SOLID is a European 7th Framework Programme project

SOLID News

Newsletter of the SOLID project • 2014 • 5th issue

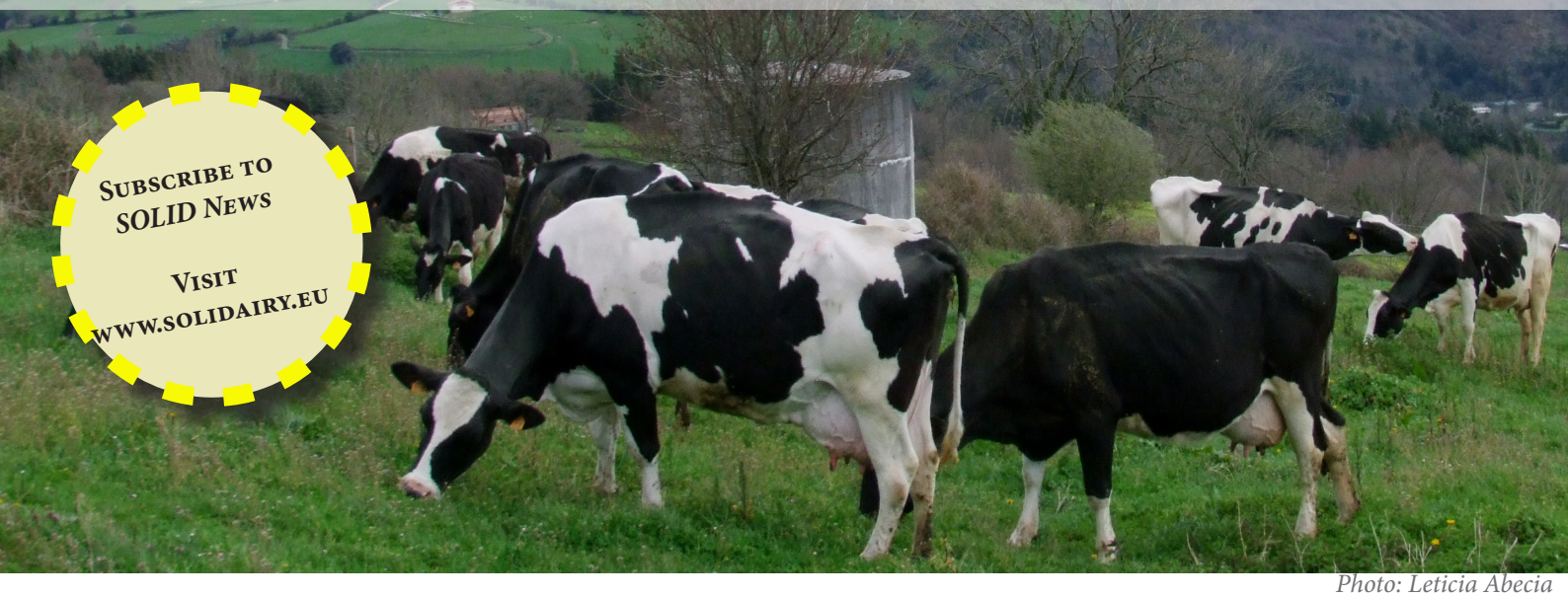

Photo: Leticia Abecia

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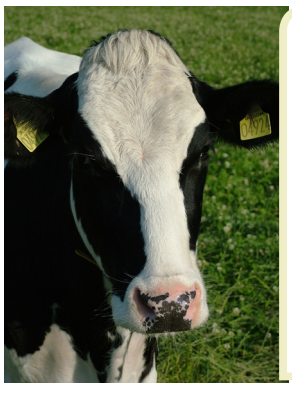
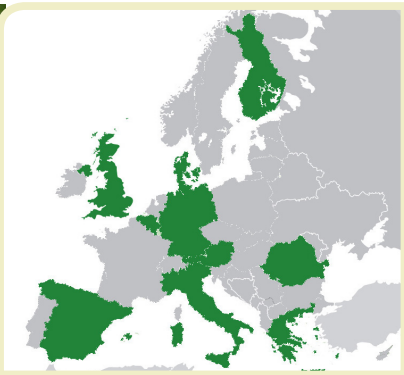




About the SOLID project

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

Welcome by the coordinator

Welcome to the fifth Newsletter from SOLID.

