Working document “Cross Analysis”

Animal Welfare Recording Working Group

Report for the ICAR Secretary General and ICAR Board

Version 1.1

Contributors:

This document is the production of the ICAR Animal Welfare Recording WG:

- Elisabeth BERRY (DairyCo – UK; chair of IDF Standing Committee on animal health and animal welfare)
- Maria DEVANT GILLE (IRTA – Spain)
- Pierre-Louis GASTINEL (France Génétique Elevage –France), chair of the ICAR AWR WG (writer)
- Daniel LEFEBVRE (Valacta – Canada)
- Lindsay R. MATTHEWS (University of Münster – Germany)
- Luc MIRABITO (Institut de l’Elevage – France)
- Olav OSTERAS (TINE- Norway, deputy chair of IDF Standing Committee on Animal Health and Welfare)
- Kathrin F. STOCK (vit – Germany)
- Alessia TONDO (AIA – Italy)

With the collaboration of: Christa EGGER-DANNER, chair of ICAR Functional Traits WG

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1 List of Suggestions

Clarity and ease of locating relevant sections of the ICAR recommendations for monitoring and improving animal health may be improved by some restructuring and improved referencing / cross-linking in future versions of the ICAR guidelines.

Guidelines for the recording of docility and temperament and possibly other behaviour traits should be elaborated.

The possible role of recording of resource-based indicators should be included in the ICAR guidelines.

Analogies of trait recordings in beef and dairy cattle should be reflected by reciprocal structure of the guidelines or improved cross-referencing.

Recommendations on the recording of behaviour traits should be completed and possibly extended, with appropriate consideration of the necessary concurrent recording of animal-based and resource-based data recording.

Environmental parameters of possible relevance for phenotype interpretation and animal welfare assessment should be mentioned in the ICAR guidelines. The feasibility of recording in different surroundings and potential suitability of the recordings for routine analyses need to be considered. For detailed information, reference should be made to existing approved guidelines for assessing animal operations and surroundings (pasture or housing, walking surface, ….).

Include recommendations to reduce pain during pelvic opening measure, or alternative methods as ultrasound.

Include standardized descriptions for:

- Castration: neutered, entire; use of analgesia
- Horning: horned, pooled, scurred, dehorned (sawed horn, burned horn…) use of analgesia
- Tail docking: cutted tail, shortened tail…. use of analgesia
- Identification by branding or liquid nitrogen

Add a standardized description for « docility », which is an animal trait with a real phenotypic, environmental and genetic variance.

In relation to operator training:

- to add in the chapters on training of operators, requirements in accordance with the animal welfare principles
- and to add a chapter on the operators for pelvic opening and their training, in the chapter 3.2.3.3.3.12, p122.

2 Why is animal welfare important for ICAR members?

Animal welfare is increasingly becoming a part of the social 'license' to farm. To date, most of the effort to improve animal welfare has focused on changing environmental and other husbandry inputs. However, heritable animal traits provide the opportunity to improve welfare through breeding. Selection of 'welfare focused' traits through breeding choices results in long term benefits in all offspring. Recording organizations can play an important role in animal welfare assessment and improvement along with generating a large accessible database. Many animal-based parameters, including some potential new ones connected with milk composition, are routinely recorded and offer a practical means for improving welfare through both management and breeding.

Thus recording organizations and ICAR can support the practical implementation of the 1rst principle of Terrestrial Code of World Organisation for Animal Health (OIE) on animal welfare: "Genetic selection should always take into account the health and *welfare* of *animals".*

From the data collected on individual animals, relevant welfare traits could be selected/derived and used for routine analyses. Using genetic tools for improving animal welfare requires the coordinated efforts of animal breeding organisations and farmers, to identify and include socially relevant and scientifically validated traits in selection indices. Several public and private organisations are developing standards and regulations for animal welfare. ICAR Guidelines should review these standards and regulations in order to assess them for validation and practical purposes.

