SOLID is a European 7th Framework Programme project

# SOLID News

Newsletter of the SOLID project • 2013 • 3rd issue

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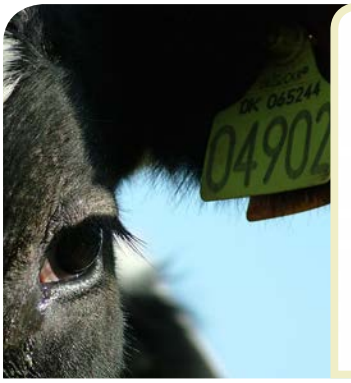


## About the SOLID project

SOLID is a European project on Sustainable Organic and Low Input Dairying financed by the European Union. The project runs from 2011-2016.
25 partners from 10 European countries participate in the project.

# Welcome by the co-ordinator

Welcome to the third Newsletter from SOLID. With two years completed of this five year project many interesting results are being generated on key issues in organic and low input dairy systems.
This newsletter highlights two main areas of activity (1) environmental and (2) socio-economic aspects of dairy systems. It is noted that preserving biodiversity is very important but it is less clear what effect food production has on biodiversity. Studies in workpackage 4, based on data from three European countries, have developed an approach to calculate the overall biodiversity loss of a dairy system and are investigating how biodiversity may be factored into life cycle assessment. Research in workpackage 6 examined innovations in organic and low input dairy chains, which were considered to be appropriate and useful by stakeholders across supply chains from consumers, producers, processors and retailers. The research conducted across four EU countries, Belgium, Finland, Italy and UK, seeked input on the acceptability of a range of innovations such as feeding strategies, breeds, supply chain management. Such research is vital to help us understand the potential application of new innovations across stakeholders in dairy supply chains and also helps to identify other areas which may be of assistance in improving dairy production chains.
SOLID takes a very strong participatory approach and involves a number of SME partners. This newsletter features two of our SME partners, Juvan Luomu Ltd, an organic milk producer in Finland and the Institute of Organic Advice and Training in the UK. It is great to see our SMEs play a very active role in the project.

# 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 diary 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 |

# Biodiversity
## - how can we include it in environmental life cycle assessments of products?

By Marie Trydeman Knudsen, John E. Hermansen, Aarhus University, Peter Dennis, Aberystwyth University & Matteo Guerci, University of Milan

SOLID, WP4 is working on improving the environmental life cycle assessment (LCA) of dairy production – e.g. including the effect of soil carbon changes and on biodiversity. Using a new approach to include biodiversity in LCA of dairy systems in three European countries indicated that a high share of grassland in the dairy systems reduced biodiversity losses accumulated over the entire chain.

European dairy production affects the environment in various ways such as climate change, nutrient leaching etc. Life cycle assessment is a method used to assess the environmental impact of e.g. a litre of milk or a kg of cheese. Life cycle assessments are for example used to calculate the carbon footprint that can be found as a carbon label on some products in Europe. However, the carbon footprint only documents the effect on climate change. But other environmental impact categories are also important, such as eutrophication and biodiversity. In order not to underestimate impacts when evaluating different systems, various environmental impact categories needs to be included. However, the problem with biodiversity is that it is very hard to estimate – especially in a life cycle assessment when the aim is to accumulate the effect over the entire chain and document it e.g. per litre of milk. The 'European Food Sustainable Consumption and Production Round Table' (Food SCP) acknowledges the importance of biodiversity on the political agenda and in the environmental impact assessment of food and drinks products, but it considers that more scientific research is needed to be able to quantify properly the impact of food and drink products on biodiversity.

