

## Obstacles and solutions for the organic milk production in Italy

Giacomo Pirlo<sup>1</sup>, Susanna Lolli, Simone Cogrossi, Paolo Bani, Luciano Pecetti,  
Beatrice Di Renzo, Simone Severini

**Key words:** milk, forage, protein feed, economics

### Abstract

*Preliminary results of a study concerning technical and economic aspects of organic milk production in northern Italy are presented. A survey on characteristics of organic dairy farms showed wide variation in size, productivity, and forage systems. Crimson clover and hairy vetch were used as cover crops in maize cultivation to improve feed availability. Both legumes showed effective contrast of weeds in the early crop stage, but also inconsistent maize yield results. Alfalfa silage can increase protein feed self-sufficiency of organic dairy farm without detrimental effects on milk productivity and quality. Comparing two organic farms, the best economical performances were observed in the larger one. On the other hand the smaller one appeared to be more flexible because it also exploits other activities based on agro-tourism services.*

### Acknowledgments

The Project VaLatteBio was funded by the Italian Ministry of Agricultural, Food and Forestry Policies.

### Introduction

In Italy, organic milk consumption had a major increase from 2011 to 2015 (SINAB 2016) due to a consumers' higher sensitivity to food safety and ethics of food production, particularly in the animal sector. Despite this trend and the wide difference of price between organic and conventional milk, only approximately 2.6% of dairy cows are raised according to the organic system in Italy (SINAB 2016). There are a number of technical and economic factors hindering the increase of organic milk production and the Italian Ministry of Agricultural, Food and Forestry Policies funded the project VaLatteBio (Guidelines for organic milk production and feasibility of conversion) to overcome these obstacles. The project encompasses four different sub-projects: 1) technical and environmental analysis; 2) feed production; 3) improvement of self-sufficiency of protein feeds; and 4) economic analysis. Aim of the project is to provide dairy farmers with guidelines facilitating the conversion to organic milk production and some of its preliminary results are reported in this paper.

### Material and methods

Technical and environmental analysis. The technical and management characteristics of a sample of six organic dairy farms in Lombardy, i.e. the Italian region with the largest number of dairy cattle, were gathered by face-to-face interviews. Feed production. This sub-project consisted of a pilot trial on the adoption of cover crops on maize cultivation to improve weed control with no mechanical operation. The legume species crimson clover and hairy vetch were used as cover crops to be terminated by roller crimping in spring prior to maize sowing. Improvement of self-sufficiency of protein feeds. In an organic dairy farm, alfalfa silage was introduced in the ration of 80 dairy cows replacing wheat silage and part of high-protein concentrates of the control diet, to improve the self-sufficiency of organic dairy farms. The effects on milk production, milk quality, and animal health were monitored. Economic analysis. It was conducted in two organic farms

---

<sup>1</sup> Council for Agricultural Research and Economics (IT), [www.entecra.it](http://www.entecra.it), eMail: [giacomo.pirlo@crea.gov.it](mailto:giacomo.pirlo@crea.gov.it);

where detailed accounting were available and characterized by different size and strategies, to estimate their economic performances and robustness under different scenarios of milk price and subsidy levels.

## Results

The current results refer to the first year of the project VaLatteBio and should still be considered as preliminary. Although a small number of organic dairy farms under examination, this sample can be considered representative, because of the low proportion of organic farms currently operating in Lombardy.

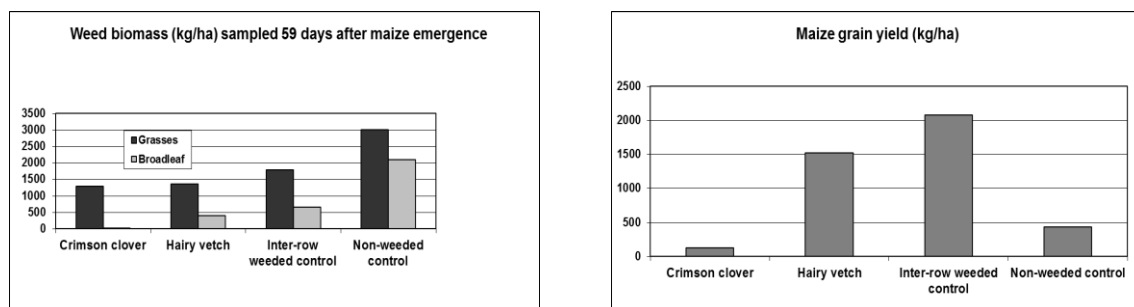
The main characteristics of these farms are reported in Table 1.

