

# SOLID News



NEWSLETTER OF THE SOLID PROJECT ● 2012 ● 1<sup>ST</sup> ISSUE



## CONTENTS

Welcome to the first SOLID newsletter by the project manager.....2

### Activities & Preliminary results

- Farms in Austria - a description (WP1).....3
- Assessing whole farm sustainability (WP1).....4
- Cattle and goat breeds adapted to organic and low input dairy production systems: Facts versus fiction (WP2).....6
- Novel and underutilized feed resources - potential for use in organic and low input dairy production (WP3).....7

Brief News & Events.....10



## ABOUT THE SOLID PROJECT

SOLID is a European project on Sustainable Organic and Low Input Dairy-ing financed by the European Union. The project runs from 2011-2016.

25 partners from 10 European countries participate in the project.



# Welcome by the project manager

Welcome to the first edition of SOLID News!

This newsletter is designed to keep you informed about the innovative research and dissemination activities of the European FP7 funded SOLID Project.

The projects objectives are to improve the technical and economic performance of low input and organic dairy systems whilst at the same time maximising their potential to deliver environmental benefits. There is a diverse team of 25 research institutes and dairy businesses from across 11 European countries and there will be a range of events and workshops taking place that we will keep you informed of both through this newsletter

and on our project website ([www.solidairy.eu](http://www.solidairy.eu)).

We would welcome communication with other researchers and dairy industry participants on any activities taking place in the organic and low input dairy sectors that could facilitate cross pollination of ideas.

If you would like to contact us please do so via our SOLID Project Manager ([pkn@aber.ac.uk](mailto:pkn@aber.ac.uk)).



*Pip Nicholas,  
SOLID project manager*



## About SOLID

The objective of SOLID is to support developments and innovations in organic and low input dairy systems to optimise competitiveness for a sustainable and profitable dairy industry in Europe.

### Workpackage titles

Innovation through stakeholder engagement and participatory research	WP 1
Adapted breeds for productivity, quality, health and welfare in organic and low input dairy systems	WP 2
Forages for productivity, quality, animal health and welfare in organic and low input dairy systems	WP 3
Environmental assessment: For improvements and communication in organic and low input dairy systems	WP 4
Competitiveness of organic and low input dairy sector: Supply chain and consumer analyses	WP 5
Socio-economic evaluation of novel strategies in organic and low-input dairy farming	WP 6
Knowledge exchange, training and dissemination	WP 7
Project coordination and overall management	WP 8







# Farms in Austria - a description

By Roswitha Weissensteiner & Werner Zollitsch,  
University of Natural Resources and Life Sciences, Vienna, Austria



Austria's farms for SOLID: "For the rapid assessment in WP1, farms were identified for the case study. They should represent traditional alpine dairy production, which can be characterised as low input, with organic dairy production playing a major role".

In Austria dairy production is one of the most important agricultural activities, as more than 50 % of the agriculturally used land is permanent grassland. This is mainly located in mountainous areas from the west to the centre of Austria, alongside the ridge of the Alps. 70 % of all Austrian dairy farms are located in these disadvantaged areas and produce about 2/3 of the milk with herds of on average between 10 and 15 cows.

The predominant alpine dairy production system can be characterised as low input, with organic dairy production playing a major role. In these production systems, feeding during summer time is based on the utilization of permanent grassland, which is cut 2 or 3 times and conserved as hay or silage. During the winter time cows are typically kept in barns for 5 to 6 months. The input of concentrates is relatively low. In general little (conventional) or no mineral N fertilizers (organic) are used, manure is the main source for fertilizing grassland.

## The organic dairy cooperative "Sennerei Hatzenstädt"

For the rapid assessment in WP1, farms were identified for the case study, which should represent traditional alpine dairy production. Therefore members of the organic dairy cooperative "Sennerei Hatzenstädt" (Table) were chosen to participate in the rapid assessment.

The cooperative is situated in Tyrol, an alpine province in the West of Austria. It has about 40 members, which

deliver their milk to the cooperative dairy plant where it is processed to hard cheese and other dairy products.