The project has now been running for 3 years and lots of exciting work is taking place on key issues in organic and low input dairy systems. We have continued to build on a suite of excellent participatory research in SOLID working closely with producers and companies across supply chains. This newsletter highlights two main areas of activity (1) welfare assessment in organic and low input dairy cow systems and (2) agroforestry systems. The welfare studies, within Workpackage 3, have been evaluating the welfare state of dairy cows in organic and low dairy systems in three European countries (Northern Ireland, Spain and Romania) to identify associations with system-specific factors and develop risk-based improvement strategies.

Interest in the multi-functional benefits of Agroforestry is increasing both in terms of underpinning research and in farm practice. Studies, within Workpackage 3, are examining the economic and environmental impact of agroforestry on organic and low-input dairy systems in the UK.

In SOLID, research partners work closely with industry in many countries. One such example is highlighted in this newsletter, the Andalusian Federation of Goats Purebred "CABRANDALUCIA". The Federation was launched in 2005, to assist in bringing together and coordinating the activities and projects undertaken by goat breeders in Andalucia.

SOLID continues to build linkages with other EU and national projects. One such project, MACSUR, was launched in October 2012. MACSUR is a knowledge hub within the FACCE-JPI (Joint Programming Initiative for Agriculture, Climate Change and Food Security) seeking to conduct risk assessments of the impacts of climate change on European agriculture with emphasis on crops, livestock and trade - see www.macsur.eu for further information. The Livestock Modelling (LiveM) component in MACSUR brings together 30 institutes from 14 European countries with expertise in a diverse range of disciplines, from grassland and farm-scale modelling through to livestock disease and health research. LiveM will be holding a Livestock Modelling and Research Colloquium in Bilbao, 15-16th October 2014. Please see the MACSUR website for further details.

Nigel Scollan, Project Coordinator

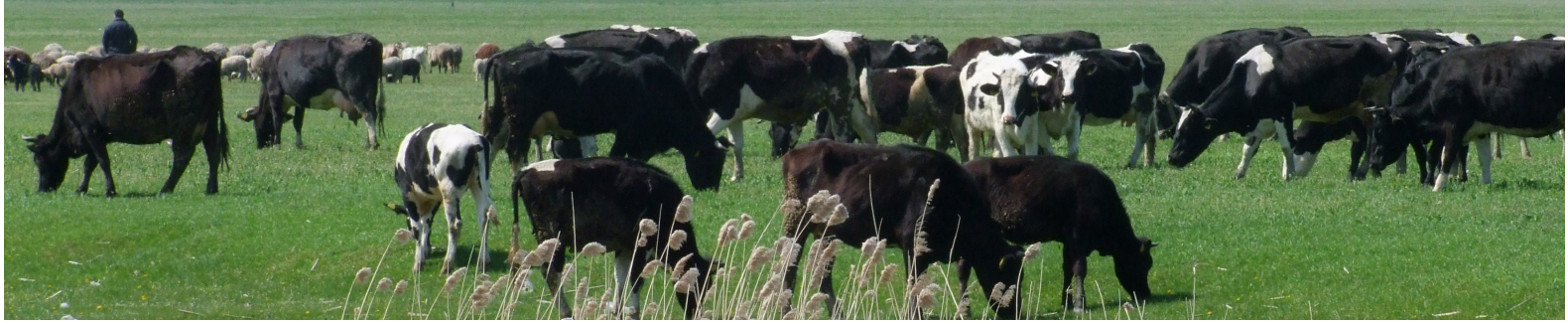
About SOLID

The objective of SOLID is to support development and innovation 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

Welfare assessment in organic and low input dairy cow systems



By Marlene K. Kirchner & Christoph Winckler, University of Natural Resources and Life Sciences (BOKU), Vienna

Figure 1 Cows on pasture in Ialomița, Romania, Photo: Marlene Kirchner

Animal welfare state on the farms studied in three different countries was mostly found to have an acceptable to enhanced level according to Welfare Quality®. Between-farm variation showed that welfare improvement may be necessary in organic and low-input dairy systems but that good to even excellent results may equally be achieved.

