

## Improving animal health and welfare in organic cattle milk production through breeding and management - Recommendations on optimal breeding strategies and best management practices

### INTRODUCTION

Good animal health is a cornerstone of organic livestock production with vital importance for productivity and economy as well as for animal welfare and antibiotic resistance risk in human and veterinary medicine. Organic cattle milk production is the largest and by far the economically most important organic livestock production in Europe. OrganicDairyHealth, a European research project, has focused on dairy cow health through a combined improvement of management and breeding.

Main topics are:

- Best use of local/native breeds
- Optimal breeding strategies
- Best handling of cow to avoid mastitis
- Best handling of mastitis without use of antibiotics
- Best pasture management with minimum metabolic and udder health problems

On the following pages you find recommendations on how to optimize animal breeding and best management practices for improving animal health in organic dairy milk production.



## BEST USE OF LOCAL/NATIVE BREEDS

Local/native breeds are indirectly or explicitly recommended in organic standards but little knowledge is available regarding the suitability of native breeds under organic conditions.

Results from the project show that local breeds have advantages with regard to many functional traits studied and that their potential should be better exploited in future, especially on farms with a medium production level.

The following country-specific conclusions and recommendations regarding the use of local breeds can be derived from our breed comparisons:

- **Austria:** The local breed Gray Cattle (AL) had a lower productivity but showed best fertility performance in all traits investigated along with lower somatic cell count level. AL can be regarded as a good choice for rough environments or low input strategies where lower production levels are adequate. Fat content of this breed should be improved by selection.
- **Switzerland:** The local breed Original Braunvieh (OB) demonstrated advantages regarding udder health (SCC), fertility and persistency, although with lower milk yield. The protein content of this breed needs further attention. We recommend this breed for organic production under moderate production intensities.
- **Poland:** The local breed Polish Red showed outstanding milk content traits and longevity, but needs improvement regarding production level and udder health. All Polish local breeds showed very high SCC levels from which we deduct the need to raise awareness for those problems (also on fertility) and a need to improve overall management practices. We further recommend a consequent choice of breeding animals within the rather small populations in order to better exploit the strengths of the local breeds in Poland.
- **Sweden:** Swedish Red (SRB) can be recommended for organic farms due to their better performance regarding milk content, fertility traits, somatic cell count, longevity and number of veterinary treatments. The tradeoff regarding milk yield in comparison with Swedish Holstein is well acceptable under low input conditions. When studied under similar farm conditions Swedish Polled (SKB) and Swedish Red (SRB), both can be recommended compared to Swedish Holstein if less milk yield is accepted, as they proofed to have better milk content, partly better fertility performance, but only SRB was superior when it came to total number of veterinary treatments. Managed under similar farm conditions no breed differences regarding somatic cell count could be found.
- **Germany:** Under similar farm type management conditions the local breed Original Red Angler Cattle (AAZ) showed a comparable production level and significantly higher milk contents and is therefore recommended for the selected farm type. Overall SCC level was comparably high in both breeds indicating at a potential for management improvement regardless of the breed.

## OPTIMAL BREEDING STRATEGIES

The aims concerning organic animal breeding in EU Regulation 834/2007 (CEC 2007) include that the animals should be born and raised on organic farms. Prevention of livestock disease should mainly be obtained by selection of suitable breeds and by good management practices. The development of sustainable breeding strategies for organic animal production should involve identification of traits especially important in organic production environments, and suitable ways to combine these traits in breeding goals. This development also needs to take suitable strategies for cross breeding into account. The simulation studies performed in the OrganicDairyHealth project indicate that:

- Breeding goals reflecting the principles of organic farming result in improvement in functional and health traits, with maintained levels of production traits
- Including preferences of organic Danish dairy farmers increased weights on production traits in the breeding goal simulations, but this had little effect on simulated genetic gain
- Under Swedish organic production conditions, terminal and rotational crossbreeding of dairy breeds (Holstein and Swedish red) lead to increased contribution margin compared to a pure bred Swedish Red and a pure bred Holstein breeding strategy
- Under Swedish organic production conditions, terminal crossing including a native breed (Swedish Polled) as a purebred nucleus crossed with a high producing breed (Holstein or Swedish Red) can be a strategy to conserve a native purebred whilst increasing the contribution in the herd.



**Photo:**

*(Schweizer Original Braunvieh)  
Terminal crossing including a  
native breed can be a strategy to  
conserve a native pure breed  
whilst increasing the contribution  
in the herd.*



Mastitis is responsible for a major part of the antibiotics still used, also in European organic dairy production and stress is an important risk factor.

- Consider human –animal relationship as a mastitis risk factor
- Look critical at one's own handling of cows
- Enable positive contact with the animals during routine work
- Minimize animals' stress. An overall low stress load of cows is highly desirable, as this can increase the mastitis self-curing rate
- Do not neglect the hygiene of milking and housing: 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.



**Photo:** (avoidance distance test) Consider the human-animal relationship as a mastitis risk factor.

## BEST HANDLING OF MASTITIS WITHOUT USE OF ANTIBIOTICS

New milking techniques such as robot milking provide possibilities for individual handling of cows at milking and to dry off questers without extra time for milking.

- Individual quarter dry-off in management of subclinical mastitis may be a strategy to reduce antibiotic use through reduced spreading of pathogens within the herd
- Careful selection of cows and accurate and thorough surveillance is necessary to avoid unnecessary pain for the cow
- Gradual quarter dry-off with one or two milkings of the quarter in the week following dry-off is not superior to abrupt quarter dry-off
- Economically, this strategy is very sensitive to milk price, milk yield, and mastitis level, and it is only favourable if milk yield or milk price is very high.



**Photo:** Individual quarter dry-off of subclinical mastitis may be a strategy to reduce antibiotic use.



## **BEST PASTURE MANAGEMENT WITH MINIMUM METABOLIC AND UDDER HEALTH PROBLEMS**

Well managed grazing allows the cows to be high yielding at a low concentrate level. However, grazing is also seen as a major challenge for providing a constant and high level of good quality feed.

- Grazing provide the cows with good possibilities for performing natural species specific behavior
- In high yielding dairy cows, grazing alone is not sufficient to maintain the high performance. However, combined with TMR and/or concentrate feeding the energy intake can be raised and the production only mildly affected. Then, the production loss are less economically relevant as the energy intake obtained by grazing are much cheaper than processed feedstuff
- Grazing can be managed without effect on metabolic diseases by providing a good grazing management strategy. This also includes special focus on providing the adequate minerals to the dry cows in order to balance the low Mg and high Ca and K in the pasture-based feeding
- The risk of elevated somatic cell count and subclinical mastitis is higher in the grazing season. This can be related to climatic stressors (high temperatures, humidity, sudden changes in temperatures). It is therefore necessary to observe changes in somatic cell counts and have increased attention on signs for mastitis. Also, providing cows with adequate shelter for sun and heat as well as rain and cold is essential
- In countries where summer grazing is much cheaper than winterfeed (Lithuania Germany, Sweden), a prolongation of the grazing season or number of grazing hours per day is economically favorable (if it is feasible) even though grazing leads to a minor loss in ECM (fat content drops). In the Alp countries, the grazing season is already very long and seems optimized.



## About OrganicDairyHealth

OrganicDairyHealth was a three year research project focusing on improving organic dairy cow health through a combined improvement of management and breeding and conducted in six countries (Denmark, Sweden, Germany, Lithuania, Poland, Switzerland, Austria).

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Visit the website of OrganicDairyHealth: <https://bit.ly/2ymgixM>

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