

BELLIMPRESA



Actions to optimize internal resources and to spread entrepreneurial culture for the multifunctionality and economic sustainability of dairy farms

Bando pubblico 02-2009: Bellimpresa – Razionalizzazione delle risorse interne e diffusione di una cultura di impresa mirate alla multifunzionalità ed alla sostenibilità economica delle aziende zootecniche.

Javna objava 02-2009: Bellimpresa – Racionalizacija notranjih virov in razširitev dobre rejske prakse, nanašajoče se na multifunkcionalno in trajnostno gospodarjenje na živinorejskih obratih.

Bruno Stefanon - University of Udine
Bled, 2014, July 14



**DISA - Dipartimento di Scienze
Agrarie e Ambientali - Università
Università degli Studi di Udine**



2007-2013

cooperazione territoriale europea
programma per la cooperazione
transfrontaliera

Italia-Slovenia

evropsko teritorialno sodelovanje
program čezmejnega sodelovanja

Slovenija-Italija



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Progetto cofinanziato dal Fondo europeo di
sviluppo regionale

Projekt sofinancira Evropski sklad
za regionalni razvoj

Main objective of the project

- *Identify Strengths and Weakness of Italian and Slovenian dairy farms*
- *Increase the business awareness of farmers to change livestock farm into enterprise*
- *Build up a transfrontalier network of farms to promote and commercialize dairy products either from organic or conventional farms*

*soluzioni per la sostenibilità dell'allevamento
rešitve za trajnostno živinorejo*

Specific aims and activity

- 1) Depict a frame of managerial and productive characteristics of dairy farms in the transfrontalier area
- 2) Consider strenghts and weakness of dairy farms, within the conditionality: environmental protection, animal health and welfare, safety at work
- 3) Build up a dialogue among researchers, producers, consortia and istitutions to understand specific requirements, priorities and strategic actions to stimulate opportunities for the development of the area and to valorize local products
- 4) Develop an entrepreneural culture in the dairy farms, through managerial strategies (software for economic management, training courses) and published guidelines
- 5) Build up and Italian-Slovenian network for the promotion and commecrialization of dairy local products, also with a parteciaption to local events (Friuli Doc, Fair of Gemona «Cheese and around», Fair of Tolmin), common marketing strategies, specific transfrontalier brands, supported by a dedicated website (<http://bellimpresa.uniud.it/>) to show and per advertising dairy farms and dairy products

Project organized in WORKPACKAGES

WP1 - Management and coordination of activities

WP2 - SME management and economy

WP3 - Support to the means of production

WP4 - Market identification and definition

WP5 - Distribution and commercialization

WP6 - Training and spreading of entrepreneurial culture

WP7. Dissemination and communication

Some critical point of dairy farms

- *High production costs (feedstuffs, energy)*
- *Low milk price*
- *Insufficient soil (UAA) and low feeding self-sufficiency*
- *High stocking rate (head/ha)*
- *Not optimal productive efficiency*
- *Supposed high environmental impact*

soluzioni per la sostenibilità dell'allevamento
rešitve za trajnostno živinorejo

Opportunity for next generation dairy farms

- *High quality safe food, environmentally sustainable, in a cost-effective way and socially acceptable*
- *Consumers' willingness-to-pay for high quality products with lower environmental impact and better animal welfare standards*

BELLIMPRESA
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Supporting SME dairy farms. Why ?

- **Long-term Environment sustainability**
 - Land degradation and loss of biodiversity
 - Reduction of fertilizer and pesticides
- **Long-term economic sustainability and competitiveness**
 - Sustainability and resilience: multifunctionality
 - Organic system as an example, within EU regulation (2092/91; 834/2007)
 - Production systems (resources)
- **Co-existence with conventional production systems**
 - Traditional (still conventional ?) farming
 - Social, cultural, economic, ecological integration of landscape with agriculture

Management and farm economy

- *Acquiring systematic information to know the actual situation of dairy farms in the transfrontalier region (interview and questionnaire on 155 Italian and Slovenian farms)*
- *Data computing to investigate Strengths and Weakness*
- *Analysis of profit and loss account for a sub-sample of dairy farms*
- *Definition and implementation of software for economic management of farms, supported by dedicated on-farm meetings to train farmers*

To be completed:

- *Training course in business plan*

Support to the means of production

- *Study of biomarkers for animal welfare and environmental sustainability in 5 dairy farms*
- *Analysis of milk quality, feedstuffs and diets (53 Italian farms and 59 Slovenian farms 59; 450 milk and feed samples)*
- *Software for environmental sustainability, to calculate green house gasses (GHG) emissions using data from stable, herd and rations*
- *Software for animal welfare to rank farms using data from stable, herd and rations*
- *Identification of biomarkers in blood and milk for the assesement of animal welfare and health*

To be completed

- *Reports of activities and guidelines*

The environmental sustainability issue

EU Climate Energy Package (443/2009)

Reduction of 20% of CO₂ emissions

Livestock production: from 3 to 18% of total CO₂ emissions

(Green House Gasses – GHG)

Support to the means of production

Mitigation of CO2 emissions: Not only an environmental issue

Reduction of methane fermentation increases feed efficiency

Longevity and reproduction traits reduce GHG (to -25%)

Health and welfare reduce GHG (to -8%)

Reducing age at first calving, culling rate decrease GHG

Moreover:

Reduction of wastes and associated costs

Reduction of costs of energy

Support to the means of production

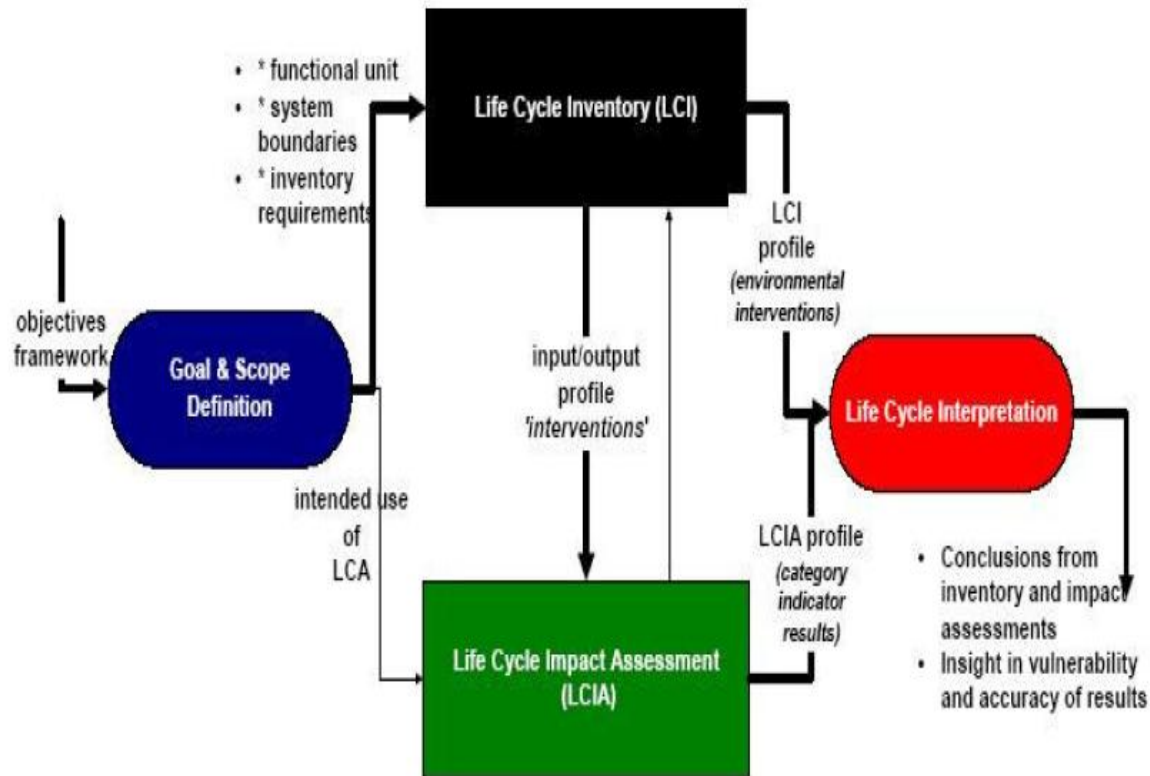


Figure 3.1: Modified LCA structure from ISO 1997a (Rene van Berkel, 2002)

LCA

*Life Cycle
Assessment for
GHG emissions:*

Carbon foot print



Support to the means of production

LCA - Life Cycle Assessment

Comparison among different production systems

Assessment of environmental impact of each stage of the life for a product or a production system