The management of low-input and organic dairy systems differs from that of intensive conventional production units. Especially the fact that pasturing is frequently used in these systems is perceived as more animal friendly (Reijs et al., 2013), but only limited information is available on the actual welfare state of dairy cows in low-input systems. Therefore the aim of this task was to evaluate the welfare state of dairy cows in organic/low-input dairy systems in three European countries and to identify associations with system-specific factors and to develop risk-based improvement strategies.

Ten farms in each of the following regions: Ulster (Northern Ireland, UK), Asturias, Cantabria & Basque county (Spain) and Walachia and Transylvania (Romania) were identified and visited during winter and spring 2013. The method used to evaluate the farms was the Welfare Quality® (WQ) protocol, which follows a multi-dimensional approach thus covering different dimensions of animal welfare (Welfare Quality® 2009). It has a strong focus on animal-based parameters that are complemented by a few resource- and management-based measures. In the aggregation and evaluation procedure, data from a total of 28 measures are aggregated to 12 criteria and four principle scores, which may range from 0 to 100 with a score of 50 representing a neutral state of animal welfare. In addition to the WQ scores, basic data describing the farming system were collected (table 1).

Parameter	Category/unit	mean±sd/ratio %
dairy cows	n	67±66
farm type	conventional/organic	63:37
breed	milktype, high yield (HF,RH,BS) local breeds, dual purpose, mix	67 33
milk yield	liter/cow/year	6,072±1,492
concentrate use	kg/cow/year	1,573±723
housing	tie stall/ loose house	37:63
type of lying area	concrete/rubberized cubicles deep bedded cubicles tied -long stand tied -short stand	47 23 13 17
natural mating	N/Y	60:40
access to pasture	h/a	3,521±1,856
access to outdoor loafing area & pasture	h/a	4,219±1,890
employees	N/Y	47:53
workload	cows/stockperson	30±25

Table 1 Selected farm characteristics across all three countries (mean±standard deviation or percentage for categories at farm level).

Cows in a barn in Ialomița, Romania. Photo: Marlene K. Kirchner

The farms

One third of the farms were organic and two thirds of the farms were conventional low-input farms. The proportion of organic farms varied between countries but was chosen according to the relative presence in the specific region. The average herd size was 67 lactating cows (range 15-320). Cows were mainly of dairy breeds such as Holstein, Red & British Friesian, Brown Swiss or crosses. Some farms kept dual-purpose breeds such as Simmental (Fleckvieh) or local breeds or crosses such as Asturiana, Tudanca or Pinzgauer. Cows were mainly housed in free stalls with concrete or rubberized cubicles. Three farms used an automated milking system and 12 farms kept a breeding bull. Half of the farms employed 1.3 stockpersons on average. The average workload was 30 cows per stockperson (range 7-100).

Major areas of concern and success in terms of animal welfare

At principle level, the lowest average scores were achieved for 'Good Health' (Table 2). This was mainly due to large percentages of cows having lesions and/or swellings ('Absence of injuries') and the lack of anaesthesia and post-surgical analgesia during dehorning/disbudding procedures ('Absence of pain induced by management procedures'). Further problem areas at criterion level were 'comfort around resting' (mainly due to soiling of the animals) and 'good human-animal relationship' (increased avoidance distances towards human). The strengths of the systems were found in the criteria 'Ease of movement', 'Absence of disease', 'Expression of social and other behaviours' and 'Positive emotional state'. The overall classification of the farms was 'acceptable' in 50% and 'enhanced' in 43% of the cases. One farm was rated 'excellent' and one farm was 'not classified' due to the poor welfare state. The high between-farm variation in almost all measures shows that welfare improvement may be necessary in organic and low-input dairy systems but that good to even excellent results may equally be achieved.

WQ Principle	WQ Criterion	mean±sd
Good feeding		*49 ± 27*
	1. Absence of prolonged hunger	60 ± 30
	2. Absence of prolonged thirst	69 ± 42
Good housing		*55 ± 16*
	3. Comfort around resting	37 ± 25
	4. Thermal comfort	89 ± 18
	5. Ease of movement	88 ± 19
Good Health		*39 ± 13*
	6. Absence of injuries	34 ± 14
	7. Absence of disease	67 ± 21
	8. Absence of pain induced by management procedures	46 ± 33
Appropriate Behaviour		*48 ± 18*
	9. Expression of social behaviours	69 ± 26
	10. Expression of other behaviours	76 ± 23
	11. Good human-animal relationship	48 ± 21
	12. Positive emotional state	54 ± 28

Table 2: Welfare Quality criteria and principles (in italics) scores across the three countries (mean±standard deviation; a score of 50 refers to a neutral state).