**Table 1: Main characteristics of organic milk farms**

	Unit	Mean	CV (%)
Cultivated area	ha	190.4	91.4
Dairy cows	n	174.2	86.3
Milk production	kg FPCM/yr head <sup>-1</sup>	7736	18.0
Protein	%	3.38	4.8
Fat	%	3.90	3.1
Maize	% on total cultivated land	20.0	87.0

FPCM: fat-protein corrected milk

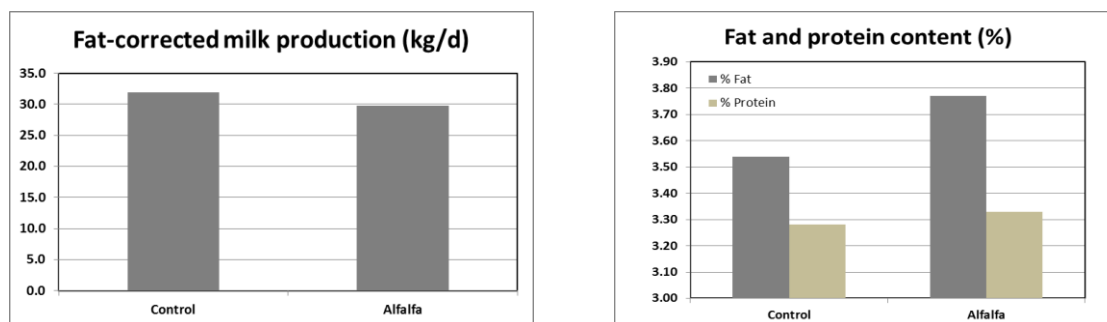
Cattle are on pasture for a short period and total mixed ration is the most adopted feeding system. Maize is a key crop, but there is a wide variation in its proportion of cultivated area. Only in one case are cattle fed fresh herbage all year round. Most of the concentrates are imported from the international market, because domestic feed production is not sufficient to satisfy the organic demand.



**Figure 1. Weed control and maize grain production with two cover crops, relative to mechanically weeded and non-weeded check treatments.**

Cover crops were comparable in weed control to the mechanically weeded check. However, no treatment seemed to be effective in controlling summer grass infestation, mostly including Johnson grass (*Sorghum halepense*), which may have hindered maize grain yield regardless of treatment. Nonetheless, maize yield results on hairy vetch were in line with those in the mechanically weeded check treatment. On the contrary, maize yield on crimson clover was unsatisfactory despite an appreciable weed control, suggesting possible negative effects by this legume species towards

maize (e.g., excessive soil water depletion; unsatisfactory soil structure; competition of rolled mulch towards emerging maize plants).



**Figure 2. Effect of the substitution of wheat silage with alfalfa silage on fat-corrected milk production and milk composition (g/100 g).**

The results of experiment where two iso-energetic and iso-nitrogen diets were compared are reported in Figure 2. When alfalfa silage was increased in the diet, milk production was reduced whereas milk fat percentage increased and production of fat-corrected (4%) milk was only slightly ( $P < 0.10$ ) reduced.

The main characteristics of the two organic farms examined in the economic analysis are reported in Table 2.

**Table 2. Main characteristics of the two dairy farms considered in the economic analysis.**

	Unit	Farm A	Farm B
Cultivated area	ha	260	45
Cows	n	300	45
Total milk production	t/yr	2818	333
Average milk production	kg/cow yr <sup>-1</sup>	9390	7400
Maize cultivation	% of the total area	40.0	12.0
Alfalfa	% of the total area	40.0	8.0
Grassland	% of the total area	3.0	34.0
Other silages	% of the total area	13.0	31.0
Total revenues	€ 000	1945	280
Contribution of EU subsidies	% of the total revenues	9.1	13.5
Contribution of other activities	% of the total revenues	0.17	20.0

These farms strongly differ in terms of size and production intensity. Farm A is larger and has a higher milk production per cow than farm B. Furthermore, these farms pursue two different strategies, namely: 1) aiming to increase the efficiency in feed resources, labour, and capitals, as in farm A; and 2) developing other activities based on ecological services that organic production can promote, as in farm B. Both farms result economically sustainable even if farm A reaches an higher remuneration of own capital. Because of this, farm A appeared to be more tolerant in case of reduction of milk price or EU subsidies.

## **Discussion**

This survey has given an initial snapshot of organic milk production in an important dairy area of Italy. These preliminary results show that organic dairy farms in northern Italy have different characteristics and strategies. In most of them, maize is a key crop, but its cultivation remains difficult without chemical weed control, although the tested cover crops were able to limit broadleaf weeds in the early crop stages. Alfalfa silage is a resource that can increase the self-sufficiency of organic dairy farm, without reducing milk production or quality. Nevertheless, particular attention is needed to the protein degradability level of the whole diet to optimize its use in large amounts in lactating dairy cows. Organic dairy farms in the study area have a good profitability level. However, economic results are influenced by other factors including farm size and productivity. According to our data, the larger and more productive farm performs better. Smaller organic dairy farms can reconcile milk production with other activities, such as provision of agro-tourism services, allowing them to be relatively less affected by possible future reduction of milk price.

## **References**

SINAB, 2016. Bio in cifre. Available at [www.sinab.it](http://www.sinab.it). Accessed on 1<sup>st</sup> March 2017.