
Methods of livestock
welfare assessment

Around the world, assessment systems have been developed to verify or check welfare levels on certain farms, or methods to help the farmer identify if there are reserves and problems on his farm and how to prevent or address them. Examples of welfare evaluation systems that focus on housing and management systems are given in the Austrian Animal Needs Index and Freedom Food Schemes - R.S.P.C.A- based on the five freedoms - gives a systematic picture of the resources and entries made on the farm, but does not include any direct indicator relating to animals and husbandry.

Methods of assessment of farm animal welfare at herd level (Johnsen et al., 2001)

ANI	Austria
TGI 200	Germany
Welfare assessment in "Ethical counting"	Denmark
The impact of housing systems in dairy cattle	Switzerland
On-farm assessment of dairy cows' welfare	France
Decision support system to assess the welfare status in farm animals	The Netherlands
Evaluation and certification of housing systems for horses	Switzerland
Dispensation programme for battarey cages	Sweden

An overview of welfare assessment methods at the turn of the century.

The 'Animal Needs Index', (ANI) was developed in Austria during the 1980s. It was later reworked in Germany, which produced a German version, TGI 200. Both systems assess the impact of the housing system on animal welfare. ANI was developed as a mean of certifying the level of animal welfare on farms. Today it is used in monitoring of **organic husbandry** in Austria and in the implementation of animal welfare legislation in two federal provinces of Austria. In ANI points are assigned to five areas of the housing system and management:

1)possibility of movement,
2)social contact,
3)quality of floor,
4)climate, and
5)stockman care.

Parameters relevant to feeding are not included in TGI 35L, because it is assumed that there is no economic motivation in not feeding animals properly.

Animal Needs Index-35-L(TGI)

Helmut Bartussek (1985)

The ANI is based on 5 aspects of the animal environment and the interaction of their different factors and after evaluation, it expresses the level of animal welfare with a numerical value. The ANI has been developed to assess welfare primarily in dairy cows, fattening cattle, laying hens and fattening pigs. A trained worker evaluated the welfare in the stable according to each parameter within 1 hour. The maximum score obtained was 45.5 and for newly established organic farms in Austria the limit was at least 24 points.