Outlook

Using statistical models, the relationship between indicators of welfare and factors related to management and housing will be investigated. Based on the associations identified, possible improvement strategies will be developed that may assist farmers and advisors in setting up herd health plans.

Many thanks to all partners providing excellent support in the three countries.

Literature

Welfare Quality® 2009. Welfare Quality® assessment protocol for cattle. Welfare Quality Consortium, Lelystad, Netherlands.

Cows in the barn in Northern Ireland, UK, Photo: Marlene Kirchner

Cows on pasture in the Basque country, Spain, photo: Leticia Abecia

Agroforestry: integrating livestock and trees

By Jo Smith, Organic Research Centre, UK

Productive land is subject to many competing demands – the demand for increased food production to meet the needs of a growing world population (the FAO estimates a 70% increase is needed by 2050); the demand for bioenergy production from biomass crops such as short rotation coppice to meet the EU Renewable Energy Directive target of 20% of Europe's energy from renewable sources by 2020; and the demand for agricultural land to support and deliver wider ecosystem services such as safeguarding soil, water and air quality, mitigating climate change, and supporting biodiversity.

Agroforestry (combining trees and agriculture) has the potential to help to meet these conflicting demands by integrating energy production from short rotation coppice, and livestock production, without compromising the delivery of ecosystem services. Although the potential of agroforestry-based agricultural systems has been demonstrated in principle, evidence on the performance of such systems in the context of European low-input production systems is lacking. This task in the SOLID project therefore aims to evaluate the economic and environmental impact of agroforestry on low-input and organic dairy systems in the UK.

The agroforestry system at Wakelyns Agroforestry (eastern England 52.4ºN, 1.4ºE) consists of twin rows of willow (Salix viminalis) with 10-12m wide crop alleys between (Fig. 1). An organic arable rotation in the alleys includes cereals, potatoes and a fertility-building ley. Coppicing for bioenergy takes place in December or January on a two year rotation. Within the crop alleys, a fertility-building ley was sown in late May 2011 as a mixture of white clovers, red clovers, lucerne, yellow trefoil and chicory. While this system does not contain livestock, the mature SRC agroforestry system provides an opportunity to address questions regarding productivity and environmental impacts. As a comparison, a neighbouring field with the same ley mix sown at the same time, has been used as a control. Managed as part of the organic arable rotation, this area has no trees within the field.

Figure 1. Organic short rotation coppiced willow agroforestry system, Wakelyns Agroforestry, Suffolk, UK. The willow on the left hand side is in its second year of re-growth, while the row in the centre has been recently harvested.