Data routinely collected on individual animals by the recording organisations could be valuable for monitoring and improving animal welfare at both the farm level and population level. A wide range of traits has the potential to serve as animal welfare indicators:

- Production traits like milk yield, milk composition, or growth rate
- Functional traits which are already broadly recorded and included in breeding programs like longevity / survival measures (e.g. functional herd life), culling reasons, conformation, calving ease, fertility, indirect health traits (e.g. SCS)
- New functional traits of increasing importance like body condition, mortality, metabolic stress, direct health traits (e.g. disease diagnoses, lameness, foot and leg conditions)

This list could be extended and refined by new traits, and measures of relevant environmental aspects could be included as well.

Data collected already for genetic selection purposes, have several important characteristics such as standardised recording methods and regular recording intervals by trained staff. These features allow a move towards quantitative risk assessment of animal welfare traits.

The recording organisations form a worldwide routine data collection network, which concerns 30 million animals in 53 countries across 5 continents. The common practice of standardized recording as outlined in the ICAR guidelines can be used as a key tool for the improvement and the management of animal welfare.

3 ICAR Guidelines and OIE principles on animal welfare?

Are the ICAR Guidelines consistent with the principles of World Organisation for Animal Health (OIE) on animal welfare?

Internationally, five freedoms are included in the concept of animal welfare:

- freedom from hunger, thirst and malnutrition;
- freedom from fear and distress;
- freedom from physical and thermal discomfort;
- freedom from pain, injury and disease ; and
- freedom to express normal patterns of behaviour

Guided by these five freedoms, the World Organisation for Animal Health (OIE), in the article 7-1-4 of the Terrestrial Code, defined 11 principles for the **welfare of animals in livestock production systems:**

1. Genetic selection should always take into account the health and welfare of animals.
2. Animals chosen for introduction into new environments should be suited to the local climate and able to adapt to local diseases, parasites and nutrition.
3. The physical environment, including the substrate (walking surface, resting surface, etc.), should be suited to the species so as to minimise risk of injury and transmission of diseases or parasites to animals.
4. The physical environment should allow comfortable resting, safe and comfortable movement including normal postural changes, and the opportunity to perform types of natural behaviour that animals are motivated to perform.
5. Social grouping of animals should be managed to allow positive social behaviour and minimise injury, distress and chronic fear.
6. For housed animals, air quality, temperature and humidity should support good animal health and not be aversive. Where extreme conditions occur, animals should not be prevented from using their natural methods of thermo-regulation.
7. Animals should have access to sufficient feed and water, suited to the animals' age and needs, to maintain normal health and productivity and to prevent prolonged hunger, thirst, malnutrition or dehydration.
8. Diseases and parasites should be prevented and controlled as much as possible through good management practices. Animals with serious health problems should be isolated and treated promptly or killed humanely if treatment is not feasible or recovery is unlikely.
9. Where painful procedures cannot be avoided, the resulting pain should be managed to the extent that available methods allow.
10. The handling of animals should foster a positive relationship between humans and animals and should not cause injury, panic, lasting fear or avoidable stress.
11. Owners and handlers should have sufficient skill and knowledge to ensure that animals are treated in accordance with these principles.

The ICAR AWR WG has compared the ICAR Guidelines and each of these principles. Changes to the ICAR guidelines are proposed in order to have more a consistent approach to animal welfare across all ICAR members.

3.1 Principle n°1

Principle n°1: Genetic selection should always take into account the health and *welfare* of *animals*.

The recording of animal traits as described in ICAR Guidelines is used for both genetic evaluation and also the monitoring of husbandry and general management practices. Thus, ICAR guidelines give the standards for the recording and use of animal traits and also some environmental parameters, which may have an influence on phenotypes. Both animal-based and environmental measures are useful with regards improvement in animal welfare - measures of the environment can identify risk factors for poor welfare; and environment and animal factor interactions can affect welfare.

While ICAR provides both definitions and standards for the recording of traits primarily of economic importance, the areas of animal health and welfare must also be covered in ICAR's work, particularly the ICAR guidelines. However, the definition of minimal requirements for environmental conditions from an animal welfare point of view is beyond the scope of the ICAR Guidelines.

The critical relationship between animal health and animal welfare indicates a major role in the recording of health traits, in the context of animal welfare improvement. An animal can only be in a good state of welfare if, amongst other things, it is healthy (art 7.1.1 and 7.2.1 of Terrestrial Code).