Interaction of environmental factors and aspects according to ANI

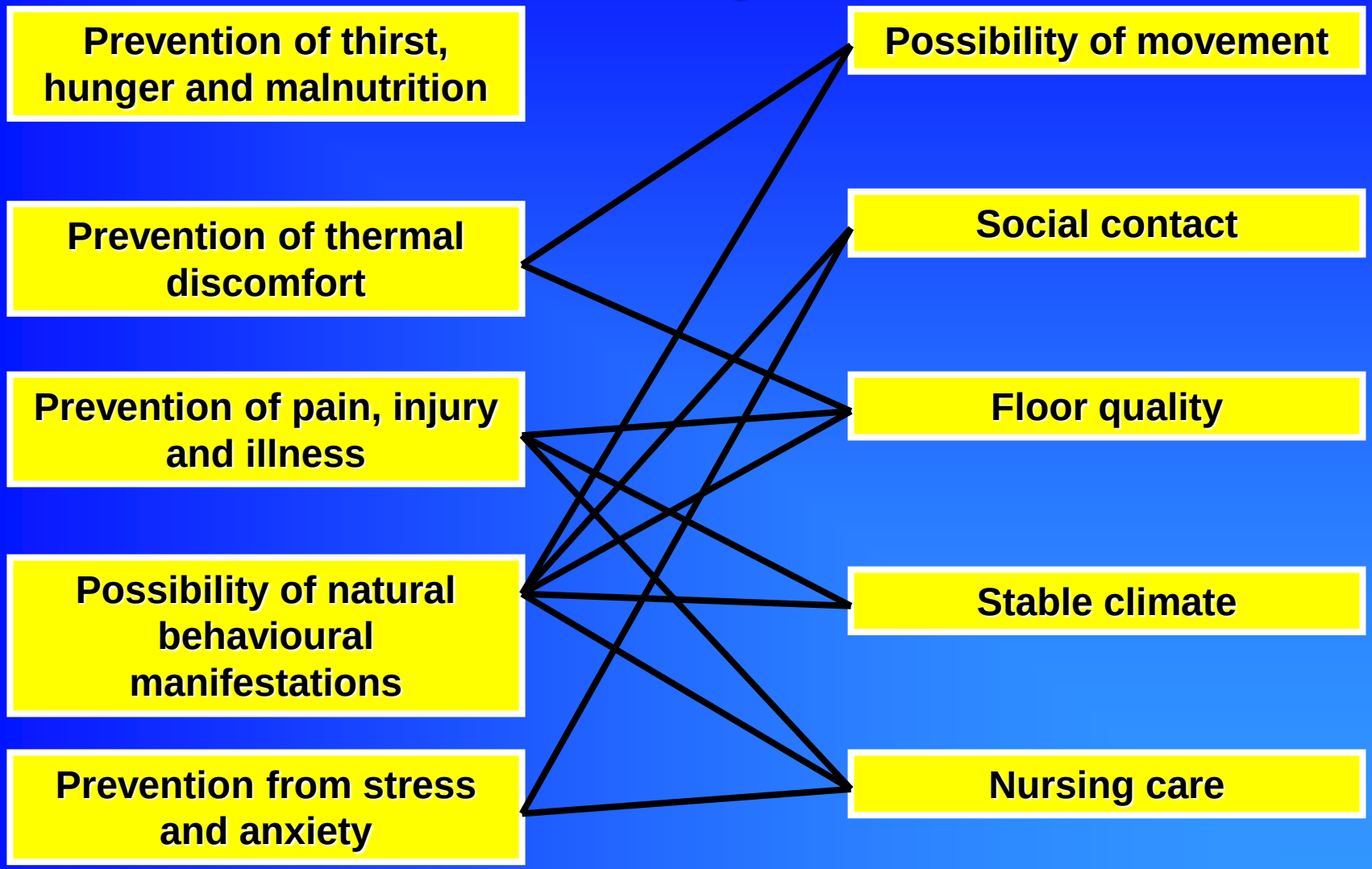


Table 1. Structure of ANI (TGI-35 L/1996) for young cattle, beef cattle and cows

Fields of influence to be evaluated	Ethologic and hygienic arguments	Criteria to be evaluated within fields of influence	Points (min.–max.)
I. Possibility of	Sufficient movement	Area per animal, m^2/500 kg	0–3.0
mobility	Normal behaviour at	Rising, lying down in loose h.	0–3.0
	resting, lying, rising,	Tied housing	0–2.0
	Five "freedoms" according to the	Outside exercise	0–3.0
	Brambell Report, (Brambell, 1965)	Alpine pasture/pasture	0–1.5
II. Social contact	Agricultural animals are social	Area per animal, m^2/500 kg	0–3.0
	species	Social structure of herd	−0.5–2.0
	Essential needs for	integration of followers	−0.5–1.0
	species-specific social	Outside exercise	0–2.5
	contact and behaviour	Alpine pasture/pasture	0–1.5
III. Quality of flooring		Resilience of lying area	−0.5–2.5
	Permanent contact,		
	Important effects on	Cleanliness of lying area	−0.5–1.0
	behaviour,	Slip resistance of lying area	−0.5–1.0
	hygiene,	Floor condition, moving area	−0.5–1.0
	health and	Floor condition, exercise area	−0.5–1.5
	well-being	Alpine pasture/pasture	0–1.0
IV. Stable climate	Permanent contact,	Light	−0.5–2.0
(light, ventilation, noise)	Important effects on	Air quality	−0.5–1.5
	behaviour,	Draughts within lying area	−0.5–1.0
	hygiene,	Technical noise	−0.5–1.0
	health and	Days outside/year	0–2.0
	well-being	Hours outside/day	0–2.0
V. Care of stockman	Correct and attentive		−0.5–1.0
		Cleanliness of housing	
(indicators)	care/handling of animals	State of technical equipment	−0.5–1.0
	has a balancing and	State of coat of hair	−0.5–1.0
	compensating effect on	Cleanliness of animals	−0.5–0.5
	behaviour, hygiene,	State of hooves	−0.5–1.5
	health and	Technopathies[a]	−0.5–1.5
	well-being	Animal health	−0.5–1.5
Sum of points	(max. absolute−36.5)	−ANI-value−	−9.0–45.5[b]

Why were these criteria chosen as an appropriate welfare indicators?

- **Possibility of movement**

  Movement is **completely natural** for farm animals. Adequate opportunity to move and a sufficiently large space is also necessary for the expression of other ethological functions - social contacts, games of the young, exploratory behaviour. Lack of it also causes health problems such as degenerative changes in the musculoskeletal system (muscles, bones, joints, skeletal deformities).

- **Social contact**

The expression of normal social behaviour depends on the housing system and management, where both the isolation of animals and the excessive concentration of animals contributes to social stress and aggression.

- **Floor quality**

  Due to the constant contact of animals with floor and bed surfaces, the quality of these surfaces has one of the most significant impacts on health - feet, limbs slip injuries - behaviour and well-being.

- **Microclimate quality and ventilation level**

  Air quality is undoubtedly an important factor in a healthy environment. Avoiding draught reduces heat loss and reduces the risk of cold stress. Light affects animal health, fertility and behaviour through its spectrum, intensity and seasonal changes.

  Intensity of breeding care

  The relationship between animals and their keepers influences the animals' response to a range of factors. A friendly attitude not only increases the sociability of the animals but also has a positive effect on immunological responses and performance.