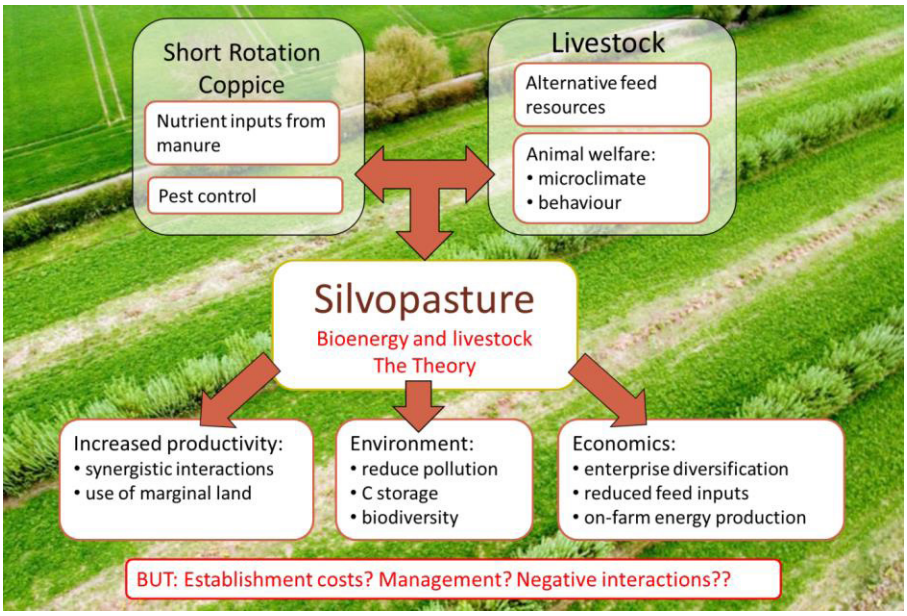


Figure 2. Interactions between silvopastoral components

Silvopastoral systems that combine livestock and trees offer two main advantages for the animals, which may have positive impacts on productivity. First, trees modify microclimatic conditions including temperature, water vapour content or partial pressure, and wind speed, which can have beneficial effects on pasture growth and animal welfare. The research at Wakelyns showed that wind speeds were lower in the agroforestry alleys in comparison with the no-tree control. Measured monthly, wind speeds were on average 2.7mph and up to 6.5mph stronger in the control than in the agroforestry. Combined with point measurements of air temperature at 1.5m, the resulting wind chill was significantly colder in the control plots during the winter months with a noticeable difference of 1 to 4°C during the cooler months.

Second, trees also provide alternative feed resources during periods of low forage availability, particularly in climates with seasonal droughts such as the Mediterranean. With SOLID partners MTT and CSIC, the feed value of the willow was assessed in 2011. Crude protein concentrations ranged from 99 to 167 g/kg DM and organic matter digestibility varied between 0.38 and 0.41 depending on the age of the willow and the season of harvest. While it is apparent that the willow is limited as a feed resource for dairy cows in terms of feed values and actual amounts, the greatest potential is as a source of roughage for dry cows or heifers, or for other ruminant species such as goats which are better able to digest the woody material.

In addition to the agricultural production, the output from the tree component, in this case as woodchip for bioenergy, can increase overall productivity from the system. Assessments of the productivity in the ley and from the willow harvested for biomass in 2012 and 2013 recorded higher biomass production in the agroforestry (Fig. 3). Woodchip from the willow SRC at Wakelyns feeds into the biomass boiler that heats the farmhouse – this saves an estimated £1200/yr on heating oil.

The research in this task suggests that agroforestry can provide a sustainable approach to ruminant production by increasing overall productivity, and modifying the microclimate to improve animal welfare. A second part of this deliverable, due in 2015, will report on the establishment and management of an SRC willow/alder silvopastoral system at Elm Farm, Berkshire, where animals from a dairy unit will be integrated into the system.