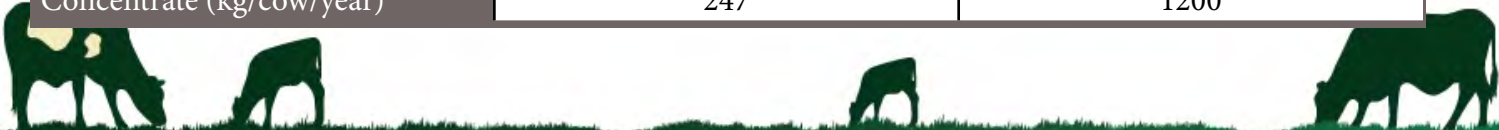
## Farmers visited and interviewed

Last winter 12 farmers and their families were visited and interviewed. The farms are relatively homogenous in their structures; they are small in size, they are managed as typical low input systems with relatively low lactation milk yield, but also with an absolutely low use of concentrates (Table). They are managed by the farmer's family, which typically consists of members of three generations; no further staff is employed. The on-site conditions are characterised by steep slopes, a relatively short growing season and an annual precipitation of 1200 to 1800 mm. Only permanent grassland, but no arable land is farmed. All farmers also own forest land, and earnings from selling timber is important for the total farm-income. All farms have several economic cornerstones: The main source of income is the dairy production, in addition to incomes from forest, direct marketing of meat, agro-tourism and other non-farm incomes.

In a workshop with farmers, the results of the rapid assessment were presented and potential issues for further research were identified and discussed. In a meeting scheduled for autumn 2012 one research topic will be finally defined which will be followed up in 2013.

Table. Members of the organic dairy cooperative "Sennerei Hatzenstädt" participating in the rapid assessment

	Sennerei Hatzenstädt	All organic dairy farms
Farm size (ha)	22.7	20.1
Herd size (no. of adult cows)	13.1	9.9
Milk yield (l/cow/year)	5100	6200
Concentrate (kg/cow/year)	247	1200





# Assessing whole farm sustainability



By Katharine Leach & Susanne Padel, Organic Research Centre, Elm Farm, UK

"Whole farm sustainability assessments have been an effective way of opening up discussions with dairy farmers on what is needed to make their farms more sustainable, and revealed some interesting differences between countries".

At the start of our participatory research, the first contacts with farmers have been made, by assessing whole farm sustainability on ten dairy farms in each country. The SME Partner organisations, which include farmer co-operatives, organic certification bodies and advisors, have helped to recruit farms illustrating the range of organic/low input systems involved with the partner, in terms of size, intensity or level of input use (within the organic or low input population), commonly used breeds, marketing channels and type of products.

## Farmer interviews

Farmer interviews provide information on aspects of farm sustainability (Figure 1). For each of these "spurs", the assessment is based on scoring key activities, using a mixture of quantitative and qualitative data, readily available in farm records. Each activity is scored between 1 (lowest mark) and 5 (high presence of activities contributing to sustainability). For example, the score for biodiversity considered participation in agri-environmental schemes, the presence of habitats, and rare species. The score for animal health and welfare was comprised of 4 activities related to health, feeding, housing and natural behaviour. Some activities were assessed using several questions

while others required only one. Farmers can see their own results on a "spider diagram" and later compare their farms with other scores (see example for Denmark in Figure 1).

## UK farms

In the UK, farms were members of OMSCO, a cooperative selling cows' milk from 300 dairy farmers. Selected farms had 167 - 422 ha and 105 - 378 cows. UK farms scored comparatively low on nutrient management, but the farmers were interested in improving their soil and some linked this with a need for better manure management. Farms from Calon Wen, a Welsh cooperative partner, will be visited during summer 2012.

