



Improving animal health and welfare in organic cattle milk production through breeding and management (OrganicDairyHealth; period 2015-2018)

Results of subprojects with German participation and recommendations for practitioners

FACT SHEET

The focus of this European project with partners from 7 countries (AT, CH, DK, DE, LI, PL, SE) was the improvement of udder and metabolic health in organic dairy farms. Germany participated in the following sub-projects:

- 1) Characterization and evaluation of health and production traits in local/native dairy cattle breeds with reference to commercial breeds
- 2) Identification and description of major organic dairy farm types in Europe, with emphasis on management and herd health
- 3) Identification of effects of human-animal relationship, stress and management on udder health
- 4) Evaluation of farmers' experiences regarding voluntary drying off single udder quarters as a potential alternative to the use of antibiotics in cases of mild chronic mastitis.

Background

Good animal health and a high level of well-being are central aims of organic animal husbandry, which should preferably be achieved by preventive measures. In order to be able to minimize antibiotic and other veterinary treatments in dairy cows, on the one hand the selection of suitable breeds or cow types is important, on the other hand an adapted management is required, which inter alia aims at maximizing behavioural freedom and minimizing stress loads.

1 Comparison of breeds

In Germany (DE), the local Original Red Angler Cattle breed (Angler Rind alter Zuchtichtung, AAZ) was compared with the commercial breed Holstein (HO) in terms of health and performance. All 340 AAZ cows on six organic farms with available milk recording data (MRD) for 2015 were evaluated. The control group of 13 organic farms with 690 HO cows had low input farm characteristics and management comparable to the native breed farms to minimize confounding with environmental effects on health and performance.

The health status (here regarding somatic cell counts, metabolic risks

based on fat-protein quotients, fertility indicators, as well as the frequency of veterinary treatments) was on a similar level for AAZ as well as HO cows. In terms of milk yield, AAZ were only slightly, but not significantly inferior. Fat and protein levels were significantly higher in AAZ than HO cows, although not in absolute yields.

Therefore, under the studied extensive, roughage-based management conditions on organic farms, AAZ can compete with HO cows in terms of health and milk production, although they are a very small population.



Fig. 1: In Germany, Original Red Angler cows were compared with Holstein cows under similar farm and management conditions

Breeds in the partner countries were mainly compared independently of the farm type, but in the countries' entire breed populations kept under organic conditions. The results are heterogeneous. Milk yields were mostly lower in the local breeds, but especially the local breeds Grey Cattle and Original Braunvieh in CH and AU were partly superior in terms of health in comparison to the commercial breed Braunvieh.

2 Organic dairy cattle farm types

The conditions under which organic dairy cows are kept in Europe vary widely both within and between countries. A total of 22 organic dairy farm types were identified in all seven countries, based on herd size, milk yield, housing system and region. A description of the herd and management characteristics of about 40 farms in DE showed that the four types of farms identified also differed significantly in terms of feeding strategy, feeding intensity and health prevention measures.

However, the herd health situation was comparable, although especially udder health was generally in need of improvement. This demonstrates that similar results can be reached by different pathways.

Table 1: Organic dairy farm types in Germany, based on a cluster analysis of a representative sample of 204 farms and expert opinions

major organic farm types	cows	milk [kg]	typical region ^a	typical housing system
A: medium-scale herds, low - medium milk yield	36-70	<7000	4, 5	cubicles and straw yards
B: small-scale herds, low milk yield	≤35	<5900	1, 2, 3	straw yards
C: large-scale herds, high milk yield	>70	>7000	1, 2	cubicles
D: medium scale, South German herds, medium milk yield	36-70	5900 - 7000	only 3	cubicles

^a 1 = Schleswig-Holstein, Lower Saxony, Hamburg; 2 = NRW, Hesse, Rhineland-Palatinate, Saarland; 3 = Bavaria, Baden-Württemberg; 4 = Mecklenburg-Western Pomerania, Brandenburg; 5 = Saxony, Thuringia, Saxony-Anhalt

3 Human-animal relationship, stress and udder health

This topic has been studied in DE on 25 and in Denmark (DK) on 5 organic dairy farms with predominantly Holstein cows. The behaviour of animals and humans (in the barn and during milking) were analysed and farmer's attitudes and information about animal-related management gathered by questionnaires. Stress hormones (cortisol metabolites) were repeatedly measured in faecal samples. Udder health indicators were calculated from quarter milk samples: prevalence of healthy quarters (<100,000 cells/ml milk) and mastitis quarters (bacteriological findings plus ≥100,000 cells/ml). Additionally, milk recording data over one year were analysed retrospectively for average somatic cell score (SCS), percentage of elevated composite somatic cell counts (SCC) and mastitis self-cure rate. For the latter, the course of the cows' individual SCC within a lactation was evaluated, calculated as the percentage (on herd level) of changes from a SCC of more than 200,000 cells/ml to three consecutive test day SCCs under 100,000 cells/ml from all initial test day results with ≥ 200,000 cells/ml within one year. Curing after antibiotic treatment during lactation was not counted as self-cured.

Recommendations for farmers and advisors

- Under extensive, roughage-based conditions on organic dairy farms, the local Original Red Angler Cattle breed can compete with Holstein cows in terms of health and performance.
- The diversity of conditions and aims of different types of farms should be taken into account in counselling. Different feeding intensities and management strategies can lead to a similar herd health status.
- Consider human-animal relationship as mastitis risk factor, look critically at one's own handling with cows, enable positive contact with the animal during routine work, minimize stress, and do not neglect the hygiene of milking and housing.
- Premature drying off individual quarters during lactation may be a strategy to reduce antibiotic use in cases of chronic subclinical or mild clinical mastitis. However, careful observation and, if necessary, re-milking of the quarter are essential.

Not all identified risk factors were related to all udder health indicators, but a consistent pattern emerged. While keeping in mind that causes of mastitis may vary according to farm-specific conditions and pathogens involved, the following general recommendations can be derived:

- Animal-friendly attitudes are worthwhile: we found correlations between better udder health and farmers' agreements to patient moving and positive contact with the animal.
- Positive contacts should deliberately be integrated in the daily work. Farms with a higher quality and quantity of contacts had better udder health and curing rates.
- Barn controls beyond routine work and a stable milking situation with little change in the weekly routine proved to be beneficial as well.
- An overall low stress load of cows is highly desirable, as this can increase the mastitis self-curing rate.
- We confirmed already known housing and management effects: During milking, it is advisable to fore-strip before cleaning and to use fresh cleaning material for each cow. After milking, fixing the cows in the feeding rack can reduce udder infections. Straw yard lying areas can lead to a poorer herd health in comparison to deep-bedded cubicles, certainly due to the higher risk for dirty udders.

4 Voluntary single udder quarter drying off

According to experiences of organic farmers in DE and DK, voluntary drying off single quarters during lactation may in certain cases be a successful strategy to deal with chronic subclinical or mild clinical mastitis and to save antibiotic treatments with poor healing prospects. Pathogens and previous damage of the quarter tissue determine whether the inflammation may heal and whether the quarter can be milked again in the next lactation. However, for severe and acute clinical mastitis the procedure is not suitable. Especially during the first few days after quarter dry-off, the quarter must be observed very carefully due to an increased risk of inflammation. At the first signs of inflammation such as increase of temperature, redness, swelling or pain the quarter must be emptied again until the symptoms of inflammation have subsided. Then it is possible trying again to dry-off the quarter.

Project partners

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A detailed description of the project results can be found under <https://service.ble.de/ptdb>, www.orgprints.org, Project number 2814OE003

Imprint

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