

Development of a new approach to evaluate buffalo welfare, the Ruminant Welfare[®] project

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Abstract

Animal welfare is a growing, compelling and urgent topic because of the interest that it generates among the citizens and consumers. The goal to be fulfilled is to define systems and protocols for assessing animal welfare that should be impartial, reproducible and science-based on risk analysis. On these premises, the Italian Ministry of Health has signed an agreement with the IZSLER, through the CReNBA and IZSM through the CReNBuf on development and management of a system to evaluation of welfare and biosecurity in buffaloes breeding system. The checklist development was based on the Risk Assessment Methodology as suggested by EFSA. Building on the CReNBA's work developed on the welfare dairy cow, this method is based on the analysis of two data groups: The assessment of the hazards (non-ABMs) occurring as a result of environmental conditions; the assessment of the risks, with the concerned adverse effects (ABMs), run by animals living in those environments. The system developed consists in 83 observations, listed in a multiple-choice checklist divided in five macro-areas: Farm management and personnel, Facilities and equipment, Animal based measures, Biosecurity and Alarm systems. The result of each area also provides an indication of the burden and importance of each of these on the final calculation of the animal welfare value. These checks represent a functional and smart instrument to allow assign a numerical animal welfare index to each farm. In addition, by the data collected in each area, to supply at the Veterinarians and breeders the tools to improve farm management and structures, respecting the farm's sustainability, and is preparatory to given to the development of a Ministerial trademark for animal welfare, giving answers to consumers and add value to the correct activities of the farmers.

Introduction

Animal welfare is a growing. Compelling and urgent topic because of the considerable interest that it generates among the citizens and consumers and by the great attention, the media has given to it. Specifically, in the wake of the major health emergencies of recent years, consumers focus on the quality and healthiness of animal products, and on the sustainability and ethics of the products, especially those sourced from intensive farming. Livestock production and together with the way of life of farmers has evolved: It is therefore no longer objectively acceptable to breed animals in unsuitable conditions. The dual role of Veterinarians

should be taken into consideration in this context. On the one hand, they must ensure the welfare of animals and put a stop to farming them in conditions of suffering; on the other, but in no way in contrast, they have to safeguard food safety and public health. The consumer has firmly demanded farm animal welfare but it cannot actually come about if that clashes with the economic sustainability of the farm. To achieve this goal, it is important to inform chain operators about the positive consequences of improving animal welfare, as it is able to increase the income from the farm. With a bid to protect the environment and animals, the greatest error would be to achieve the set goal by fearfully abiding by regulatory duties only.

The goal to be fulfilled must be to define systems and protocols for assessing animal welfare that should be impartial, reproducible and science-based on risk analysis. Based on these premises, the Italian Ministry of Health has signed an agreement with the Istituto Zooprofilattico Sperimentale della Lombardia e dell'Emilia Romagna (IZSLER), through the Italian National Animal Welfare Reference Centre (CRENBA) on development and management of a system to evaluation of welfare and biosecurity in different cattle, buffaloes, sheep and goats breeding system (cup:E52I14001190001). In the project named "Ruminant welfare[®]", the CRENBA, as leader unit, involved different operating units and in particular the Istituto Zooprofilattico Sperimentale del Mezzogiorno (IZSM) through National Reference Centre on Water Buffalo Farming and Productions Hygiene and Technologies (CRENBuf) for the development of a scheme for assessing welfare and biosecurity in buffaloes' breeding. The result of the fulfilment of the evaluation system is to assign a numerical animal welfare index to each farm. The index will be obtained from adding up the assessments deriving from the responses for each single item and weighed in relation to the importance that each of these has in defining the state of welfare.

Risk assessment methodology in animal welfare

The method chosen for the development of the project was the Risk Assessment Methodology in Animal Welfare as suggested by European Food Safety Authority (EFSA). Building on the CRENBA's work developed on the welfare dairy cow (Bertocchi and Fusi, 2014), Guidance on Risk Assessment for Animal Welfare of European Food Safety Authority (EFSA, 2012), European Welfare Quality[®] in buffalo (De Rosa *et al.*, 2015) minimum regulatory provisions, bibliography, and the support of the expert group, the activity of the CRENBuf started in march 2015. Differently from previous other systems of animal welfare evaluation—based only on non-animal based measures (non-ABMs or in others cases just on Animal Based Measures (ABMs)—, this method is based on the analysis of two data groups: The first group consists in the assessment of the hazards (non-ABMs) occurring as a result of environmental conditions; and the second group consists in the assessment of the risks, with the concerned adverse effects (ABMs), run by animals living in those environments. More in detail, the route

utilized to evaluate risk assessment on animal welfare are: 1) Identification of the target population, 2) hazard identification (non-ABMs), 3) identification of the hazard threshold level, 4) identification of the adverse effects (ABMs), 5) Measurement of adverse effects, 6) evaluation of the hazard magnitude, 7) evaluation of adverse effect magnitude, 8) Apply the checklist complete in a significant number of pilot farms, 9) formulate an explicative disciplinary for the checklist, 10) assess the data repeatability by statistical analysis, 11) implementation of the checklist on digital media, 12) organization of training courses for evaluators.