3.1.1 Health Traits

Health traits are specifically addressed in the section 16 of ICAR guidelines: « ICAR Guidelines for recording, evaluation and genetic improvement of health traits » (with annex 16A).

The main health traits described belong to one of the following four disease groups:

- Udder health (§16.9.1)
- Reproductive disorders (§16.9.2)
- Locomotory diseases (§ 16.9.3)
- Metabolic and digestive disorders (§16.9.4)

Given the high importance of foot and leg conditions in dairy cattle, an international and interdisciplinary expert group is currently working on specific recommendations for this topic.

In the current ICAR guidelines, further information on health aspects can be found in other sections: in section 3, the "Guidelines for meat production recording", "health traits" inside the chapter 3.2.3.9 and, "tick count recording" inside the chapter 3.2.3.10 is addressed; in section 7, the" ICAR Guidelines for udder health recording", detailed information on udder health is included.

Suggestion of the AWR WG:

Clarity and ease of locating relevant sections of the ICAR recommendations for monitoring and improving animal health may be improved by some restructuring and improved referencing / cross-linking in future versions of the ICAR guidelines.

3.1.2 Welfare Traits:

Alongside the health traits mentioned, there are, in different chapters, guidelines for the recording of animal-based traits which are potentially usable as welfare indicators:

- Freedom from hunger, thirst and malnutrition :- "Body condition" as possible indicator for malnutrition, is described in chapter 3.2.3.6.4 for beef cattle (section 3 –meat production recording), and in chapter 5.1.4.18 for dairy cattle (section 5 – conformation recording).

- Freedom from fear and distress :- Temperament or docility, which may serve as an indicator for fear and distress, are not yet included in the ICAR guidelines, although genetic evaluations are routinely performed for these traits in many countries (docility) and Interbull (temperament).

Suggestion of the AWR WG:

Guidelines for the recording of docility and temperament and possibly other behaviour traits should be elaborated. This may be included within work planned by the ICAR WGFT under workability

- Freedom from physical and thermal discomfort: Basically, animal outcomes could indicate if there is a welfare issue. Otherwise, because of the complex interplay between the animal and its environment, animal welfare assessment in terms of this freedom requires simultaneous animal-based and resource-based data recording.

Suggestion of the AWR WG:

The possible role of recording of resource-based indicators should be included in the ICAR guidelines.

- Freedom from pain, injury and diseases :

Besides the direct health traits, described above, there are guidelines for the recording of calving ease for beef cattle in the chapter 3.2.3.3.3.10 (section 3 –meat production recording). It is important to control it in order to balance the size of the calves, in dairy cattle as in beef cattle.[1]

Suggestion of the AWR WG:

Analogies of trait recordings in beef and dairy cattle should be reflected by reciprocal structure of the guidelines or improved cross-referencing.

- Freedom to express normal patterns of behaviour : The mothering behaviour, i.e. the way the mother behaves towards her calves, is mentioned in ch. 3.2.3.3.3.8 (section 3 –meat production recording), but no details are provided with regards the recording of this. References to any measures of the spectrum of behaviours that can be expressed by the animal in its environment are missing in the ICAR guidelines.

[1] It could be included a separate guideline for calving, where beside calving ease, stillbirth, postnatal mortality also disorders close to calving would be considered. In Austria and Germany with recording of calving ease the farmer is asked whether for retained placenta, downer cow syndrome, ….

Suggestion of the AWR WG:

Recommendations on the recording of behaviour traits should be completed and possibly extended, with appropriate consideration of the necessary concurrent recording of animal-based and resource-based data recording..

3.1.3 Genetic Evaluations

International genetic evaluations (GE) produced by Interbull Center for health and welfare traits.

In 2014, Interbull Center produced international GE for several traits relevant for health and welfare, in dairy cattle:

- Udder health traits
- Calving ease ….
- Locomotion
- Workability: temperament and milking speed

Considering the data sent to Interbull from every country, not all of these international GE are available for all breeds or countries. In addition, transparency regarding the trait definitions, particularly whether direct or indirect traits are being considered could be improved.

For beef breeds, preliminary analysis for the GE of calving traits and mortality from birth are in progress.