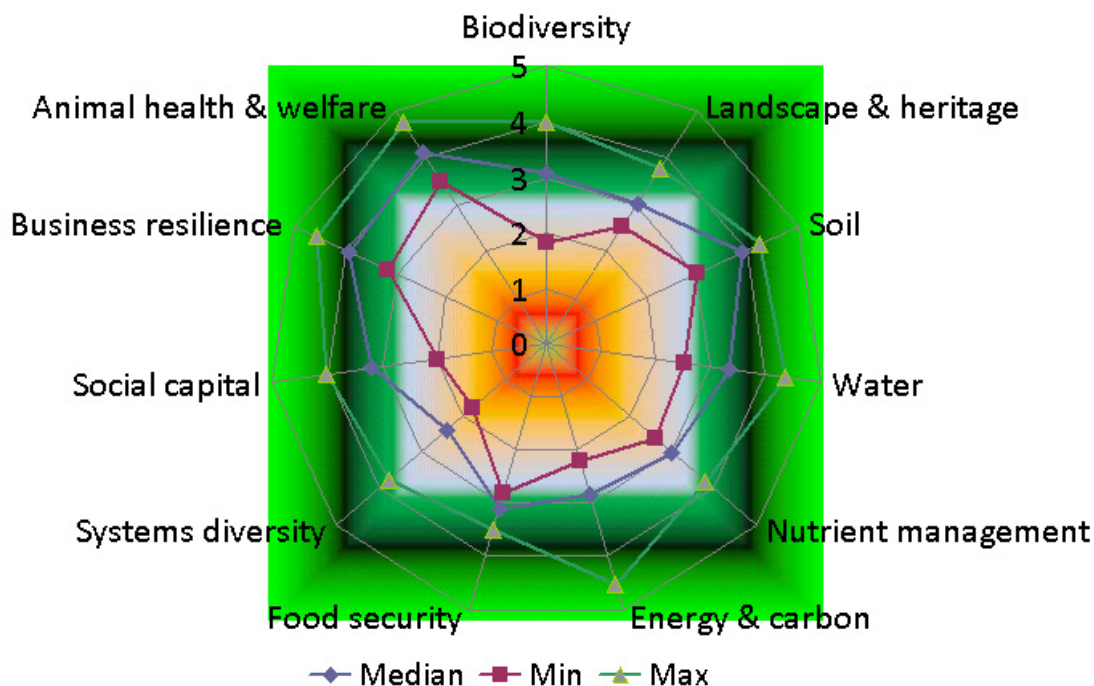
## Austrian farms

Austrian farms were members of the organic producer cooperative "Sennerei Hatzenstädt" in Tyrol, which has about 40 farmer members and mainly produces cheese. The farms are in mountainous areas, small (10 - 17 cows), and have several different enterprises, usually including forestry. Because there is no shortage of water in these areas, water management is not a priority, resulting in low scores for this spur (read more at page 3).





Figure 1. Summary of sustainability indicator scores for 10 organic dairy farms in Denmark.. A higher score indicates more activities that contribute to greater sustainability.



### Finnish farms

The Finnish farms comprised all the members of Juvan Luomu Ltd, the only totally organic dairy in Finland. Herd size was 20 - 170 cows, and average yield was 8000 kg/cow (1000 kg less than the Finnish conventional average). Four farms also produce biogas from manure and food wastes.

### In Denmark

Thise Dairy Company is one of the pioneers of organic milk supply in Denmark, with a strong focus on quality and innovation throughout the production chain. The assessment showed a strong influence of regulations, leading to comparatively high scores for soil, water and fertiliser management.

### In Belgium

This was also the case in Belgium, where the farmers were paying particular attention to soil management and animal health and welfare due to strong regulation and public demand. They were recruited with the help of Wim Govaerts and Co, an SME that is active in advisory services for dairy farms (cows, goats and sheep) also in the Netherlands and France.

### In Romania

Agro Solomonescu in Romania operates a low-input dairy unit (500 ha and 150 cows) as well as collecting milk from other dairy farms. Farms recruited covered the varied geographical regions in Romania. More than half were using no chemical fertiliser. Some farmers would be interested in becoming organically certified, but had no clear knowledge of the specific rules and implications.

### In Italy

In Italy the SME is an organic certification body, ICEA, whose head office is in the Bologna region, where Parmigiano cheese is a local speciality. Italian farms studied

included those producing milk from cows and goats; two low-input but conventional farms were included for comparison.

### In Greece, Spain and the Netherlands

Goat farms were also assessed in Greece, Spain and the Netherlands (through the Belgian partners). The Greek research partner DAPVET recruited farms more widely. Many Greek goat farms were operating with very low energy inputs, in some cases without electricity.