Results of the evaluation of the ANI system

< 11 – does not comply with the welfare principles

11-15 – hardly complies with the welfare principles

16-20 – insufficiently complies with the welfare principles

21-23 – relatively compliant with welfare principles

24-27 – complies with the welfare principles

> 28 - fully complies with the welfare principles

Benefits of the ANI (TGI):

- A practical tool to assess the main deficiencies in breeding within a short time interval.
- ANI assesses welfare using criteria for different aspects of the farming environment and the animals themselves in a systematic way.
- The assessment requires a relatively short time to train the observer, this training is critical to the reliability of the assessment.
- The repeatability of scores on the same farm by different observers is high.

Disadvantages of the ANI (TGI):

- **Subjectivity of evaluation** - is the floor slippery or not.
- **The situation on the farm during summer may be different** than in winter. Outdoor farming systems are influenced by climatic conditions.

In Switzerland, dairy farmers receive support from the government if their farming system is extensive (welfare-friendly), using regular grazing and outdoor runs. The methods used to assess welfare are based on a description of the housing system, an interview with the farmer, behavioural observations and a clinical examination of the dairy cows, which focuses on the incidence of injuries, hoof diseases and the general body condition of the animals. In this method, half of the parameters monitored were based on recording parameters arising from observations of individual animals. The breeding evaluation is carried out over a period of two years, and in each year, the breeders are visited four times. The effect of different housing and management systems is analysed by multivariate statistical analysis and the results of this analysis provide farmers with information on which aspect of housing technology has a statistically highly significant effect on the welfare of dairy cattle.

Development of Ethical Account for Animal Husbandry (Denmark)

- The system was developed for dairy cattle and pigs.
- The evaluation was based on information on rearing technology, management, animal behaviour records and animal health.

Data were recorded every second week by trained technicians and this recording took about 1 hour to an hour and a half depending on herd size.

Four times a year, tests for signs of fear of humans were conducted on a selected sample of the herd.

Health data were provided by veterinarians who performed a clinical examination of all animals once every 4 months, to which data routinely obtained during any treatment of the animals were also added. The assessment resulted in an annual report containing individual measurements as well as a description of the welfare status of the farm. The report also included a comparison of this status with the previous year. The disadvantage of the method was that it did not allow comparison of welfare levels between farms and was also unable to provide certification of welfare standards on the farm.

Method for assessing the welfare of laying hens (Sweden)

- Verification of new breeding facilities that had to be tested for animal health and suitably constructed enclosures.
- Testing carried out on a representative sample of the breeding flock. The method is based on individual animal parameters - production, health, mortality and behaviour.
- Farms were visited several times during the production cycle, clinical examination was performed 3 times and lasted 2-3 hours.
- The welfare assessment method results in the disapproval of the welfare conditions of the new farm or its recognition.

Method for the evaluation of equine welfare (Switzerland)

- The method used parameters expressing the housing.
- All parameters were scored from 0 to 4. 4 was the optimal situation.
- For each housing system, the result of well-being was calculated in 3 areas:
- husbandry technology, husbandry management and management of horse training

At present the number of commercial schemes in the food chains in many European countries are working to further raise of welfare levels above the legal minimum. For these purposes, the stall-based assessment system is no longer sufficient, so welfare assessment schemes are being developed at national level or by breeders' associations or food chains to include elements of animal-based assessment. At European level, the most prominent scheme of this type is the Welfare Quality Scheme, which was developed in 2005-2009 by a collaborative research effort of European agricultural universities and research institutes.

Developed by 150 scientists, the system proposes standards for the welfare assessment of cattle, pigs and poultry

The Welfare Quality® project was developed on behalf of the European Commission to assess welfare levels in three livestock species. The assessment systems were presented on 9 October 2009 at the Animal Welfare Conference in Uppsala (Sweden). The aim of the system is to assess animal welfare on farms and slaughterhouses based on the measurement of welfare parameters for individual animals.

Principles of welfare evaluation by the Protocols Welfare Quality®

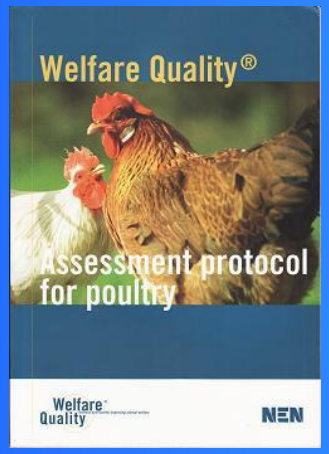
http://www.welfarequality.net/network/

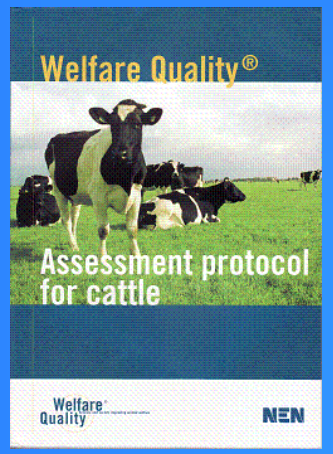
The system offers protocols for welfare assessment of the three most economically and numerically important categories of livestock.

