heifers, unused to high levels of contact with people. Move to automated milking systems could potentially be associated with positive effects on human-animal relationship (fostering different types of survey work in other countries). Slow movement associated with lameness may lead to poorer handling.				
	12	Additional aspects not already adequately covered above in relation to the balance between positive and negative affective states for animals.												

### Scenario 2 - Dairy production with only 5% lameness score 2/3

### Score sheet

Name of scorer: Expert 6

## Comments

Welfare principles	Welfare criteria	1st round score	90% certain lower bound	90% certain upper bound	2nd round score	90% certain lower bound	90% certain upper bound	
								
Good feeding	1 Provision and access to food. Animals should have appropriate access to the quantity and quality of appropriate foodstuffs for health and wellbeing.	65	50	80	65	50	80	80 Access to feed likely to be increased with reduced lameness
	2 Provision and access to water. Animals should have appropriate access to the quantity and quality of water for health and wellbeing.	70	60	85	70	60	85	85 As above
Good housing	3 Animals should have comfort when resting.	60	40	70	60	40	70	70 Transition to resting posture likely to be easier with less lameness
	4 Animals should have thermal comfort being neither too hot nor too cold.	70	55	85	70	55	85	85 Being able to perform thermoregulatory behaviour may be easier with less lameness
	5 Animals should have sufficient space to move freely.	60	40	80	60	40	80	80 Space would be the same in both systems
Good health	6 Animals should be free from injuries and disorders (e.g. skin conditions, lameness, bone fractures etc.).	60	40	80	60	40	80	80 Adoption of management practices to reduce lameness significantly would likely also have positive repercussions at other stages (e.g. for youngstock reared on that farm)
	7 Animals should be free from disease, including metabolic conditions, with high standards of health care and hygiene.	45	30	60	45	30	60	60 Better ability to access feed through reduced lameness may help address some metabolic conditions, and reduced lying may help with mastitis
	8 Animals should not suffer pain - for example as a result of poor management, handling, surgical or other procedures, slaughter etc.	70	50	80	70	50	80	80 Reduced lameness would reduce impact of other painful conditions in adult dairy cows.
	9 Animals should be able to express normal, non-harmful social behaviours (such as grooming and social bonding).	40	30	50	40	30	50	50 Ability to display some normal social behaviours may be improved by reduced levels of lameness. Other aspects not possible due to the system.
Appropriate behaviour	10 Animals should be able to express other normal behaviours (e.g. foraging, exploring).	50	40	60	50	40	60	60 Ability to perform foraging and exploration (where suitable substrates are available) likely to be improved by reduced lameness.
	11 Animals should be handled well with positive and not negative animal-human relationships.	70	50	90	70	50	90	90 Less slow movement (due to lameness) may improve handling.
	12 Additional aspects not already adequately covered above in relation to the balance between positive and negative affective states for animals.							