Cabrandalucía in Spain is a Federation of six goat breeding associations in Andalucía. The farms recruited through this SME are mainly low-input, but some are organic. They keep between 225 and 600 goats, with some producing cheese. Farmers were interested in novel forages, particularly the work on ensiling tomatoes with straw which will be further investigated in SOLID Work Package 3.

### On-farm trials

The findings of this exercise are now being reported and used to stimulate discussion on research topics at farmer meetings in each country and will lead to the development of on-farm trials in most countries in the next stage of the project.





By Werner Zollitsch,  
University of Natural Resources and  
Life Sciences, Vienna, Austria



# Cattle and goats

## - breeds adapted to organic and low input dairy production

SOLID, WP2 is studying breeds which are perceived by producers and industry partners as being specifically adapted to the conditions of organic and low input dairy production systems.

The core question of SOLID work package 2 is to study breeds which are perceived by producers and industry partners as being specifically adapted to the conditions of organic and low input dairy production systems. This issue will be studied for both dairy cows and goats in different geographical regions.

In order to contribute to the understanding of the consequences of adaptation, system-specific risks for animal health and welfare will also be analysed.

### Currently ongoing activities: screening of farms, feeding experiments, analysis of complex data bases

The concept of adaptation of breeds to a specific environment is not restricted to dairy cows. Together with producer groups and industry partners, scientists are working to identify differences in production and health traits between different breeds of dairy goats, including indigenous breeds, in Greece. This work is the first of its kind in Greek dairy goats.

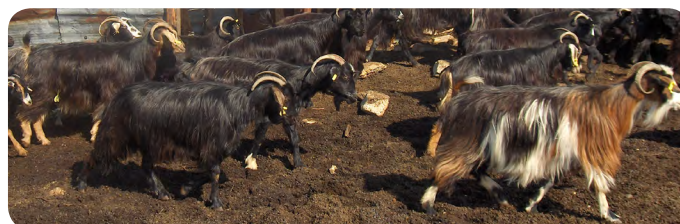
In order to find out how adapted breeds react to nutritional challenges which are typical for low input systems, they are currently compared with conventional breeds in feeding trials at two different geographical locations; the

work will be expanded to a third site in the coming winter. Differences in energy utilization are frequently discussed as a potential factor contributing to the adaptation of breeds to a specific environment. Because of its highly complex nature, only a small number of extensive data sets exist which would allow to characterise this phenomenon. The cooperation between two leading institutions makes it possible to properly address this complex issue.

### Coming up: Biomarkers, on-farm animal welfare

Conducting feeding experiments and screening herds not only yield primary production data and information on milk quality; collecting milk and blood samples for analysing biomarkers will result in a much deeper insight into the animals' physiological and health status. In close cooperation between different working groups, this task will start once the sample collection has been finished in the experiments mentioned above.

In the coming winter season the animal health and welfare status in typical organic and low input production systems will be assessed at three different geographical locations. This will contribute to a better understanding of system-specific risk factors which is essential for developing improvement strategies and for utilizing adaptation concepts in livestock breeding.





# Novel and under-utilized feed resources

## - for use in organic and low input dairy production



By Marketta Rinne, MTT Agrifood Research, Finland

In SOLID, WP3, a desk-top review was conducted: "The overview of the literature demonstrates a wide variation in the potential novel and underutilized feed resources to be used in organic and low input dairy systems, and in many cases also the lack of scientific knowledge which may prevent the efficient use of some feeds".

Innovative use of novel and underutilized feed resources has the potential to improve the efficiency of the "green economy" by finding the most relevant uses for different biomass fractions in synergy between agriculture, bio-energy production and other industries. By-products from agricultural, forestry, food processing and bioenergy sectors can be considered sustainable sources of additional feeds in forage based dairy diets, and agro-forestry systems may provide additional roughage.

Increasing demand of processed organic foods for human consumption gives rise to the availability of organically labelled by-products. This may broaden the feed supply for organic livestock and increase supply of organic milk. The possibility to use the by-products as organic feedstuffs should also increase their economic value compared to alternative uses such as consumption as conventional feedstuffs or in bioenergy production.

### There is a feed for every need

The overview of the literature demonstrates a wide variation in the potential novel and underutilized feed resources to be used in organic and low input dairy systems, and in many cases also the lack of scientific knowledge which may prevent the efficient use of some feeds.