For most countries national GE are produced for:

- Foot and leg conditions (claw health, lameness)
- Specific diseases (direct health traits including for example mastitis, reproductive disorders, metabolic disorders)
- Docility (behaviour in the human-animal relationship)

3.2 Principle n°2

Principle n°2: *Animals* chosen for introduction into new environments should be suited to the local climate and able to adapt to local *diseases*, parasites and nutrition.

Question on ICAR Guidelines: Are there measures of local environmental suitability considered in the ICAR guidelines?

The tick count recording is described in ch. 3.2.3.10 (beef cattle).

No other measures or traits related to the local environmental suitability could be identified in the ICAR guidelines.

3.3 Principle n°3

Principle n°3: - The physical environment, including the substrate (walking surface, resting surface, etc.), should be suited to the species so as to minimise risk of injury and transmission of diseases or parasites to animals

Question on ICAR Guidelines: What are the environmental parameters which potentially could influence animal welfare?

Recommendations regarding the recording of environmental parameters e.g. housing conditions are not included in the ICAR guidelines. In order to identify particular risk factors among the environmental measures, recording of the direct disease traits (outcomes) must be improved.

Suggestion of the AWR WG:

Environmental parameters of possible relevance for phenotype interpretation and animal welfare assessment should be mentioned in the ICAR guidelines. The feasibility of recording in different surroundings and potential suitability of the recordings for routine analyses need to be considered. For detailed information, reference should be made to existing approved guidelines for assessing animal operations and surroundings (pasture or housing, walking surface, ….).

3.4 Principle n°4

Principle n°4: The physical environment should allow comfortable resting, safe and comfortable movement including normal postural changes, and the opportunity to perform types of natural behaviour that animals are motivated to perform.

Recommendations regarding the recording of environmental parameters e.g. the housing conditions are not included in the ICAR guidelines. In order to identify particularly positive and negative factors with regards animal behaviour among the environmental measures, recording of the behaviour traits must be improved.

3.5 Principle n°5

Principle n°5: Social grouping of *animals* should be managed to allow positive social behaviour and minimise injury, distress and chronic fear.

Question on ICAR Guidelines*:* In ICAR Guidelines, are there recommendations for recording « social behaviour », « injury, distress and chronic fear » ?

There is no description of recording « social behaviour », except a short reference to « mothering behaviour » (as mentioned in the analysis of principle n°1).

3.6 Principle n°6

Principle n°6: For housed animals, air quality, temperature and humidity should support good animal health and not be aversive. Where extreme conditions occur, animals should not be prevented from using their natural methods of thermo-regulation.

No comments relevant in the ICAR Guidelines

3.7 Principle n°7

Principle n°7: Animals should have access to sufficient feed and water, suited to the animals' age and needs, to maintain normal health and productivity and to prevent prolonged hunger, thirst, malnutrition or dehydration.

Health traits, productivity traits, and body condition score, as described in ICAR guidelines are potentially usable indicators of hunger, thirst, malnutrition or dehydration.

3.8 Principle n°8

Principle n°8: diseases and parasites should be prevented and controlled as much as possible through good management practices. Animals with serious health problems should be isolated and treated promptly or killed humanely if treatment is not feasible or recovery is unlikely.

Question on ICAR Guidelines*:* How is the recording of diseases and parasites described in ICAR Guidelines?

Cf analysis of § "health traits" in principle N°1.

Information on diseases have to be documented in several countries by legal regulations e.g. Austria (Egger-Danner et al. 2012 J. Dairy Sci)

For example, in Austria, farms who are members of the Animal Health Organisations are also checked at least one a year where also information on parasites and welfare is recorded. They provide reports where the farm can compare itself for some key parameters in animal health to the population.

3.9 Principle n°9

Principle n°9: Where painful procedures cannot be avoided, the resulting pain should be managed to the extent that available methods allow.

Question A on ICAR Guidelines*:* For the recording process described in ICAR Guidelines, which ones are potentially painful?

Analysis: Many routine handlings are potentially painful, if performed inappropriately. Recommendations on the good practice of routine procedures can help minimizing animal pain.

Some specific recordings, as pelvic opening measuring, require guidelines with specific procedures to reduce pain.

