



OWC 2020 Paper Submission - Science Forum

Topic 2 - Product and process quality in Organic Agriculture: methods and challenges

OWC2020-SCI-288

PUBLIC BENEFITS OF ORGANIC LIVESTOCK FARMING AS FOR ASPECTS OF ANIMAL WELFARE COMPARED TO CONVENTIONAL AGRICULTURE - RESULTS OF A SYSTEMATIC LITERATURE REVIEW -

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Preferred Presentation Method: Oral or poster presentation

Full Paper Publication: Yes

Abstract: Organic farming is widely regarded as an animal-friendly husbandry with benefits for animal health. However, there is only little information available on the situation in real life: is organic agriculture more welfare-friendly than its conventional counterpart?? Our systematic literature review showed that organic farming has potential to achieve good welfare states (e.g. regarding lameness). Moreover it may not be beneficial if it coincides with less than optimal management (e.g. regarding pasture parasites). Outcome-based assessments should therefore be implemented in organic standards in order to consider and safeguard the health-related aspects of animal welfare.

Introduction: Animal welfare is a central target of organic agriculture and anchored in the IFOAM Principles (IFOAM 2014). These principles are also reflected in the production regulations for organic farming ((EC) No 834/2007, (EC) No 889/2008). The central concern is to maintain and promote animal health and welfare through preventive measures. There are only a few systematic reviews available that consider a comparative assessment of animal welfare with regard to the differences between conventional and organic farming (Sundrum 2001, Hovi et al. 2003, Lund & Algers 2003). More currently, only Van Wagenberg et al. (2017) published a literature review.

The aim of the present study is to carry out a current comparative assessment of the animal welfare status of farm animals, differentiating between conventional and organic farms, based on a comprehensive analysis of scientific publications. Thereby we want to describe the public benefits of organic animal husbandry in relation to animal welfare.

Material and methods: The benefits of organic livestock farming in relation to animal welfare can be measured and evaluated – using a variety of indicators and considering comparative scientific studies. According to David Fraser (2008), animal welfare is a multidimensional concept comprising health ("basic health and functioning"), behaviour ("natural living") and the emotional state of an animal ("affective states").

In addition to an analysis of the production regulations of the EU Organic Regulation, a systematic literature search was carried out. Thereby comparative studies could be identified which dealt with indicators for animal welfare. As comparative studies, those publications were recorded which present animal welfare indicators of livestock on organic and

conventional farms in a comparative way. The comparison pair was understood to be the organic and conventional variants (related to farm or herd), which were compared in one publication with regard to one indicator.

In the present study a comprehensive systematic literature analysis was carried out with the help of various databases between April 2017 and March 2018. Organic and conventional livestock husbandry was compared at the level of individual indicators as used in the comparative studies. We took into account peer reviewed studies between 1990 and March 2017. In addition, we considered the database of Organic Eprints and i.e. (project) reports as well as conference contributions in individual cases (in English or German language). We evaluated the found comparisons according to the respective statements of the publications (+/-). Since a comparative study may include several species or production types, the number of studies used for data extraction does not correspond to the total number of comparative studies. If several indicators were compared in one study, this results in several comparison pairs per study. Most of the 67 comparative studies considered in the review examined individual aspects of animal welfare in cattle (51 publications); 8 dealt with pigs, 6 with poultry and 5 with small ruminants (including one with goats).

Results: The majority of the studies deal with dairy cows as the economically most relevant livestock species. Across all livestock species the results did not provide a clear picture if organic is more welfare-friendly than conventional husbandry. No substantial differences were found between organic and conventional livestock in 46 % of the comparison pairs. The organic management showed advantages in 35 % of the pairs, whereas the conventional version performed better in 19 % of the pairs. Only a few studies take into account animal welfare by more comprehensive evaluations. The existing studies indicate animal behaviour and emotional state benefits of organic livestock husbandry, e.g., due to greater space allowance or access to pasture. Animal health was not substantially different, except lameness and leg injuries. This indicates that the impact of farm-individual management is much higher than the farming method. In conclusion, the literature review showed that organic farming has potential to achieve good welfare states (e.g. regarding lameness prevalence and leg health). Table 1 summarises the identified comparisons of the different animal species and production directions as well as the three dimensions of animal welfare (animal health, behaviour and emotions).

Even 17 or rather 15 years after Sundrum (2001), Hovi et al. (2003) and Lund & Algers (2003) have published their studies, recently only a few more comparative studies could be identified that deal with the further dimensions of animal welfare in addition to animal health. In accordance to the mentioned reviews, no clear picture was drawn regarding animal welfare, taking into account all welfare indicators and animal species.