Reduction of costs, using sensitivity analysis and appropriated interventions

ECOLABEL: can be used for marketing, to obtain competitive advantages

Environmental Budgeting: Emissions and use of resources are under control

Support to the means of production

Software to calculate Carbon foot print

Guidelines for National Greenhouse Inventories - 2006
(Intergovernmental Panel on Climate Change - IPCC)



CH₄ → Enteric fermentation

CH₄ → Manure management

N₂O → Manure management

N₂O → Soil and fertilizers

CO₂ → Land use and Land use change



Support to the means of production

Greenhouse gas emissions (Kg CO₂-eq for kg of FPCM) from enteric fermentation and manure management in Italian and Slovenian dairy farms

		mean	sd	Sig of P
CO ₂ -eq from EF	<i>Italy</i>	1.25	1.10	ns
	<i>Slovenia</i>	1.53	0.70	
CO ₂ -eq from Manure	<i>Italy</i>	0.69	0.49	0.02
	<i>Slovenia</i>	1.06	0.83	
Total CO ₂ -eq	<i>Italy</i>	1.94	1.54	0.03
	<i>Slovenia</i>	2.54	1.48	

Greenhouse gas emissions (Kg CO₂-eq for kg of FPCM) from enteric fermentation and manure management depending on cows breed

		mean	Sd	Sig of P
CO ₂ -eq from EF	<i>Holstein Friesian</i>	1.14	0.39	0.032
	<i>Simmental</i>	1.21	0.49	
	<i>Brown Swiss</i>	1.66	1.41	
CO ₂ -eq from Manure	<i>Holstein Friesian</i>	0.86	0.46	ns
	<i>Simmental</i>	0.71	0.55	
	<i>Brown Swiss</i>	0.98	0.86	
Total CO ₂ -eq	<i>Holstein Friesian</i>	2.00	0.82	ns
	<i>Simmental</i>	1.93	1.01	
	<i>Brown Swiss</i>	2.58	2.13	

Support to the means of production

Greenhouse gas emissions (Kg CO₂-eq for kg of FPCM) from enteric fermentation and manure management depending on farming system

		mean	sd	Sig of P
CO ₂ -eq from EF	<i>Intensive</i>	1.06	0.22	0.000
	<i>Not intensive</i>	1.69	1.29	
CO ₂ -eq from Manure	<i>Intensive</i>	0.66	0.21	0.002
	<i>Not intensive</i>	1.03	0.91	
Total CO ₂ -eq	<i>Intensive</i>	1.72	0.29	0.001
	<i>Not intensive</i>	2.67	2.08	

Support to the means of production

Adeguacy of diets to requirements (from 155 dairy farms)

FCM PRODUCTION CLASSES	DMI		Forage to Concentrate ratio DM basis		Energy supplied/Energy requirements	Protein supplied/ Protein requirements
ITA	Mean	sd	Mean	sd	%	%
< 20 kg/head d	18.03	1.88	62.71	12.74	21	19
20-30 kg/head d	19.20	2.26	55.35	11.46	9	2
>30 kg/head d	19.84	1.23	51.57	5.96	-4	-14
SLO						
< 20 kg/head d	18.03	1.88	78.33	9.52	-7	-2
20-30 kg/head d	19.20	2.26	79.36	11.75	-18	2

Support to the means of production

Animal welfare: an issue complex and matter of debate

The World Organization for Animal Health defines an animal as being in good animal welfare if it is “healthy, comfortable, well nourished, safe, able to express innate behavior and is not suffering from unpleasant states such as pain, fear and distress”(World Organization for Animal Health. 2008).

There are different definitions of welfare and there are therefore also different approaches to the study

The aim of this work is to create a simplified model for the calculation of welfare, with a double purpose:

- To realize a study to define variable to be used in the field*
- To provide the farmer simple rapid tools for the control of welfare level*

Support to the means of production

The identified model needs (Calamari and Bertoni, 2006), considers 3 clusters: Nutrition, Breeding, Animal, (total score of 100)

Cluster NUTRITION:

Type of feeding (traditional/unifeed)

Regularity of food analysis

Distinct plans of nutrition
(dry / lactating cows)

Forage/concentrate ratio

Adequacy of Energy and Protein
requirements

Number and cleanliness of troughs

PARTIAL SCORE: 30

Cluster BREEDING

Head/ha, Use of pasture

Unexpected or constant noise

Free or tie stalls

Type and quantity of bedding

Measure of bedded

Ventilation system

Milking system

Freedom of movement in the
external area

Animal cleanliness

PARTIAL SCORE: 30

Cluster ANIMAL

AI for conception

Days open

Milk fat to protein ratio

Milk Urea

Somatic Cells Count

Animal diseases

Body condition scores

Rumination time

Fecal score

Milk yield

Stereotypes/Agonism

Quality of social behavior

Relationship man-animal

Behaviour at rest

PARTIAL SCORE: 40

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Welfare Classes, according to score