### A new approach for biodiversity was applied, studying dairy production systems in three European countries

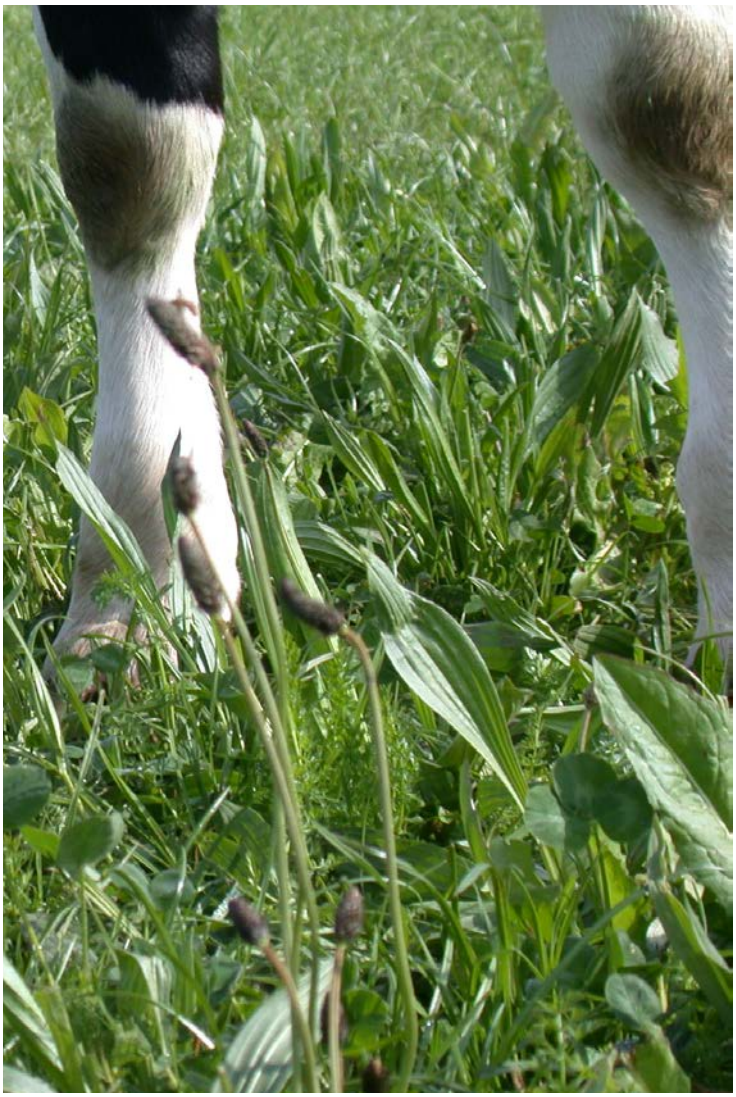
An approach to estimate the effect on biodiversity in different agricultural systems was suggested in a recent paper from the UK. The basic idea is to compare the biodiversity loss (potentially disappeared fraction of plant species) of the actual land cover (e.g. arable land, grasslands etc.) to a baseline of semi-natural forest. It is assumed that losses in plant diversity reflect losses in biodiversity in general. Based on the different types of land covers in dairy systems, an overall biodiversity loss can be calculated. The biodiversity loss of organic arable land is e.g. 0.36 – meaning that 36% of the plant species richness in the baseline is potentially lost, when we cultivate the land with organic arable crops. Whereas the biodiversity loss in organic grassland compared to the baseline is 0 – meaning the nothing is lost and the species richness is the same. An overall biodiversity loss of a dairy system can be calculated by combining the biodiversity loss for the different types of land covers in the dairy systems.

We tested this approach when making life cycle assessments of dairy systems in three European countries. The biodiversity loss of the dairy systems were divided by the amount of milk produced in the system – as we normally do in life cycle assessment – to get an estimate of biodiversity loss per kg of energy corrected milk (ECM). The preliminary results indicated that a high share of grassland in the dairy systems seems to reduce both the carbon footprint of milk and the biodiversity loss (Figure 1).

The biodiversity loss was lower with a high share of grasslands because the plant species richness is higher in grasslands than arable land. The lower carbon footprint of milk in systems with a high share of grasslands was due to a greater carbon sequestration in grasslands compared to arable land and less energy requirements for tillage and sowing.

