Farm-specific development plan: a tool to manage and improve individual dairy farms

Kohnen H.[1], Boonen J.[1], Van Vliet G.[2] and Wengler F.[1]
[1]Lycée Technique Agricole LTA, Luxembourg; [2]Institute Organic Farming IBLA, Luxembourg

Abstract

Pilot farm networks are very efficient in developing and implementing innovative measures and strategies to improve farm performances. At farm level, their specificities must be considered. A coordination of all actors, i.e. researchers, advisors, farmers and policy makers is essential. During the EU Dairyman project a strategy has been elaborated to establish coherent development plans. This method is applied on the four Luxemburgish commercial monitor farms, which are a part of the 'Autograssmilk' EU project with a farm network. Three steps have to be respected: (1) a detailed farm description; (2) a definition of objectives and their corresponding indicators; and (3) an implementation of a strategy, sub-divided into several actions. Farm data were collected and analysed during 2014, so that at the end of the year a specific development plan was elaborated on each farm. Due to the farm-specific approach, for identical farm objectives, concrete actions to reach the goal can differ significantly. Furthermore, the coordination between involved organizations is enhanced. The results were as positive as in the previous project and its seem therefore that they can be replicated. The method can be considered as an appropriate tool to monitor and improve commercial farms.

Keywords: dairy farm network, farm-specific development plan, grazing, automatic milking

Introduction

The key factors of the EU rural development strategy are: bottom-up approach, networking with multi-sectoral integration, and development of local solutions by implementing innovative tools and methods. Pilot-farm networks satisfy most of these objectives. Working with pilot-farm networks is a very efficient way to develop and implement innovative development at farm level. All activities of involved researchers, advisors, farmers and policy makers must be coordinated in order to realize coherent improvement at farm level. During the EU-Dairyman project (2009-2013) a strategy has been elaborated that allows the setting up, execution and documentation of a specific development plan on each of the 130 pilot farms in 10 regions in North-west Europe (Dairyman, 2013).

The convincing success of the approach used in this project led to its application as a tool on the 4 Luxemburgish monitor farms of the EU Autograssmilk project (Autograssmilk, 2013-2015) with the expectation of confirming its efficiency and to establish it as a standard approach for use in Luxemburgish farm advisory work.

Materials and methods

The network

The monitor farms network is part of the Autograssmilk project, in which research institutes from seven countries (joint project in Ireland, France, Belgium, the Netherlands, Denmark and Sweden, Luxembourg since 2014) cooperate, with the aim of combining automatic milking systems (AMS) and grazing. Data from 37 dairy farms equipped with AMS were selected to assess their performance. The Luxemburgish partner is a FILL initiative (association for sustainable farming Luxembourg) where four organisations (LTA – agricultural school; SER – service for farm accounting; ASTA – governmental agricultural support; Convis – farm advisory) collaborate. Since the Luxembourgish government does not have its

own agricultural research facilities, this study has been performed on four commercial monitor farms. Due to the participation criteria (a combination of grazing with AMS) these farms do not represent the Luxemburgish average farm. The short time period of the project (2014-2015) imposed a strict time schedule. During 2014, data on farm settings, such as economic situation and nutrient (N, P) flows, were collected following a methodology developed in the Dairyman project (Dairyman, 2013). Additionally, a daily feeding and grazing calendar (Kohnen, 2009) provided information about fodder intake. As combining grazing and AMS poses a high demand on farm layout and infrastructure to assure good cow traffic and high milking frequency, an external survey was conducted on all farms by a specialised enterprise (Grasstec Ltd., Ireland) during October 2014.

All farms are mixed farms and produce dairy and/or beef or cereals. The grazing period starts during April and ends in October with all-year feed supplementation and calving. During the grazing season, grass-silage feeding is reduced or stopped, whereas maize silage and concentrates are fed all-year round. Farms differ in grazable area, total milk production and milk yields. The farm LU1 (organic) has no maize. AMS saturation is actually low, but with abandonment of the milk quota system, all farms plan to increase milk production (Table 1) and so AMS will be saturated. High standards are needed for tracks and farm layout to assure cow traffic and the milking frequency of the cow herd. Therefore, cow traffic and tracks must be improved.