High welfare level	81-100
Sufficient welfare level	61-80
Low welfare level	41-60
Lack of welfare	<40

Support to the means of production

Welfare level	N. of Farms
Lack	0
Low	27
Sufficient	57
High	0
Total Farms	84

Some results from a sub-set of farms

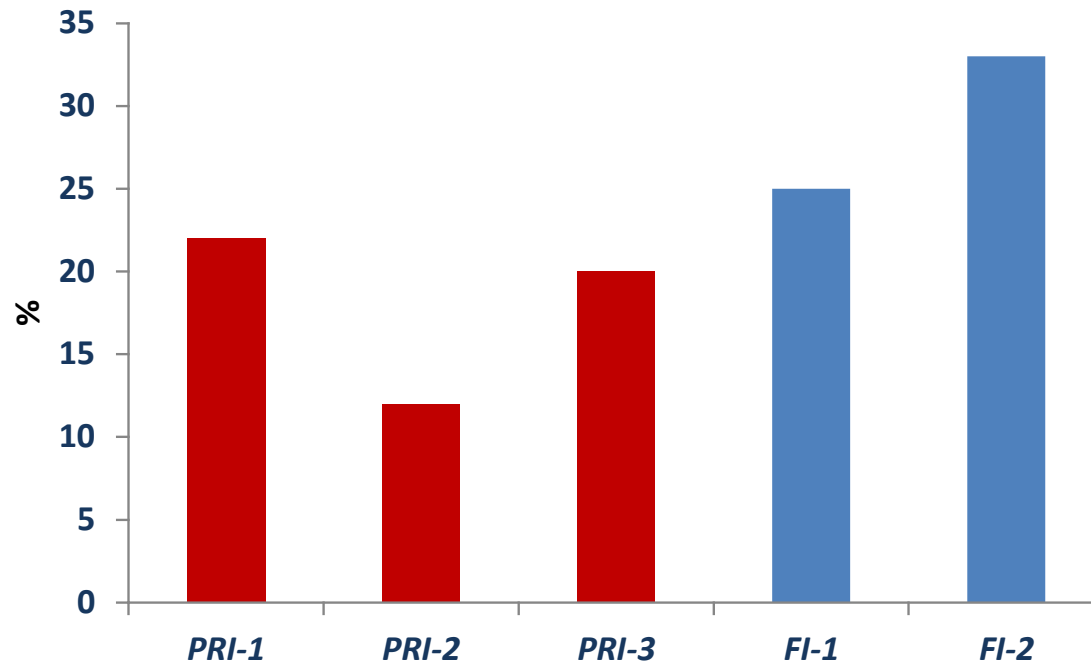
Welfare level	CLUSTER		
	Nutrition	Breeding	Animal
Lack	24	14	0
Low	42	42	3
Sufficient	14	26	53
High	4	2	28
Total Farms	84	84	84

Support to the means of production

Study in dairy farms to assess biomarkers of welfare and health

Among the other, milk cortisol can be proposed to define the level of welfare

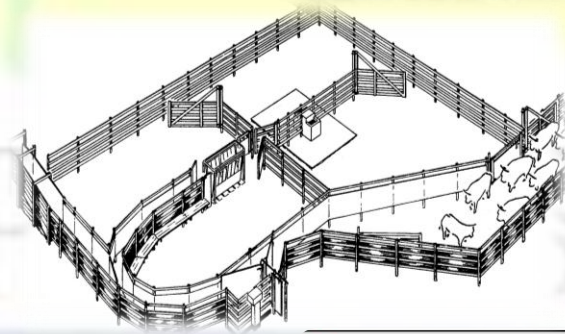
Percentage of lactating cows with milk cortisol (pmol/ml) above the third quartile of the whole population



Support to the means of production

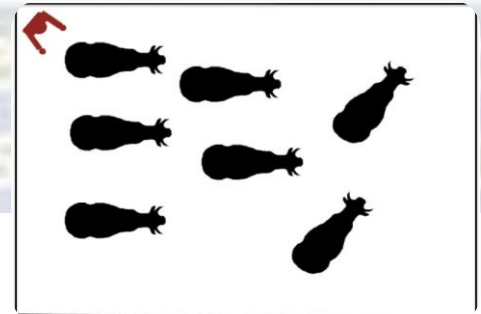
Farm management and safety at workplace

- I. Low risk perception***
- II. Critical points in the management of agricultural machinery***
- III. Absence of training of workers***