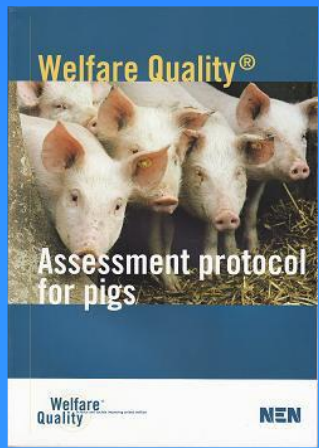
<u>The systems are governed by the following principles:</u>

1. They cover 4 key areas of welfare:

- Good nutrition
- Good housing
- Good health
- Good behaviour







2. The level in these areas is measured using values determined preferably directly on the animals in a simple, on-farm way.
3. It establishes a clear procedure by which the obtained values are combined into an overall assessment.
4. This evaluation includes the farm in one of four categories:

- excellent
- superior
- accetable
- uncategorized

Areas and welfare criteria

Within the above four welfare areas, 12 criteria are assessed :

Welfare area	Welfare criteria
Good nutrition	1. Absence of long-term hunger 2. Absence of thirst
Good housing	3. Comfort when resting 4. Termal comfort 5. Easy movement

Video –Welfare Quality

Good health	**6. Absence of injury** **7. Absence of diseases** **8. Absence of painful procedures**
Good behaviour	**9. Realization of social behaviour** **10. Realization of other behaviour** **11. Good human-animal relationship** **12. Positive emotional state of animals**

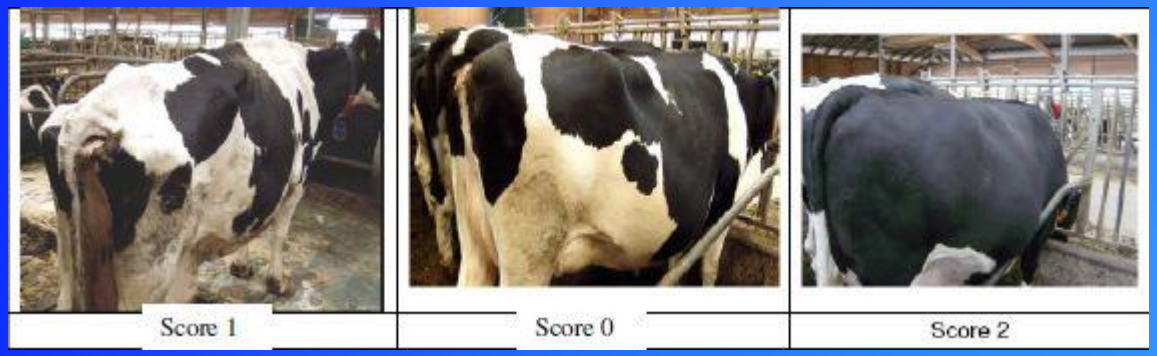
Several specific measurements contribute to each of these criteria for a given species, with a total of 30 in the protocol for dairy cows.

For example, for dairy cows, the area of good health is assessed as follows:

in criterion 6: *absence of injury*– the percentage of lame animals and the presence of skin lesions and swellings are assessed,