Suggestion of the AWR WG:

Include recommendations to reduce pain during pelvic opening measure, or alternative methods as ultrasound.

Question B on ICAR Guidelines*:* Are there requirements for the recording of painful procedures as castration, dehorning, tail cutting?

Analysis: No, there are no details for the recording of these animal traits.

Suggestion of the AWR WG

Include standardized descriptions for:

- Castration: neutered, entire; use of analgesia
- Horning: horned, pooled, scurred, dehorned (sawed horn, burned horn…) use of analgesia
- Tail docking: cutted tail, shortened tail…. use of analgesia
- Identification by branding or liquid nitrogen

3.10 Principle n°10

Principle n°10 The handling of animals should foster a positive relationship between humans and animals and should not cause injury, panic, lasting fear or avoidable stress.

Question on ICAR Guidelines: Are there requirements for recording of the animal behaviour in the relationship between humans and animal?

Analysis: No, there are no such requirements.

Suggestion of the AWR WG:

Add a standardized description for « docility », which is an animal trait with a real phenotypic, environmental and genetic variance.

3.11 Principle n°11

Principle n°11 Owners and handlers should have sufficient skill and knowledge to ensure that animals are treated in accordance with these principles.

Questions on ICAR Guidelines: Which handlers are considered in ICAR guidelines? How are these handlers identified? How are these handlers trained?

Analysis: The operators considered in ICAR Guidelines are:

- Operators for insemination (ch 1.2.4.4.5, p13)
- Operators for ultrasound measurement (chap 3.2.3.7, p140)
- Classifiers for conformation and type recording (chap 3.2.3.6, p131 for beef cattle, and 5.2, p216 for dairy cattle)
- Professional claw trimmers

Each of these chapters contents requirements on training, monitoring and auditing of the operators, but no requirements with regards the animal welfare principles

The AWR WG suggests:

- to add in the chapters on training of operators, requirements in accordance with the animal welfare principles
- and to add a chapter on the operators for pelvic opening and their training, in the chapter 3.2.3.3.3.12, p122.

4 Welfare Measures in ICAR Guidelines

Which measures are necessary to assess the animal welfare indicators? Do these measures find a right place in ICAR Guidelines?

Foreword:

These take into account the animal-based measures and the resources-based measures
These measures are classified using the five basic freedoms of animal welfare.
These take into account, as reference, the indicators proposed for beef cattle in the chapter 7.9.4 of "Terrestrial code" of OIE, the criteria proposed in "Welfare Quality Assessment Protocol", for beef and dairy cattle, and the animal-based measures proposed by EFSA. Several criteria of Welfare Quality Protocol are considered also by EFSA. This analysis has to be completed in 2015, after the publication of the chapter "Dairy cattle welfare" of the Terrestrial Code.

Lastly, this work is not exhaustive as many traits already described in ICAR guidelines could indirectly have a part in the welfare indicators (e.g.: production traits). It is most important to identify those areas where there are gaps: either traits to be developed or new traits to be introduced.

4.1 Freedom from hunger, thirst and malnutrition;

Welfare criteria or indicators	Measures (ref[2])	ICAR Guidelines
Absence of prolonged hunger	Body condition (OIE and WQ-EFSA)	"Assessment of body condition" (beef cattle) Ch 3.2.3.6.4 (p 136) "Body condition score" (dairy cattle) Ch 5.1.4.18 (p 211)
Absence of prolonged thirst	Changes in weight (OIE)	"Live animal weights" (beef cattle) ch. 3.2.3.5, (P125), including: "Recommendation for growth traits calculation" (beef) (ch 3.2.3.5.9, p130) "Chest girth circumference as a predictor of growth" (beef) (ch. 3.2.3.5.6, p127)
	Carcass conformation and fatness (scores lower than the ones expected for sex and breed corrected by age would be also indicative of poor	"Carcass grade" (beef) (ch 3.2.3.11.2, p163)

[2] OIE : Terrestrial Code of the World Organisation for Animal Health

WQ: Welfare Quality Assessment Protocol

EFSA: European Food Safety Authority

	conditions) (OIE)	