Results

- I. Analysis of the levels of safety in the farms**
- II. Cost analysis for the adjustments**
- III. Creation of guidelines for a safety planning**

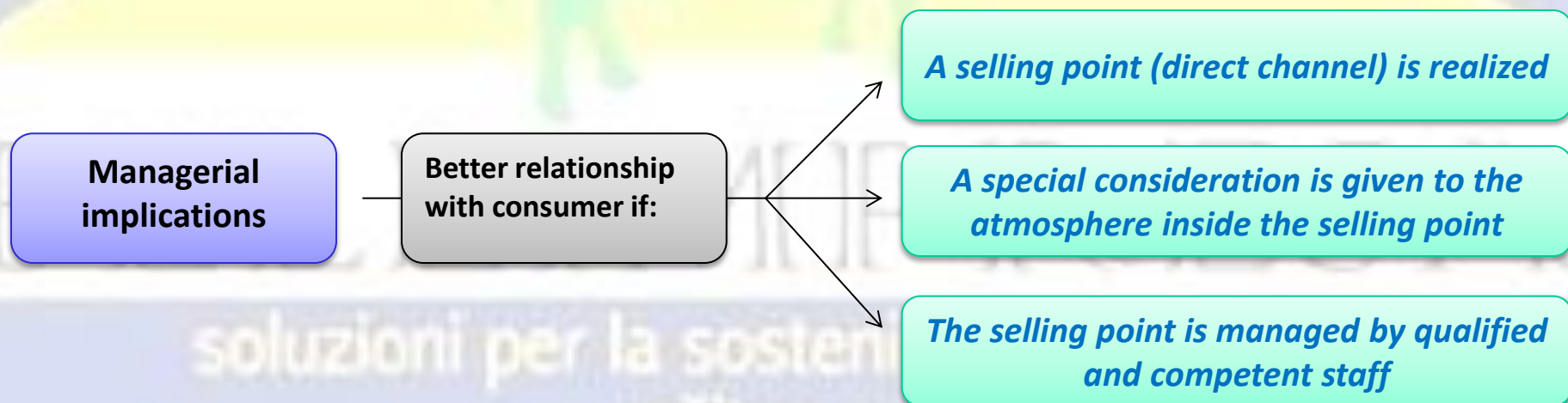


Identification of market, distribution and commercialization

Case studies in 10 local farms to define offer, income distribution, procurement and storage, logistic and client portfolio management

Interview of 500 customers to investigate sale modalities and packaging for local dairy products

Analysis of data and identification of customer's expectations



New Added values of dairy products



Labeling products for:

- **Environmental sustainability: Carbon Foot Print**
- **Animal health and welfare: Check list for welfare score**
- **Safety at workplace: Guideline and check list**
- **Quality of local dairy products: Integration of farms with landscape**

Training and spreading the entrepreneurial culture

- *Course for the use of «BELLIMPRESA€con» software for the economic management of dairy farms*
- *Visits in farms, to support farmers in the use of software*
- *Meetings to present profit and loss account of farms to farmers*
- *Course for safety at work of dairy farms*
- *Annual exchange visits of Italian and Slovenian farmers to farms, cheese maker units and dairy shops, to stimulate networks among farms for the commercialization of local products*

To complete:

- *Further exchange visits among farmers*
- *Meeting with institutions and associations to build networks in the transfrontalier area*
- *Course for the preparation of business plan*
- *Dedicated website for marketing and commercialization of local products*

Dissemination and Communications

Dissemination through Italian and Slovenian meetings

- *Friuli DOC – UDINE, 2013*
- *Formaggio e dintorni – GEMONA, 2012 and 2013*
- *Agricultural Fair – TOLMINO, 2012 and 2013*

- Website

To complete

Report of activities

Guidelines for:

- Use and management of safety at work in farms
 - Farm management: breed, feeding, GHG, quality of products
 - Marketing and commercialization
- Gemona fair, 2014, Tolmino fair 2014 and Agriest fair 2015*
- Final meeting – February 2015 University of Udine*



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Slovenija-Italija 2007-2013 iz sredstev Evropskega sklada za regionalni razvoj in nacionalnih
sredstev*



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