The variation is caused by the diversity of the raw materials and variability in raw material composition, which are further diversified by the processing technologies applied. The variability in the feed materials may provide opportunities to find suitable supplements in terms of e.g. energy, protein and mineral concentrations to various situations depending on the type of animals and basal feeding.



Tomato + straw silage







collecting olive cake

Goats eating  
tomato+straw silage

collecting tomato wastes



tomato wastes

By-product feeds often have a high moisture content and transportation and/or preservation may significantly increase the cost of the feeds, emphasizing the importance of logistics. Preservation also plays an important role in ensuring safety of the whole food-production chain.

Meals from various oilseeds such as **Camelina**, **Crambe**, **Safflower** and **rapeseed** provide protein rich supplements after oil extraction. Production of them on-farm could offer a good opportunity to increase supply of oils either for human consumption or biodiesel production, to produce high quality protein supplements for animals and to improve farm economy.

**High-protein and low-fat distillers' grains** are results of sophisticated industrial processes in order to extract as much as possible from the cereals (e.g. oil) and to diversify and add value to their by-products in order to meet the farmers' requests (e.g. the case of high-protein distillers' grains).

**By-products from the pulse industry** are good sources of protein. Legumes are also able to fix nitrogen from the atmosphere giving them an essential role in the nitrogen supply to the organic farming.

**The minor species** (buckwheat, mustard and Canary seed) are scarcely characterized from a nutritional point of view although they may have significance as local feed resources.

**Olive leaves and cakes** are by-products from olive oil production, and if adequately supplemented, they may be successfully used in animal diets. Tomato wastes offer a cheap source of energy and protein with high digestibility; however, the high moisture content makes the processing and storing challenging.

**Carbohydrates from wood** are available in large quantities, but because of very low digestibility of intact wood, heavy processing is required to improve their digestibility. The unpredictability and variability of the feed supply from agro-forestry systems is a challenges to their use, but fast growing trees provide the potential for a large quantity of material. Valorisation of the silvopastoral systems requires a change in the mindset of the farmer. Harvesting, preservation and transportation questions also need to be solved for agro-forestry based systems before they can be adopted in wider use.

**Research can support the use of novel feeds**

The amount and quality of feeds offered to animals have significant effects on feed intake and milk production, which largely dictates the economics of production, but they may also influence milk quality and health of the animals. This review was unable to draw any clear-cut conclusions on the latter because of lack of information and large variability among and within feed materials reviewed.

If the feeds contain some bioactive compounds such as tannins or salicylic acid in fodder trees, or some harmful substances or residues, substantial responses can sometimes occur in animal health or product quality. The

Tomato and straw silage





Table. An overview of various novel and underutilized feedstuffs as supplements in organic and low input dairy production. A minus (-) includes negative and a plus (+) positive effects whereas a question mark (?) indicates lack of knowledge.

Feed	Qu- antit. signifi- cance	High energy value	High pro- tein value	Effect on milk quality	Effect on animal health	Lack of antinutrit. factors	Ease of pro- ces- sing	Ease of pres- ervation	Suitability for organic production	Suita- bility for low input
Camelina meal	-	+	++	+	?	+	+	+	++	+
Crambe meal	-	+	++	-	-	-	+	+	+	+
Safflower meal	-	+	+	+	?	?	+	+	++	+
Reduced fat distillers grains	++	+	+	+	?	+	--	+	?	-
High protein distillers grains	+	+	++	+	?	+	--	+	?	-
Whole rapeseeds (on-farm)	+	++	++	+	?	-	+	+	+	++
Rapeseed pxpeller (on-farm)	+	++	++	+	?	-	-	+	+	++
Lupin by-products	-	++	++	+	?	-	+	+	++	++
Pea, bean, chickpea and lentils	+	+	+	+	?	+	+	+	++	+
Buckwheat, mustard, Canary seed	-	?	?	?	?	-	?	+	?	+
Olive leaves	++	+	-	+	-	-	+	+	-	++
Olive cake	++	++	-	+	+	-	-	-	-	++
Tomato pomace	++	++	+	++	?	+	-	-	-	++
Wood by-products	--/?	-/+	--	-/+	?	+	--	--	--	-
Agro-forestry	+	-/+	-	?	?	-	+	-	++	++

key issue in controlling the potential positive or negative effects on product quality and animal health is to know the chemical composition and concentrations of bioactive compounds in the particular feed material used as well as their fate in the rumen. According to EU legislation, the producer of the feed material is responsible for the safety of the product emphasizing the need of knowledge of potential deleterious effects of feeds.