In terms of behaviour and emotions, the few available studies indicate advantages of organic livestock farming. As far as animal health is concerned, there are no substantial differences between the two methods of farming; in this respect, management seems to be more decisive than the farming method.

Organic livestock farming performs better if the main risk factors for animal health problems are addressed within the EU Organic Regulations. Thus, e.g., the requirements for litter and space have a positive effect on the lameness prevalence and leg health. In other areas, however, organic farming harbours additional risks: e.g., offering free range areas outdoor and pasture mean a higher risk of parasite contamination. However, in some health areas there hasn't been found a difference between organic and conventional systems, but beyond that, this comparable level of animal health is achieved with significantly lower use of veterinary medicines (e.g. udder health). Van Wagenberg et al. (2017) come to a similar conclusion in their literature review: In general, the comparison of these farming methods with regard to animal welfare shows hardly any differences, although organic farming is rated better than conventional farming in individual aspects.

Discussion: Nevertheless, together with less than optimal management (e.g. regarding udder health) it may not be beneficial.

The results of our literature review show that the EU regulation on organic farming (with its minimum standards for husbandry and management that go beyond the legal requirements) offers great potential for good animal welfare, but in its current purely action-oriented form it does not represent a guarantee. Only a combination of action-oriented specifications and a results-oriented approach (consideration of animal-based indicators) can address all dimensions of animal welfare - health, behaviour and emotions. Therefore outcome-based assessments should be implemented in organic standards in order to consider and safeguard the health-related aspects of animal welfare.

Acknowledgment

We thank BMEL / BLE for financing project 15OE009. We cordially thank Prof. Dr. Knierim, Dr. Ebinghaus for advice and the project team, especially Dr. Jürn Sanders, who coordinated the project.

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Image:

Table 1a: Number of studies, number of comparative pairs and percentage distribution of all pair comparisons from the comparative studies into the groups +/=/- to the indicators of the three animal welfare dimensions

| Species/ type of prod. | Dimensions of <i>Animal Welfare</i> | Numbers | | Percentage of pair comparisons (%), to which (number in total number significant): | | |
|--|--|---|----------------------|--|--------------------|-----------------------|
| | | studies | comparative pairs | Organic + | Organic = | Organic - |
| dairy cows | health | 46 | 286 | 38 (110/76) | 46 (131) | 16 (45/31) |
| | behaviour | 3 | 10 | 20 (2/2) | 60 (6) | 20 (2/2) |
| | affective state | 1 | 3 | 67 (2/2) | 33 (1) | 0 (0/0) |
| weaning calves | health | 5 | 6 | 14 (1/1) | 57 (4) | 29 (1/1) |
| | behaviour | - | - | - | - | - |
| | affective state | 1 | 1 | 0 (0/0) | 100 (1) | 0 (0/0) |
| fattening- and slaughter cattle | health | 2 (fattening & slaughter cattle) 1 (suckler cows & calves) | 35 14 | 23 (8/5) 29 (4/4) | 40 (14) 71 (10) | 37 (13/10) 0 (0/0) |
| | | - | - | - | - | - |
| | behaviour | - | - | - | - | - |
| | affective state | - | - | - | - | - |

Image 2:

Table 1b: Continuation of table 1a

| Species/ type of prod. | Dimensions of Animal Welfare | Numbers | | Percentage of pair comparisons (%), to which (number in total number significant): | | |
|------------------------------|------------------------------------|-------------------------|----------------------|--|----------------------|---------------------|
| | | studies | comparative pairs | Organic + | Organic = | Organic - |
| pigs | health | 8 | 51 | 32 (16/6) | 43 (22) | 25 (13/9) |
| | behaviour | 2 | 2 | 50 (1/1) | 50 (1) | 0 (0/0) |
| | affective state | - | - | - | - | - |
| poultry | health | 6 | 28 | 29 (8/4) | 36 (10) | 36 (10/3) |
| | behaviour | 2 | 4 | 100 (4/0) | 0 (0) | 0 (0/0) |
| | affective state | 3 | 5 | 60 (3/0) | 20 (1) | 20 (1/0) |
| small ruminants | health | 4 (sheeps) 1 (goats) | 25 3 | 24 (6/1) 0 (0/0) | 56 (14) 100 (3/0) | 20 (5/3) 0 (0/0) |
| | behaviour | - | - | - | - | - |
| | affective state | - | - | - | - | - |

Explanation:

Organic + : Organic farms show advantages and better values than conventional farms.

Organic = : Organic farms are not different from conventional farms.

Organic - : Organic farms have worse values than conventional farms.

The studies partly deal with several animal welfare areas and indicators; comparative pairs.

Disclosure of Interest: None Declared

Keywords: Animal health, Animal welfare, literature review, organic livestock farming, regulations