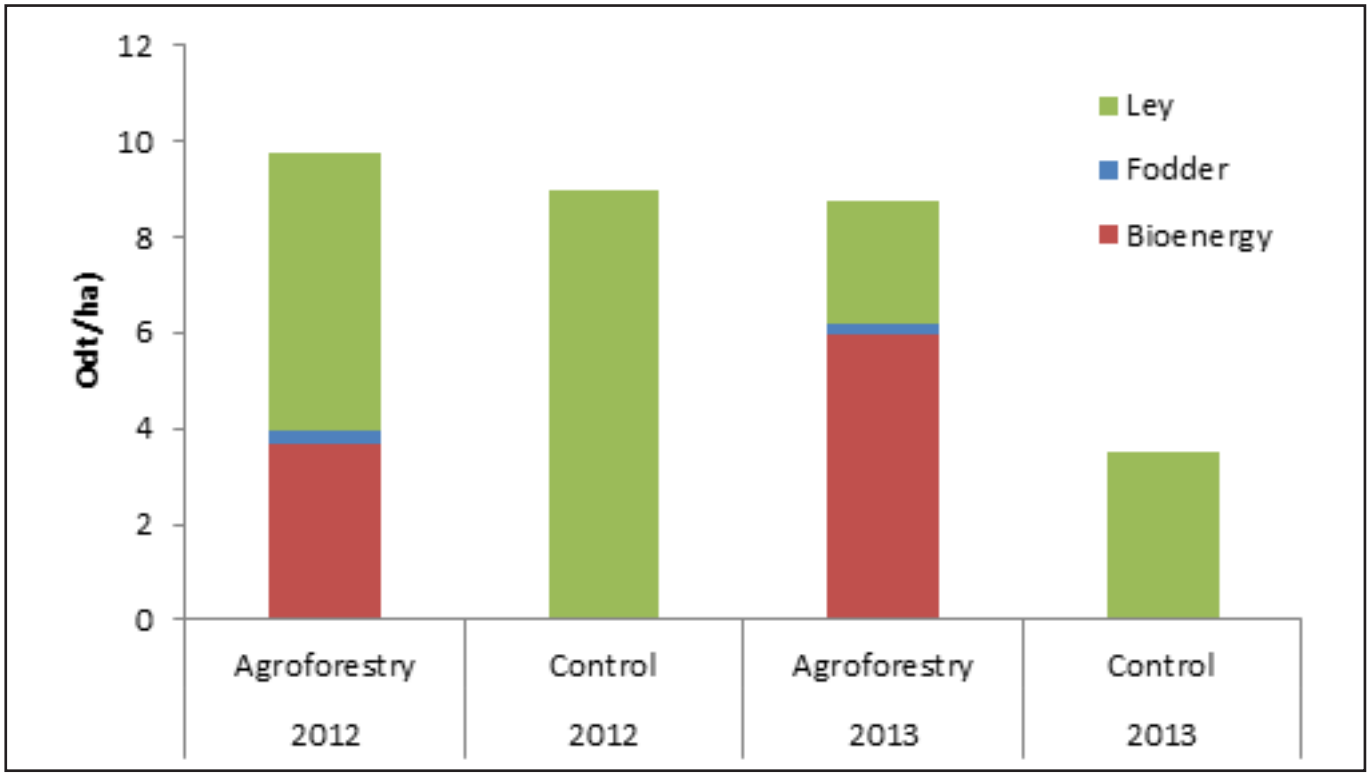


Fig. 3. Overall productivity of the agroforestry system and no-tree control in 2012 and 2013 (oven dry tonnes/ha)

New SOLID colleague

Konstantinos Zaralis has joined the Organic Research Center, UK's research team as a Senior Livestock Researcher and he is responsible for ORC's involvement in the SOLID project.

Kostas' research interests focus on interactions between genotype and nutrition on animal productivity and health, on mechanisms that underlie the regulation of metabolism, nutrient partitioning and food intake in farm animals, as well as nutritional and environmental factors that affect the ability of animals to cope with disease. He has a Ph.D. in animal health by nutrition interactions from the School of Biological Sciences, University of Edinburgh and an MSc. in Animal Production and Nutrition from the University of Aberdeen. He undertook postdoctoral research at the Scottish Agricultural College on modelling breed/genotypic differences of farm animals in production efficiency. Over the last four years he has carried out research at the Swedish University of Agricultural Sciences on the effects of maturity stage at harvest and dietary inclusion rate of whole-crop maize silage on feed intake, eating behaviour and performance of finishing dairy bulls and ram lambs. Kostas is involved in the OptGraze (Optimal Grazing Strategy for Dairy Cows) project in collaboration with Bioforsk in Norway, as well as in the Core Organic funded project on The Improved Contribution of local feed to support 100% Organic feed supply to Pigs and Poultry (ICOPP). He is member of the Nutrition Society (NS), the British Society of Animal Science (BSAS), the Nordic Association of Agricultural Scientists (NJF) and the Hellenic Society of Animal Production (HSAP).

CABRANDALUCIA: Joining efforts within the dairy goat sector in South Spain

By David R. Yáñez-Ruiz, CSIC

The Andalusian Federation of Goats Purebred "CABRANDALUCÍA" was established on 24th February, 2005 as an initiative of bringing together and coordinating all activities and projects undertaken by the goat breeders association in Andalucía.

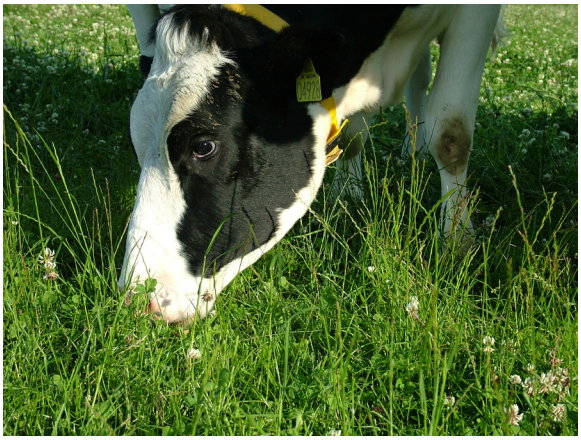
It is currently composed of six associations: Murciano-Granadina, Malagueña, Florida, Payoya, Blanca Andaluza and Negra Serrana. They include about 300 farms with goats and a census of more than 101,000 dairy goats. Such holdings are spread throughout the Andalusian region. Andalusia has over 1,100,000 dairy goats, representing approximately 40% of the national census. With over 235 million liters of milk, it is the largest producing area, with 50% of the Spanish production, which shows the importance of this species in Andalusia.