#### Strict rules on the acceptability of feeds

Legislation and public opinion set rather strict rules on the acceptability of feeds, particularly in organic but also in low input conventional dairy systems. In some cases, particularly in adopting truly novel feeding practices such as agro-forestry systems in intensive temperate production systems, or including novel industrial by-product feed ingredients, the socio-economic aspects play an important role. The role of biological research in such cases is to provide

reliable information of the feeding value and safety of the new feeding methods.

It is ultimately up to the whole supply-chain, consumers and authorities to decide which new feeding methods will be taken into use. The innovative and conservative approaches need to find a sound balance, and solutions are likely to vary in different regions. A broad-minded approach to valorise novel or under-utilized feed materials may also be valuable in cases of a crisis situation when

availability of conventional feeds would be impaired.

In the next phases of WP3 research program, a number of potential feed materials will be subjected to laboratory analyses and in vitro screening.

Finally, some feeds will be chosen for feeding trials both to goats and cows to find out their intake and production potential and effects on milk quality.

*silage bale*





# Brief News from SOLID

## SOLID meeting held in Guiglia, Bologna

A SOLID Meeting and a Governing Council Meeting have been held in Bologna, Italy on Thursday 26th and Friday 27th of April 2012.

During the two days meeting, presentations were made by the participants involved in the different workpackages and the activities and preliminary results were discussed. On Saturday a farm visit tour was arranged.



## Events

### The 63rd EAAP Annual Meeting 2012

*August 27 - 31, 2012, Bratislava, Slovakia*

The general theme of the meeting focused on "Sustainability and efficiency of the livestock sector". A SOLID Symposium was held in EAAP Bratislava: "Organic and Low Input dairy systems" chaired by Nigel Scollan.

**Conference:** How can we ensure sustainable cattle production systems for future generations?

*- September 9 - 11, 2012, Falkenberg, Sweden*

The increasing demand for meat and milk will continue to force agriculture to lower its environmental footprint. Today's farmers need to plan for the future. This conference will help provide information to enable farmers, researchers, policy makers and consumer organizations to deal with these complex issues now and in the future.

[Read more...](#)



## Related EU projects

[ANIMALCHANGE](http://www.animalchange.eu) ([www.animalchange.eu](http://www.animalchange.eu)):

will provide a vision of the future of the livestock sector under climate change.

■ ■ ■ ■

[Multisward](http://www.multisward.eu) ([www.multisward.eu](http://www.multisward.eu))

will support developments and innovations in grassland use and management in different European farming systems (including low-input and organic).

■ ■ ■ ■

[LowInputBreeds](http://www.lowinputbreeds.org) ([www.lowinputbreeds.org](http://www.lowinputbreeds.org))

will improve animal health, product quality and performance of organic and "low input" production systems.

■ ■ ■ ■

[Ruminomics](http://www.ruminomics.eu) ([www.ruminomics.eu](http://www.ruminomics.eu))

will integrate expertise and technologies to increase rumen efficiency and decrease the environmental footprint of ruminant production.

■ ■ ■ ■

[Rednex](http://www.rednex-fp7.eu) ([www.rednex-fp7.eu](http://www.rednex-fp7.eu))

will develop innovative and practical management approaches for dairy cows that reduce N excretion into the environment.

■ ■ ■ ■

[RobustMilk](http://www.robustmilk.eu) ([www.robustmilk.eu](http://www.robustmilk.eu))

will develop new practical technologies to allow breeders to re-focus their selection to include milk quality and dairy cow robustness.

## The 2nd IFOAM Animal Husbandry Conference

*September 12-14, 2012*

*Hamburg, Germany*

This conference will concentrate on health and food safety in organic livestock production systems, marketing trends, innovation in organic livestock production systems and livestock breeding strategies.

Results from SOLID WP1 and WP2 will be presented at the conference.

[Read more...](#)