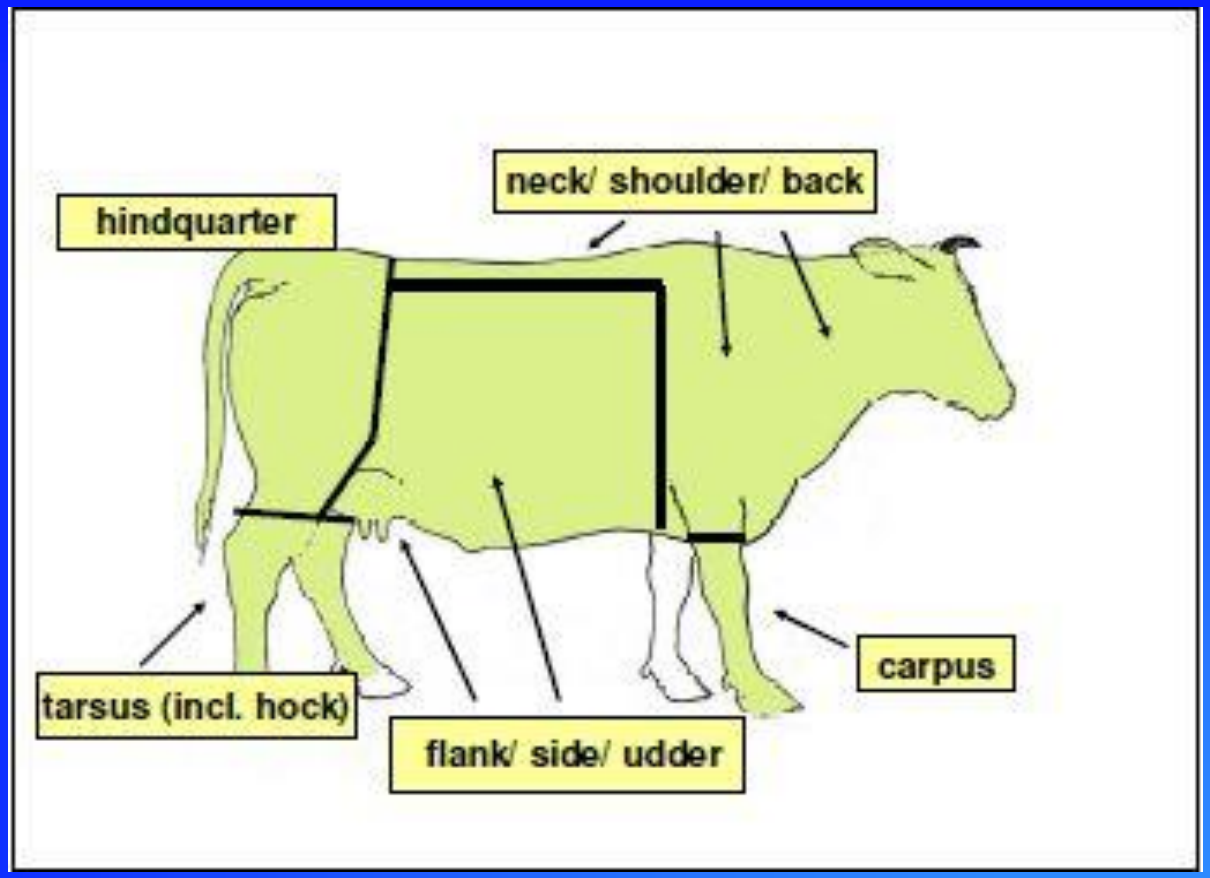
in criterion 7: *absence of disease* – coughing, nasal and ocular disorders, dyspnoea, diarrhoea, vulvar disorders, somatic cells in milk, mortality, dystocia and the occurrence of immobile animals,

in criterion 8: *absence of painful procedures* – method of dehorning, tail docking in dairy cows.



0 – Regular body condition, **1** – Very lean: indicators for 'very lean' present in at least three body regions, **2** – Very fat: indicators for 'very fat' present in at least three body areas

Good health– areas of animal examination



From a distance not exceeding 2 m, five body regions on one side of the animal have to be examined with regard to these criteria:
Hairless patch, • area with hair loss, • skin not damaged, • extensive thinning of the coat due to parasites, • hyperkeratosis possible lesion/swelling: • damaged skin either in form of a scab or a wound, • dermatitis due to ectoparasites, • ear lesions due to torn off ear tags

Overall farm rating

- **Excellent** – more than 55 points in all 4 areas and more than 80 points in at least 2 areas.
- **Superior** – more than 20 points in all 4 areas and more than 55 points in at least 2 areas.
- **Acceptable** – more than 10 points in all 4 areas and more than 20 points in at least 3 areas.
- **Uncategorized** – does not even meet the requirements for an acceptable rating.