The main objectives of the Federation are:

- The representation, management and defense of the particular interests of the associations which is comprises, representing them in meetings that are conducted to collective bargaining, the approach of collective labor disputes, social dialogue and institutional participation in public organizations within labor administrations.
- The conservation and improvement of the goat breeder associations that constitute it.
- Promoting goat breeds represented.
- Access to all types of grants of local, provincial, regional and national character and in the European Union aimed at the preservation, enhancement and promotion of goat breeds in question.
- Promote professional, educational and cultural development in order to maintain and increase the level of preparedness and operational efficiency, optimizing the communication vehicles and systems around us.
- Contribute to the defense and promotion of economic and social interests which they represent.

CABRANDALUCIA develops many activities to achieve such objectives. Probably the most important is the organization of the Spanish National Goats Forum (www.cabrandalucia.com), which every year gathers specialists in goat production systems from many parts of the sector: farmers, nutritionists, veterinaries, cooperatives, policy makers, etc. This year the forum was held in Seville and dealt with issues such as the challenge of addressing aflatoxin contamination in feeds and milk and the opportunity in the sector to expand in new markets such as China and India, where an increasing demand of goats milk is occurring.
As part of the SOLID project CABRANDALUCIA´s role involved assisting and working together with colleagues at CSIC to undertake the rapid assessment tool as an exercise to evaluate the sustainability of ten dairy goat farms in Andalusia. This also included holding two farmers' meetings to discuss the outcomes from the assessment and to identify future research priorities within the project. As a result, CABRANDALUCIA and CSIC organized a one day workshop on 'Nutritional strategies for the Dairy Goat sector' at the Institute of Animal Nutrition (CSIC, Granada, 12 March 2013) where 125 people (including farmers, advisors, scientists and local policy makers) attended. We are currently involved in conducting the on-farm trials as part of WP 1 and 3 to evaluate the feasibility of introducing agro-industrial by-products in dairy goat feeding.

Brief News from SOLID



Participatory on-farm research

Work package 1 in SOLID has used participatory on-farm research to a very great extent. The topics for the on-farm projects range from homegrown protein sources, biodiversity and alternative feeds to grazing behavior, milk yield and climate friendly organic milk production. The topics were identified jointly with farming stakeholders. Priority was given to topics that were suitable for research involving farmers and to topics that were of importance to the SOLID project.

On www.solidairy.eu, you can see a brief presentation of the on-going participatory work in each country.

EAAP 2014 in Copenhagen Denmark

The 65th Annual Meeting of the EAAP will take place in Copenhagen from 25th to 29th August 2014. A main theme of the meeting will be "Quality in Animal Production" dealing with product quality as well as resource efficiency, sustainability, animal welfare and agro-ecology. Several of the scientific sessions are of interest to the organic livestock sector, while one is related directly to organic production:

Session 11: Organic livestock farming – challenges and future perspective.

For program and more information visit www.EAAP2014.org.

Future Dairy Workshop

What are the main challenges of milk production and processing in Europe? How can milk chain actors maintain and promote their competitiveness and sustainability in the future? What are the special characteristics of the milk supply chain related to geographical diversity and what can we learn from each other?

About 25 participants from European countries will discuss the questions above in the SOLID Future Dairying Workshop. Dairy farmers or representatives of farmers' associations and/or dairy companies, who would like to join at their own expense are welcome (limited places available).

When: May 20- 21 2014, starting at 12:00
Where: Rantasipi Airport Congress Center, Vantaa Finland

In the workshop, participants will work in groups to identify the challenges in the milk supply chain and develop innovative solutions to achieve desired future outcomes. The Workshop will begin May 20th at 12 with registration and will be completed by lunch time the next day. It is organized by MTT Agrifood Research Finland.

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