### Validating the approach with BioBio data from other European countries

The basic data for biodiversity loss in different types of land covers was based on data from the UK. However, it is important to test whether this relationship is consistent with data from the rest of Europe. Therefore, data on plant species richness of different types of land covers in different European countries from the BioBio project will be used to validate the approach and estimate biodiversity losses from the different types of land covers in Europe. Furthermore, the approach might need to be refined to include more agricultural land covers in Europe. Finally, the assumption, that losses in plant diversity reflect losses in biodiversity in general, will be tested by assessing if the relationship revealed for plant species is consistent with that experienced by other organisms, such as invertebrates.



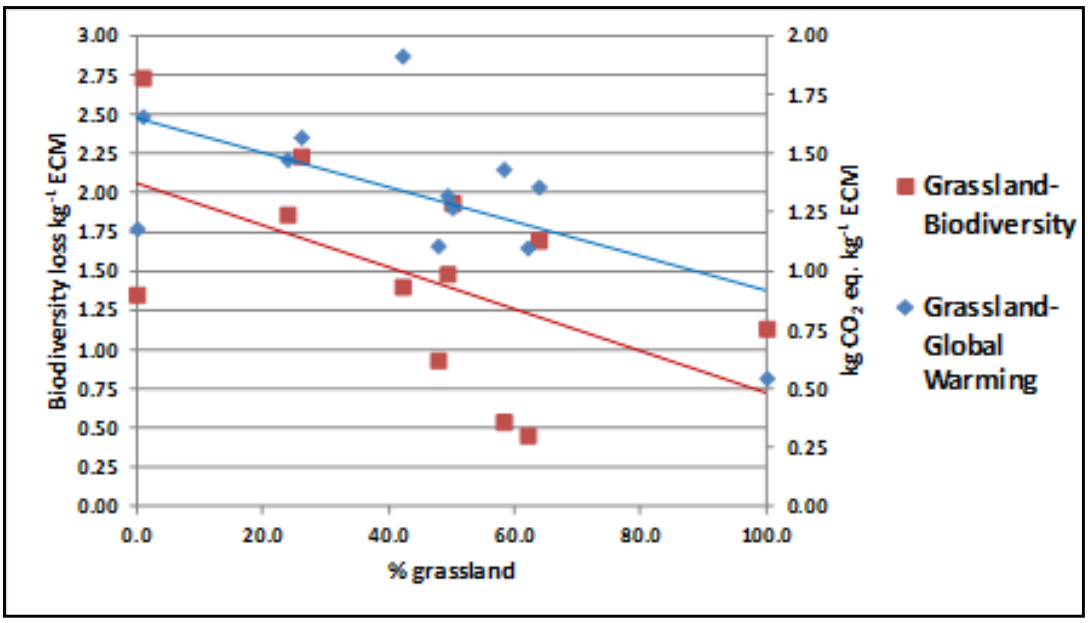



*Figure 1. Biodiversity loss kg-1 ECM (energy corrected milk) and carbon footprint (kg CO2 eq. kg-1 ECM) as affected by the share of grassland in different dairy systems in three countries in Europe. The twelve different dairy systems are each represented by a dot in the graph.*

# Which kind of innovation do the dairy supply chain members want?


Photo: Colourbox

By Raffaele Zanoli , Serena Mandolesi , Simona Naspetti , Pip Nicholas*
Università Politecnica delle Marche *Aberystwyth University

An innovative transnational study was developed in organic and low input dairy supply chain, involving 99 participants from 4 European countries (Belgium, Finland Italy and UK).

