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Welfare Quality® project: from scientific research to on farm assessment of animal welfare

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ABSTRACT - Welfare Quality® is the acronym of the European research project “Integration of animal welfare in the food quality chain: from public concern to improved welfare and transparent quality”. This European project is focused on the integration of animal welfare in the food quality chain. Italian researchers from University of Milan, Naples, Padua, Parma and Pisa are involved in different tasks of this project. The second sub-project of Welfare Quality® aims to develop assessment systems to evaluate and monitor the quality of animal welfare on farms or at slaughter in 7 livestock species. Researchers of the Department of Animal Science of the University of Milan worked together other European partners to find and develop the most suitable animal-based measures for dairy and beef cattle.

Key words: Welfare Quality, Welfare assessment, Animal-based measures, Behaviour.

Animal welfare is an issue of increasing significance for European consumers and citizens (Miele and Parisi 2001, Blokhuis *et al.*, 2003). Animal welfare is an integral part of the Community’s “farm to fork” policies and is one of the strategic priorities related to the development of more sustainable food production policies. Recent CAP (Common Agricultural Policy) reform measures have introduced the principle of cross-compliance with various standards for beneficiaries of direct payments, including animal welfare standards, from 2007. The new framework of the reformed CAP encourage producers to reach higher welfare standards.

Animal welfare is a well-established scientific discipline and it is now recognised that welfare is multidimensional and therefore it can not be measured directly rather it is inferred from external parameters (Blokhuis *et al.*, 2006). Researchers agree that in order to assess animal welfare a wide variety of measures should be applied.

Since 2001, different welfare monitoring systems have been developed in some European countries such as animal welfare index TGI35L in Austria (Bartussek, 2001) TGI200 in Germany (Sundrum, 2001) for organic farms or specific tools for dairy cows as in France (Capdeville and Veissier, 2001) and in Italy (Tosi *et al.*, 2001) or for buffaloes (De Rosa *et al.*, 2005). Most of these systems are largely based on environmental observations, i.e., design or resource measures presumed to affect animal welfare. However, the links between specific measures and the animals’ welfare status are not always clearly understood (Blokhuis *et al.*, 2006). The resource-based and management-based measures are more risk factors that might affect welfare than direct measures of it, as they are not directly related to it. Therefore, in order to assess animal welfare at farm level, it is very important to develop animal-based measures that are based on measuring the actual welfare state of the ani-

mals in terms of their behaviour, health, physiology (Blokhuis *et al.*, 2006). The search for valid and reliable indicators is an important objective of much welfare research especially for assessing welfare at farm level.

Welfare Quality® is an EU funded project about integration of animal welfare in the food quality chain: from public concern to improved welfare and transparent quality. This project aims to accommodate societal concerns and market demands, to develop reliable on-farm monitoring systems, product information systems, and practical species-specific strategies to improve animal welfare. More than forty institutes and universities (representing thirteen European and four Latino American countries) with specialist expertise participate in this integrated research project. The project is organized in 10 sub-projects and started in May 2004, it will end in 2009. Italian researchers from University of Milan, Naples, Padua, Parma and Pisa are involved in different tasks of this project. In order to develop a monitoring system for the welfare assessment at farm levels researchers of the sub-project two of Welfare Quality® defined four animal principles: good housing, good feeding, good health and appropriate behaviour. Within these principles 12 distinct animal welfare criteria were identified (Keeling and Veisier, 2005). For different farm species the researchers identified around 30 to 50 animal-based measures that could compliance with the twelve defined animal welfare criteria for farms and slaughterhouse. Then the researchers run different experiments in order to check the validity, repeatability and on-farm feasibility of many of the animal-based measures identified. The researchers of the Animal Science Department of the Veterinary Faculty of Milan were involved in the process of investigate on farm repeatability and feasibility of agonistic, and positive behaviours such as social licking or allogrooming, resting and abnormal behaviours in dairy cows together with German and Austrian partners (Laister *et al.*, 2007). The researchers of the Animal Science Department of the Veterinary Faculty of Milan together with English partners worked on the standardisation of some signs of health status in cattle regarding, among other, respiratory, enteric and reproductive problems. These measures are valid but data are sometime recorded on routine basis, yet may not be readily available, or may be recorded in variable formats. All the research done allowed to choose and insert in the prototype scheme the most feasible and valid animal-based measures (Table 1) together with sampling standardization. The measures are a combination of animal-based, resource-based and management-based measures. The prototypes of monitoring systems based on validated, reliable measures have been tested on more than 700 cattle, pigs and poultry farms across nine European countries. Practical assessment systems developed in the Welfare Quality projects measure each of the 12 welfare criteria in seven livestock species: dairy cattle, beef cattle, veal calves, sows, fattening pigs, laying hens and broilers As an example in Table 1 is reported the final prototype scheme for dairy cows which was tested in more than 90 dairy farms in different European countries. Moreover addition information was collect during the farm visit regarding management choices and structures characteristics. The researchers of the Animal Science Department of the Veterinary Faculty of Milan tested the prototype in 25 dairy farms with different structures (deep litter or cubicles) and herd size. Table 1, however, does not show the final monitoring system since collected data deriving form on farm visits will be analysed and the measures further refined. The data collected at farm level will be integrated into a single overall assessment

Table 1. List of the measures that are currently part of the full monitoring system for dairy cows (Winckler *et al.*, 2007).

		Welfare Criteria	Measures (all on farm)
Good feeding	1	Absence of prolonged hunger	Body condition score (percentage of too fat/too thin animals)
	2	Absence of prolonged thirst	Water supply (number of water bowls, flow rate, cleanliness, functioning of bowls)
Good housing	3	Cleanliness	Cleanliness scores (udder, flank and upper legs, lower legs)
	4	Behaviours around resting	Time needed to lie down Percentage of animals colliding with housing equipment during lying down Percentage of animals lying with hindquarter on edge
	5	Ease of movement	Presence of tethering Access to outdoor loafing area and/or pasture
Good health	6	Absence of injuries	Lameness score (lameness prevalence) Integument alterations (hairless patches, lesions/swellings, overgrown claws)
	7	Absence of disease	Respiratory disorders (coughing, sneezing, nasal discharge, ocular discharge, increased respiratory rate) Enteric disorders (diarrhoea) Reproductive disorders (milk somatic cell count, vulvar discharge) Other parameters (mortality, culling rate)
Appropriate behaviour	8	Absence of pain induced by management procedures	Routine mutilations (dehorning, tail docking; procedure, age, use of anaesthetics/ analgesics)
	9	Expression of social behaviour	Incidence of agonistic behaviours
	10	Expression of other behaviours	Qualitative behaviour assessment
	11	Good human-animal relationship	Avoidance distance at the feeding place Avoidance distance in the home pen

of animal welfare using the methods developed in multicriteria decision theory (Botreau *et al.*, 2007).

The final steps in Quality® project is to bring practical animal welfare guidelines and assessment systems to Europe's farms and slaughterhouse.

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