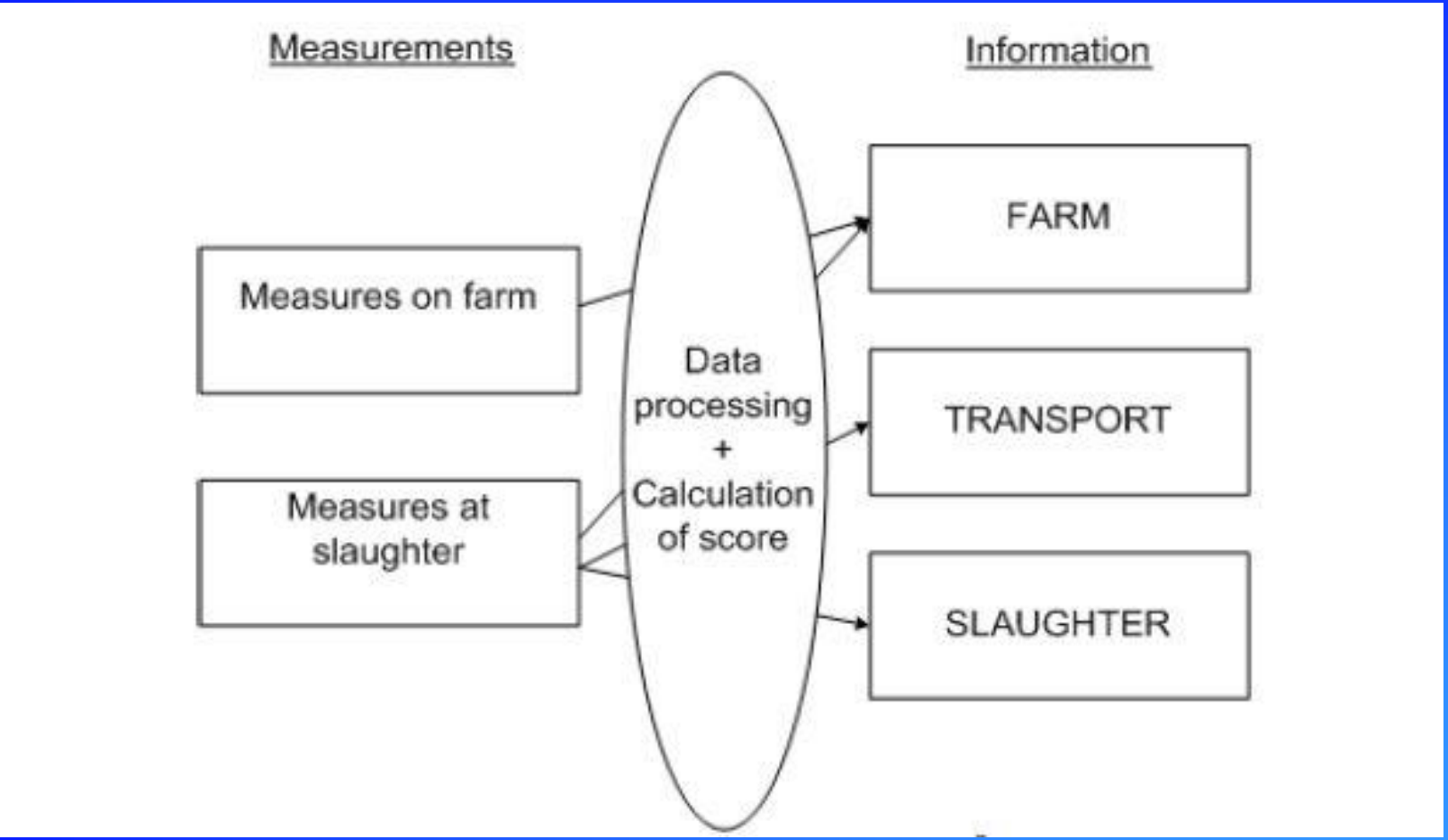
The overall rating of the farm depends on the score for all 4 areas. For each area, a score from 0 to 100 is possible.

Practical importance of Welfare Quality principles

The principles of this system can be used for a **simple self-assessment of one's own farm, to compare one's own breeding with other farms and to look for areas in one's own breeding where improvements in welfare would be most needed** or most easily achieved.

Possible approach may be to evaluate the breeding according to **12 criteria**, or even according to individual criteria in comparison with other breeds in the area or with comparable breeds.

The different sources of information in Welfare Quality®.



AWIN Animal Welfare Indicators

(project AWARE – Animal Welfare Research in an enlarged Europe) 2014

- **The research objectives to be carried out in the Workpackages (WP1, WP2, WP3, WP4), focused on species that, although commercially relevant world-wide, have so far been overlooked in animal welfare assessments. These species are sheep, goats, horses, donkeys and turkeys.**

- **The goal of the Coordination and Support Action of the 7th Framework Programme AWARE was to promote integration and increase the impact of European research on farm animal welfare (FAW). It was done through the development of Europe-wide networks of scientists, lecturers and students, and by establishing a network of stakeholders active in FAW knowledge transfer and implementation.**
  AWARE actions were organised in 4 mutually supportive Work Packages (WPs):
  WP 1 "Research" enhanced the integration of FAW research by supporting collaboration based on mutual recognition and by enhancing networking and proposal writing skills in motivated researchers throughout the enlarged Europe.

- **WP 2 “Education” promoted cross-enrichment in FAW and university education, thus enhancing opportunities for young scientists in new and candidate countries to start research in FAW.**
- **WP 3 “Awareness and Implementation” focused on enhancing public awareness, promoting implementation of EU policies, and facilitating uptake of FAW research.**
- **WP 4 “Mobility Desk” facilitated mobility of researchers and students.**