The intent of our research was to identify which kind of innovation supply chain members would like to see in organic and low-input dairy farming. The survey took place in the four EU countries between March and July 2012. A total amount of 99 supply chain members participated in the survey. Focus groups or personal interviews were organised to collect the data. The Q methodology (Stephenson, 1935) applied in this survey allows for a small amount of people to be interviewed and is particularly useful in investigating the perspectives and attitudes of participants towards innovations. Respondents were asked to rank a set of items or statements about innovations in the dairy system according to a specific condition of instruction. By cross comparing and placing the statements in a grid, they revealed their own patterns of subjectivity. Innovations included in the survey belong to distinctive categories: breeds, feeds, management and practice on farm and in the supply chain. Some interviews were used to gather more information on the reasoning behind the Q sorts made.

## Great degree of consensus

The results shows that there was consensus across all participants within the supply chain to which innovations were deemed to be unacceptable in the organic (from an ethical and/or regulatory perspective) and low-input dairy systems such as transgenic animals, speed-up calve development or in vitro recombination.
Supply chain members, being primarily individuals and dairy consumers, strongly reject innovations related to the application of biotechnology or innovation perceived as conflicting with the naturalness of the production. Innovations that individuals perceive as presently unfamiliar or containing uncertainty or unknown risks are refused (Grunert et al., 2011).
But there are many differences between supply chain members regarding which innovations they favour. Both farmers, retailers & processors appreciate the role of soil biodiversity in relation to sustainability. Farming and breeding practices maintaining the biodiversity are of utmost importance for food production, health and the maintenance of ecosystems (Thrupp, 2000). On the other side, consumers and retailers & processors assign great importance to innovations related to the feeding quality. The type of feeding – animal-feed composition – and the presence of genetically modified ingredients significantly affect their perceived quality of the product (Naspetti et al., 2012).

## Increased concern

Consumers tend to accept innovations aiming to improve animal welfare (e.g.: maternal feeding, inside housing, and herbs in pastures) and innovations with low levels of interference with any natural processes (genetic manipulation, speeding up animal maturity, etc.). Consumer concern regarding food processing has increased during the last years in most European countries due to food scares. But conveying innovations improving animal welfare can be difficult and could increase on-farm production costs. Producers, retailers and processors prefer those innovations related to feed quality, efficiency and soil management. To them the feeding quality and the efficiency of resources used are important; they particularly value innovations minimizing the use of purchase feeds through a better use of home-grown feeds and new forage varieties and continously improvement of the input quality.Consu-

mers, retailers and processors like innovations aimed at improving efficiency in the short supply chain. Milk from small local producers is considered to be cheaper but also of higher quality to reduce distances between point of sales and consumers (Grunert and Trail, 1997). Innovations in the dairy system should include solutions that can improve animal welfare, value of feeding, relationships with consumers – by better products and efficient, short supply chain – biodiversity and management of soil; and reducing the use of GMO solutions are also considered important aspects.
These findings will form the basis for further research aimed at providing pathways of changes and valuable opportunity for innovations to be introduced in the dairy system. The results of the present study will be used to focus on the next steps of the SOLID project, where we are going to assess the acceptability of novel production strategies by consumers and supply chain members.

Photo: Colourbox

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By Heli Ahonen and Arja Nykänen

*Juvan Luomu farmers participating in a SOLID workshop in May 2012. Arja Nykänen (sitting behind) and Terhi Latvala (standing) from SOLID researcher group are moderating the workshop. Photo: Marketta Rinne.*

# Juvan Luomu -a pioneering organic dairy in Finland

Juvan Luomu Ltd. started organic milk production and processing in 1993. There are 8 dairy farms situated in South Savo, which produce the milk for the dairy. The partner farms of Juvan Luomu have been organic for 10 – 22 years (mean 17 years). The farm characteristics are very close to the national organic average although the farm size is considerably larger (140 hectares) than the average (70 hectares).
Stocking rate of the farms is 0.51 animal units per hectare and annual milk yield is 7 800 kg. Juvan Luomu farmers form a tight group, which shares information and ideas together, and has operational cooperation such as purchasing of organic protein supplements. They have also actively participated in several R&D projects.