Results

Based on the experience developed in the dairy cow from CRENBA, on the specific scientific literature on breeding buffalo, on individual experiences made by the expert board members, and on 87 farm's visits undertaken in the period May-September 2015 by the staff of the CRENBUF, the target population has been pinpoint with buffaloes farmed in loose housing systems with the subgroups lactation, dry period, heifers, and calves as expositive scenario. Furthermore, the consequences of hazards on animals and threshold levels are able to report positive and negative changes in health conditions, such consequences are expressed as animal based measures (ABM) have been identified. The system developed consists in 83 observations (items), listed in a multiple-choice checklist.

Each item assessment is divided into three overall choice option, divided for two thresholds, distinguished as "unacceptable", "acceptable", and "excellent". In borderline situations, the Veterinarian performing the assessment must always bear in mind that the worst condition (unacceptable) and the best condition (excellent) should be assigned, respectively, in cases where there is clear negative evidence and clear positive evidence only. Each item of information is obtained from one or more performing the following actions: a) Questions on the main management activities to be asked to the farm manager, b) Assessing the facilities and equipment used in the barn (Non-ABMs), and c) Observing the animals and detecting body condition and behavior-related welfare indicators (ABMs). As for the hazard, evaluation is performed using parameters divided into two macro-areas: Area A (23 items) "Farm management and personnel"; Area B (29 items) "Facilities and equipment" and identifying

their respective thresholds. Animal-based measures are assessment in Area C in 14 points. The partial result of each area also provides an indication of the burden and importance of each of these on the final calculation of the animal welfare value. The hazard analysis areas assess the farming and management conditions of the farms, but these may have different effects as they are regulated by the animals ability to adapt and are therefore less important when establishing the final welfare value. Finally, the buffaloes farming welfare assessment system will be integrated with parameters for analyzing conditions of biosecurity (Area E) and inspection of alarm systems (Area D). Although the final value of the welfare and biosecurity index of the farm can be managed at will, it is advisable to classify the farms in relation to the welfare risk in three different levels reflecting the requirements of the single observations, to make it easier to understand: 1) Farm with inadequate welfare or biosecurity conditions, in cases where the final score is in the lowest 33% with respect to the available score, 2) Farm with good welfare or biosecurity conditions, in cases where the final score is between 33% and 66% with respect to the available score, 3) Farm with an excellent level of welfare or biosecurity: In cases where the final score is between 66% and the maximum available score.

Besides simply breaking down the farms into categories, the system also identifies farms which do not comply with legal requirements: Non-conforming farms (failure to comply with legal requirements) As the final result, a welfare certificate will be presented, containing the following: 1) The list of shortfalls identified (only in the case of farms having legislative non-compliance), 2) The numerical index and the relative welfare assessment level for each of the areas, 3) The overall welfare level value at the farm, and 4) The standard of biosecurity at the farm (Area E). Starting to 10/05/16, after the firsts revision operated in accord with CRENBA, the Checklist rev.3., was applied in 11 buffalo farms distributed in six Italian regions, to verify the functionality of the instrument. The compilation of the checklist has been carried out on average in 140 min. The evaluated herds have presented an average total number of 582 heads, with a minimum of 130 and a maximum of 1,152

animals present. The average overall welfare value (0-100% average recorded score) was 74.47%, while that for Area A 70.29%, Area B 73.97%, Area C 81.65%, the Biosafety 44.17% on 48.11% and large risks. It has been detected legislative irregularity in the 18.86% of companies.

Conclusion

This checklist developed by the collaboration between CRENBA and CRENBuf on the request of Italian Ministry of Health, represent an impartial, reproducible, functional and smart instrument based on risk analysis to allow assign a numerical animal welfare index to each farm, and also, by the data collected in each area, to supply at the Veterinarians and breeders the tools to improve farm management and structures, respecting the farm's sustainability. The usage of this tool will allow to have a uniform assessment of the level of welfare of buffalo farms, and is preparatory to given to the development of trademark for animal welfare, giving answers to consumers and add value to the correct activities of the farmers who respect the parameters of well-being.

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