- **The project was cancelled in 2014.**


Scandinavia
North West
Baltic
West Central Europe
East Central Europe
Mediterranean
Eastern Balkan
Western Balkan
IASP (CZ)
SLU (SE)
WUR (NL)
EMU (EE)
BOKU (AT)
SUA (SK)
INRA (FR)
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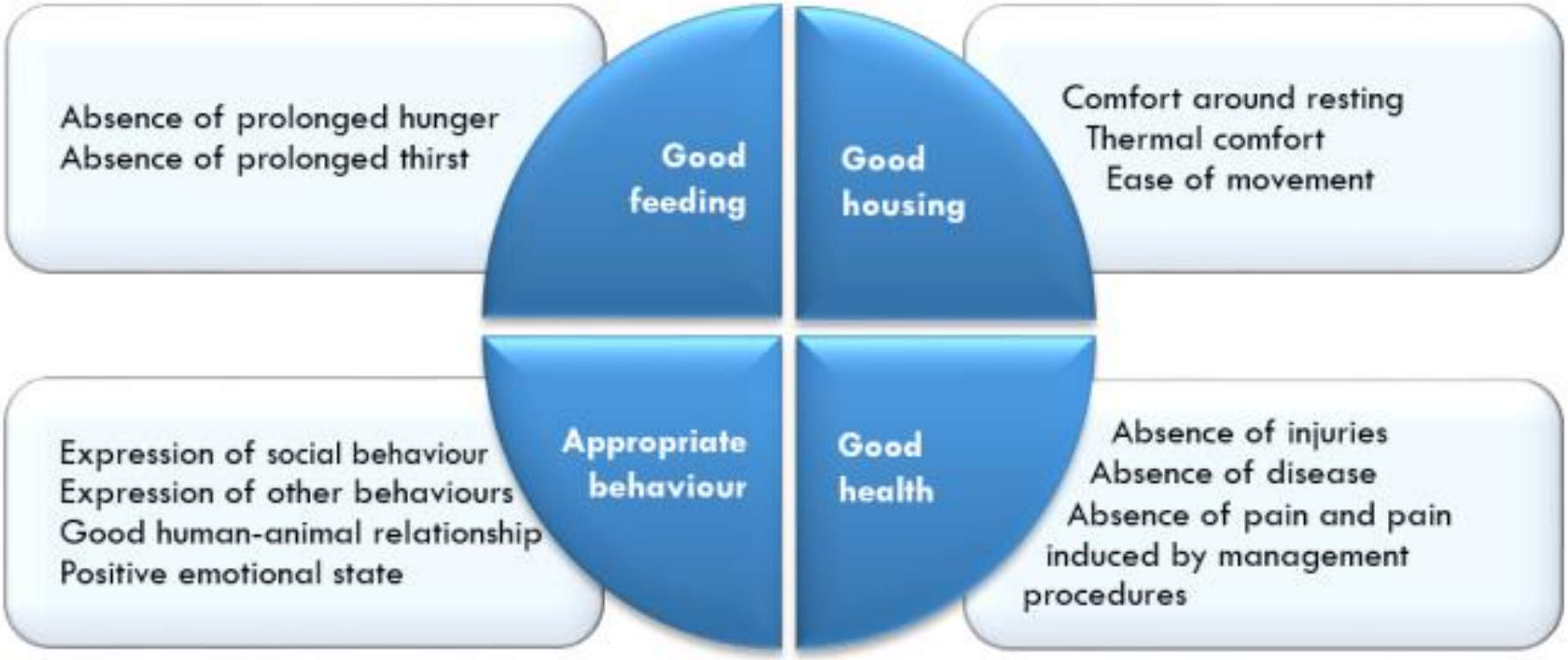
Figure 1. Welfare principles and criteria according to Welfare Quality®



The area of good feeding in sheep

Water availability

- Checking the presence of water points and evaluating their functioning, accessibility and cleanliness.

How to assess:

- Enter the enclosure (pen, field, paddock…) where sheep are located and check:

How to score:

No water point	**Bucket/trough** Any water container which is manually filled by the owner and contains some water.	**Automatic drinker** A water container connected with the water network, which is automatically filled at every use.	**Natural water source** A pond, stream or river, which is accessible by sheep and contains clean water.
			

Evaluate if the automatic drinker is functioning and accessible (score the prevalent condition).

Functioning
Check if the automatic drinker is working properly.

Not functioning
Check if the water source is accessible (i.e. not overgrown or with steep banks) and showing evidence of use by sheep.

Evaluate the drinker cleanliness (score the prevalent condition).

Dirty
Water points and water dirty at the moment of inspection. Natural water sources are stagnant or polluted.

Partly dirty
Water points dirty but water fresh and clean at the moment of inspection. Water source may be contaminated (e.g. with rubbish) but water appears clean.

Clean
Water points and water clean at the moment of inspection. Natural water sources are clean and unpolluted.

Protokol AWIN sheep

Welfare principles	Welfare criteria	Welfare indicators
Good Feeding	Appropriate nutrition	Body Condition
		Score lamb mortality
	Absence of prolonged thirst	Water availability
Good Housing	Comfort around resting	Fleece cleanliness
	Thermal comfort	Panting
		Access to shade/shelter (outdoors only)
	Ease of movement	Stocking density (housed animals only)
		Hoof overgrowth (housed animals only)
Good Health	Absence of injuries	Body and head lesions
		Leg injuries
	Absence of disease	Lameness
		Faecal soiling
		Mucosa colour
		Ocular discharge
		Mastitis and udder lesions (lactating ewes onl
		Respiratory quality
		Fleece quality
	Absence of pain and pain induced by management procedures	Tail length
Appropriate Behaviour	Expression of social behaviour	Social withdrawal
	Expression of other behaviours	Stereotypy
		Excessive itching
	Good humant animal relationship	Familiar human approach test_
	Positive emotional state	Qualitative Behaviour Assessment