The tool

The Dairyman approach (Dairyman, 2013) can be considered as a tool to elaborate and implement farm improvement plans in order to help farmers take strategic decisions to improve their farm performances, respecting regional and farm specificities. Three main steps have to be respected: (1) description of farm performances, (2) definition of the objectives and their indicators and (3) implementation of a strategy by sub-dividing the objectives into several actions and involving farm advisers (Grignard A. 2012). The number of objectives should be limited to avoid congestion.

Due to the Autograssmilk objectives, all improvement planning (Figure 1) focuses on grazing and automatic milking.

Results and discussion

For all farms, a specific development plan was realized in winter 2014-2015. Objectives and actions differed greatly among farms. As LU1 has a relatively low grazing area, the farmer aims to improve forage

Table 1. Farm characteristics based on data registration 2013.

Farm		LU1	LU2	LU3	LU4
Grazable area (dairy only)	ha	11.5	40	12	22.6
Milk produced in 2013	Mg yr^{-1}	178	253	660	392
Milk expected in 2016	% of 2013	10	100	10	0-10
Dairy cows in 2013		56	35	85	60
Dairy cows in 2016		56	80	95	70
Cow per grazable area	cows ha^{-1}	5.1	0.9	7.1	2.7
Poaching risk		low-local	medium	low	high-extreme
AMS units[1]	number	1	1	2	1
AMS saturation	Mg milk AMS^{-1} y^{-1}	178	253	330	392
Grass intake in 2014	kg dry matter c^{-1} d^{-1}	5-10	12-16	<5	10-12
Selection gate		exit AMS	exit AMS	gate exit barn	exit AMS

[1] AMS = automatic milking system.

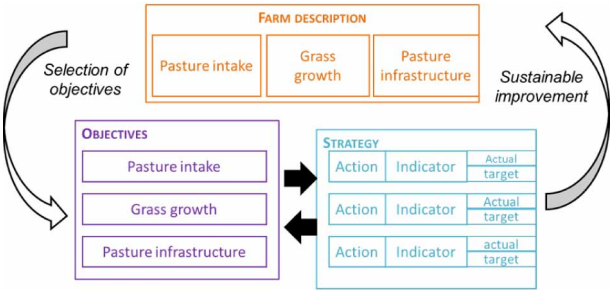

Figure 1. Schematic representation of the steps and elements required to establish a comprehensive farm development plan for farm monitoring of the Luxemburgish Autograssmilk project.

Table 2. Example of a development scheme (farm LU4) with farm objectives, concrete actions with indicators (actual and target).

Objective	Action	Indicator	Actual	Target
Increase grazed grass intake	• Improve cow track • Rearrange paddocks	Total fresh grass intake per year	130 Mg dry matter yr^{-1}	>150 Mg dry matter yr^{-1}
Increase AMS[1] saturation	• Install double cow track • Day-night paddocks	Milk production per AMS	350 Mg AMS^{-1}	500 Mg AMS^{-1}
Reduce fluke risk	Avoid poaching Strategic treatment dry off	Number of infections	100%	0%

[1] AMS = automatic milking system.

and protein supply during grass shortage by fresh-grass indoor feeding of temporarily produced grass-clover crops. LU2's dairy herd size will double; therefore the farmer is willing to change the farm layout and double the cow tracks in order to improve cow traffic and achieve a high AMS saturation with high pasture intake. LU3 will optimise grass intake by daily adapting the feed supply during the grazing season. A more detailed development plan for farm LU4 is described in Table 2.

Conclusions

The dairyman methodology provides good results even in a network as specific as Autograssmilk. Respecting farm specificities by defining actions with the corresponding indicators are key features. Involving farmers and their advisers during the whole process enhances long-term results even beyond the project's end. The novice partners inside the working group adopted the method without any apprehension.

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