4.2 Freedom from fear and distress;

Welfare criteria or indicators	Measures (ref[2])	ICAR Guidelines
Good human-animal relationship Expression of social behaviour	Avoidance distance (WQ) Handling responses (OIE) Agonistic behaviour (WQ) Demonstration of aggressive behaviours	To be included: Recording of docility Recording of temperament

4.3 Freedom from physical and thermal discomfort;

Welfare criteria or indicators	Measures (ref[2])	ICAR Guidelines
Comfort around resting Ease of movement	Appearance physical (OIE): • presence of ectoparasites, • abnormal coat colour or texture or excessive soiling with faeces, mud or dirt Cleanliness of udders, cleanliness of flank/upper legs or lower legs (WQ) Presence of tethering, access to outdoor loafing area or pasture (WQ)	"Tick count recording" (beef) (ch 3.2.3.10, p160) (**to be extended to dairy**) **To be included:** Recording of cleanliness (alive animal in farm, or carcass at slaughterhouse) Recording of relevant resource-based measures

4.4 Freedom from pain, injury and disease;

Welfare criteria or indicators	Measures (ref[2])	ICAR Guidelines
Absence of injuries Absence of disease	Morbidity rates (OIE) Lameness (WQ-EFSA and OIE) integument alterations (WQ) Hock, knee and skin lesions, swelling (WQ-EFSA) Foot lesions (EFSA) Mortality rates (OIE) Coughing, nasal discharge, ocular discharge, hampered respiration, diarrhoea, vulvar discharge, milk somatic cell count (>400000 cells), mortality, dystocia, downer cows (WQ) Measures of mastitis (WQ-	Locomotory diseases (ch 16.9.3, p420) **(development In progress in WGFT)** Health traits definition (ch16.9, p418, and annex 16A, p537) to be extended to dairy cattle : • Calving ease (ch 3.2.3.3.3.10, p122) • Mortality from birth (ch3.2.3.3.3.13, p123) • Udder health (ch 7

	EFSA)	p231 and ch.19.9.1 p418)
absence of pain induced by management procedures	Complication due to routine procedure management (OIE) Disbudding/dehorning, tail docking, castration (WQ)	***To be included***, a standardized description for: Castration: neutered, entire (more details according the sex?) Horning: horned, pooled, scurred, dehorned (sawed horn, burned horn…) Tail docking: cutting tail, shortened tail…. Identification by branding or liquid nitrogen And resource-based measure (as use of analgesia…)

4.5 Freedom to express normal patterns of behaviour

Welfare criteria or indicators	Measures (ref[2])	ICAR Guidelines
Mothering behaviour		Mothering aptitude (ch3.2.3.3.3.8, p121) : ***to be developed,*** with details for the recording
	Reproductive efficiency (OIE)	Female reproduction (ch 3.2.3, p117) – **To be extended to dairy cattle**
	Feed intake (OIE and EFSA) Respiratory rate or panting (assessed by panting score) (OIE) Number of steps (OIE)	***To be included*** (new traits recordable with automatic sensors): Feed intake Rumination Respiratory rate Panting Number of steps
Positive emotional state	Qualitative behavioural assessment (WQ) Downer cows (WQ-EFSA)	Recording of temperament

5 References:

1. OIE – World Organisation for Animal Health

Terrestrial Animal Health Code – Section 7 « Animal welfare »

http://www.oie.int/index.php?id=169&L=0&htmfile=titre_1.7.htm

Article 7.1.4.: General principles for the welfare of animals in livestock production systems

Article 7.9.4. : Criteria or measurables for the welfare of beef cattle

2. Welfare Quality Network:

Welfare Quality Assessment Protocol for Cattle (October 1st 2009)

http://www.welfarequality.net/network/45848/7/0/40

3. EFSA Panel on Animal Health and Welfare (AHAW)

Scientific Opinion on the use of animal-based measures to assess welfare of dairy cows (EFSA Journal 2012; 10(1):2554)

http://www.efsa.europa.eu/en/efsajournal/pub/2554.htm

4. EFSA Panel on Animal Health and Welfare (AHAW)

Guidance on Risk Assessment for Animal Welfare (EFSA Journal 2012;10(1):2513)

http://www.efsa.europa.eu/en/efsajournal/pub/2513.htm