AssureWel

http://www.assurewel.org/

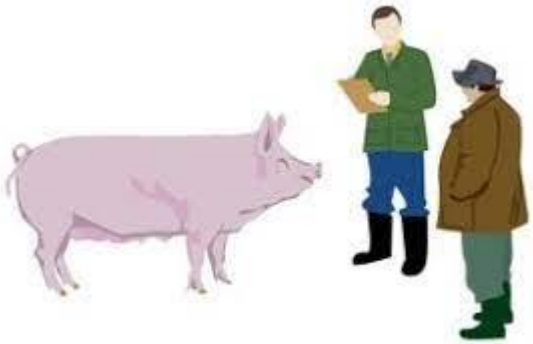
AssureWel was a 6 year (2010-2016) collaborative project led by the RSPCA, Soil Association and University of Bristol, supported by the Tubney Charitable Trust. Its main aim was to develop a practical system of welfare outcome assessment for the major farm animal species, which can be used in farm assurance schemes.

Pigs

The following measures have been identified by AssureWel as being important indicators of pig welfare. The criteria to select these 'core' measures included consideration as to how practical they are to assess on farm.

There are assessments for both dry sows and finishing pigs, which vary slightly in measures and assessment approach:

1. Enrichment use
2. Lameness
3. Tail docking
4. Nose ringing (dry sows only)
5. Ear and flank biting
6. Pigs needing further care
7. Hospital pen
8. Body marks
9. Tail lesions (finishers only)
10. Shoulder lesions (dry sows only)
11. Vulva lesions (dry sows only)
12. Manure on the body
13. Leg swellings
14. Skin conditions
15. Body condition (dry sows only)
16. Mortality



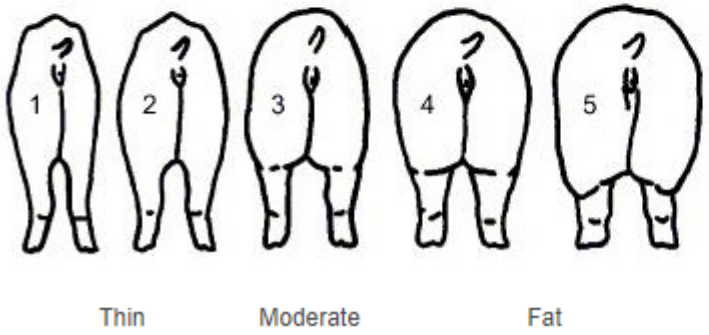
Body condition

Why is it measured?

Regular body condition scoring of pigs can identify suboptimal feed, health and environmental management of sows during previous lactation or during pregnancy. Good stockmanship should take into consideration the nutritional needs of every pig as serious weight loss may be difficult to regain, especially in group feeding systems. Sows with poor body condition produce litters with low birth and weaning weights and are likely to have smaller subsequent litters; they are at increased risk of shoulder lesions and may display increased stereotypic behaviour. Fat sows may suffer from leg weakness, increasing the risk of injury and are at increased risk of certain diseases including Mastitis Metritis Agalactia.

How to assess and score using the AssureWel measure

Body condition (dry sows)	Individual measure
Observation:	Visually assess from the side and behind. Manual assessment can help distinguish borderline scores.
Record:	
Thin	= **Score 1 or 2:** Ribs, backbone, 'H' bones and 'pin' bones obvious (or easily detected with pressure);
	= **Score 3:** Ribs, backbone, 'H' bones and 'pin' bones barely visible (or barely felt with firm pressure);
Moderate	= **Score 4 or 5:** Ribs, backbone, 'H' bones and 'pin' bones cannot be seen (or felt even when pressure is applied) or fats deposits are clearly visible.
Fat	



R.Coffey, thepigsite.com

The goal of the project is to support the use of verified outputs and knowledge in the field of farm animal welfare by publishing them annually, organizing seminars for traders in the food industry, providing training for veterinarians, inspectors and external consultants.

The main advantage of AssureWel evaluation system is its subsequent use in the certification of food produced under the RSPCA Freedom Food certificate and in the Soil Association certification schemes. Both certifications indicate animal products coming from enterprises registered as part of organic farming and at the same time meeting the criteria of a good level of welfare.

The assessment of the level of welfare using the AssureWel methodology can be carried out by a trained person with sufficient experience in the field and with knowledge of the breeding issues of the given species of farm animal. To correctly apply the methodology and obtain relevant results, it is necessary to complete **an internet course** that will teach the future observer how to use the protocols, how to correctly assess the individual criteria and how to subsequently evaluate and interpret the results.

THANK YOU FOR ATTENTION