Juvan Luomu is the only dairy in Finland, which concentrates solely on organic products. The annual milk production is 2.5 million litres. The products include natural and flavored organic yoghurts, which are marketed under private labels for the main super market chains in Finland. Juvan Luomu also makes close cooperation with another dairy, Juustoportti Ltd., which produces fresh milk products and cheeses, and takes care of their marketing.

The role of Juvan Luomu in the project is to contribute to sustainability assessment of the farms, on-farm research and knowledge transfer from the project to farmers and advisors in Finland. In the sustainability assessment, the highest mean scores for Juvan Luomu farms were achieved in Farm Business Resilience, Animal Health and Welfare and Nutrient and Soil Management. Farmers considered their farm profitability to be quite good and expected it to be the same or better in the future.

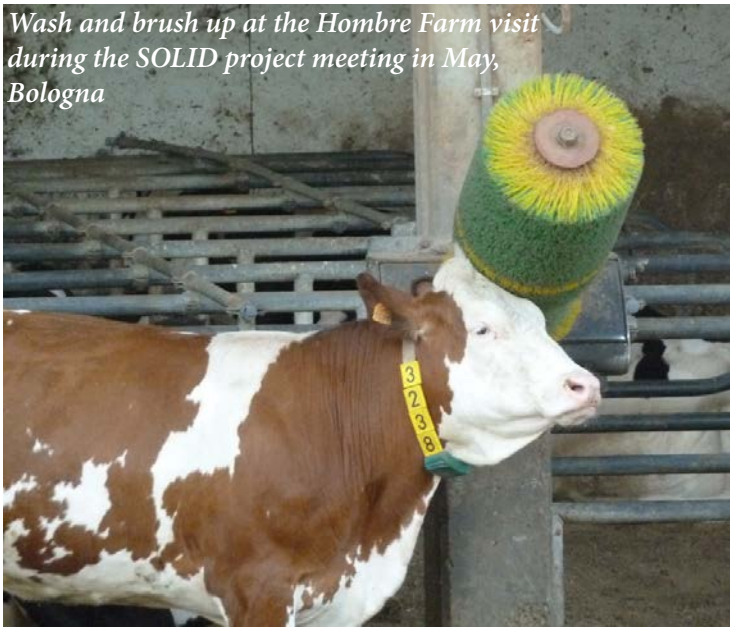
In Finland, farmers actively utilize the information from advisors, farmer magazines, seminars, the Internet and even from abroad. They make economic and other plans for their farms and have good forward vision. All the Juvan Luomu farms had health care plans which were formulated together with a veterinarian and updated it regularly. It is also notable that soils and manures are analysed on all farms and computer based programmes are widely used for nutrient management planning and are completed with the help of an advisor.

As part of SOLID project, on-farm research will be conducted at Juvan Luomu partner farms. The topics elaborated in workshops will focus on on-farm produced protein feeds and protein self-sufficiency. Higher clover proportion in leys, including lucerne in leys (not commonly used currently), faba bean in mixtures with whole crop cereal silage as well as blue lupin for feed are the topics to study. Studies are conducted together with the research partner MTT Agrifood Research Finland.

*Heli Ahonen represents Juvan Luomu in the SOLID project and is a member of the Stakeholder Panel. She is also a dairy farmer and greets here the heifers, which are both Holstein (black and white) and Finnish Ayrshire (red and white). Photo: Marketta Rinne.*

## Institute of Organic Training and Advice

# Challenges and innovation in dairy farming




*Wash and brush up at the Hombre Farm visit during the SOLID project meeting in May, Bologna*

By Mark Measures, Director IOTA

IOTA is bringing to the SOLID project input from practical dairy advisers and the experience of past dairy research and development. SOLID provides an important opportunity for organic advisers to contribute to the development of dairy farming through research.
As a partner the Institute of Organic Training and Advice (IOTA)(part of Organic Research Centre), is bringing to the project a group of experienced organic advisers, together with information collated from the review and analysis of organic research that we have been doing over the last 10 years.
Building on this experience we look forward to making some significant steps forward in feeding, management and health of cows and being able to play a valuable role in disseminating the results from the project.

Initially IOTA contributed to SOLID Work Package 1, Innovation through stakeholder engagement and participatory research, providing input to identifying research priorities, supporting the development of research projects and being involved in sustainability assessment. IOTA has previously helped developed a farm sustainability assessment tool (ORC Public Good Tool) which is used by advisers to help farmers identify opportunities for farm development. IOTA advisers have been using the tool in the SOLID project to identify sustainability parameters, assess current farming practices and systems and to inform future research priorities.

Active participation from farmers through a series of farm meetings and a workshop at the ORC Producer Conference has identified the principle areas of interest, namely forage production, cow feeding and health. This builds on the research review work done by IOTA in the past, including the reviews on forage production (Grass Clover Leys, Herbal Pastures and Whole-crop) and Dairy Cow Feeding and Mineral Supply. All five reviews are available on http://www.organicadvice.org.uk/reviews.htm Related issues such as soil fertility, milk from forage, alternatives to antibiotics and protein requirements and supply are all highlighted by farmers, as well as questions around breeding (also reviewed by IOTA) and suckled calf rearing. While it is not possible to pursue all these topics in SOLID several are now well underway.

IOTA has contributed to useful discussions at the SOLID management meetings and were involved in the dairy nutrition work package with a meeting in Rome in March. This will include the development of a farm decision making tool which will optimize the forage types and management in the light of new information on the effects of high forage diets on dairy cow energy requirements.

A key role, which IOTA will play, is the dissemination of the outcomes and recommendations of the project. While that work has not yet started it is clear that the project has already succeeded in getting the engagement of both farmers and advisers in addressing ongoing problems with organic dairy farming and in addition becoming more aware of and exploring the results of previous research work. For example interest in diverse sward mixtures and alternative soil analysis have both been stimulated by the project.

# Brief News from SOLID

## Next SOLID meeting in Greece, May 2013

The next SOLID Project Meeting will be held in Thessaloniki in Greece on the 9th to the 11th of May 2013. The hosts are Georgios Arsenos and colleagues from DAPVET. See preliminary program at www.solidairy.eu.

# Events

**NJF seminar 461**
**Organic farming systems as a driver for change**
**21-23 August 2013 Denmark**

The objective of the seminar is to encourage the seminar participants to discuss relevant main challenges and how research and developmental work can be more efficiently directed to solve problems in organic farming systems, based on the overview of work presented during the seminar.
Topics
The seminar will be arranged around the following four tracks:
1. Societal and economic viability
2. Transition to renewable resources
3. Nutrient sufficiency and management in farming systems
4. Productivity and sustainable production levels in animal and crop production. Read more....

## EU projects related to SOLID:

ANIMALCHANGE (www.animalchange.eu):
will provide a vision of the future of the livestock sector under climate change.

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

LowInputBreeds (www.lowinputbreeds.org)
will improve animal health, product quality and performance of organic and "low input" production systems.

Ruminomics (www.ruminomics.eu)
will integrate expertise and technologies to increase rumen efficiency and decrease the environmental footprint of ruminant production.

Rednex (www.rednex-fp7.eu)
will develop innovative and practical management approaches for dairy cows that reduce N excretion into the environment.

RobustMilk (www.robustmilk.eu)
will develop new practical technologies to allow breeders to re-focus their selection to include milk quality and dairy cow robustness.

**FQH-conference: 5-7 June, 2013, Warsaw, Poland.**

The Conference will focus on the sustainable systems of agriculture and their impact on food quality and human health , in the following areas:
The future of sustainable agriculture
Quality of food from organic and related systems
New methods for food quality determination
Systemic view on food and health. Read more....