LIFE
The Tough
Get Going

LIFE The Tough Get Going project: improving the efficiency of the PDO cheese production chains by a dedicated software

LIFE 16 ENV/IT/000225 – LIFE TTGG
ENVIRONMENT - RESOURCE EFFICIENCY

LENS CONFERENCE

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POLITECNICO DI MILANO - Italy

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GRANA PADANO

POLITECNICO
MILANO 1863

Life

Introduction

The European Union (EU) has mentioned that **in the near future** companies will be able/will have to communicate the environmental footprint on their product labels (Roadmap to a Resource Efficient Europe. European Commission, 2011).

European Commission

PEF

A B C D E

BETTER AVERAGE WORSE

Partnership and budget

BUDGET : 2,148,987 € (EU contribution 1,270,869 €)

DURATION : 4 years (July 2017 – June 2021)

COORDINATOR: Department of energy - Politecnico di Milano

RESEARCH INSTITUTIONS:

POLITECNICO MILANO 1863

UNIVERSITAS CATHOLICA SACRI CORDIS JESU MEDIOLANI

OTHER PARTNERS:

GRANA PADANO

Cniel – Centre national interprofessionnel de l'économie laitière

oriGIn

ENERSEM

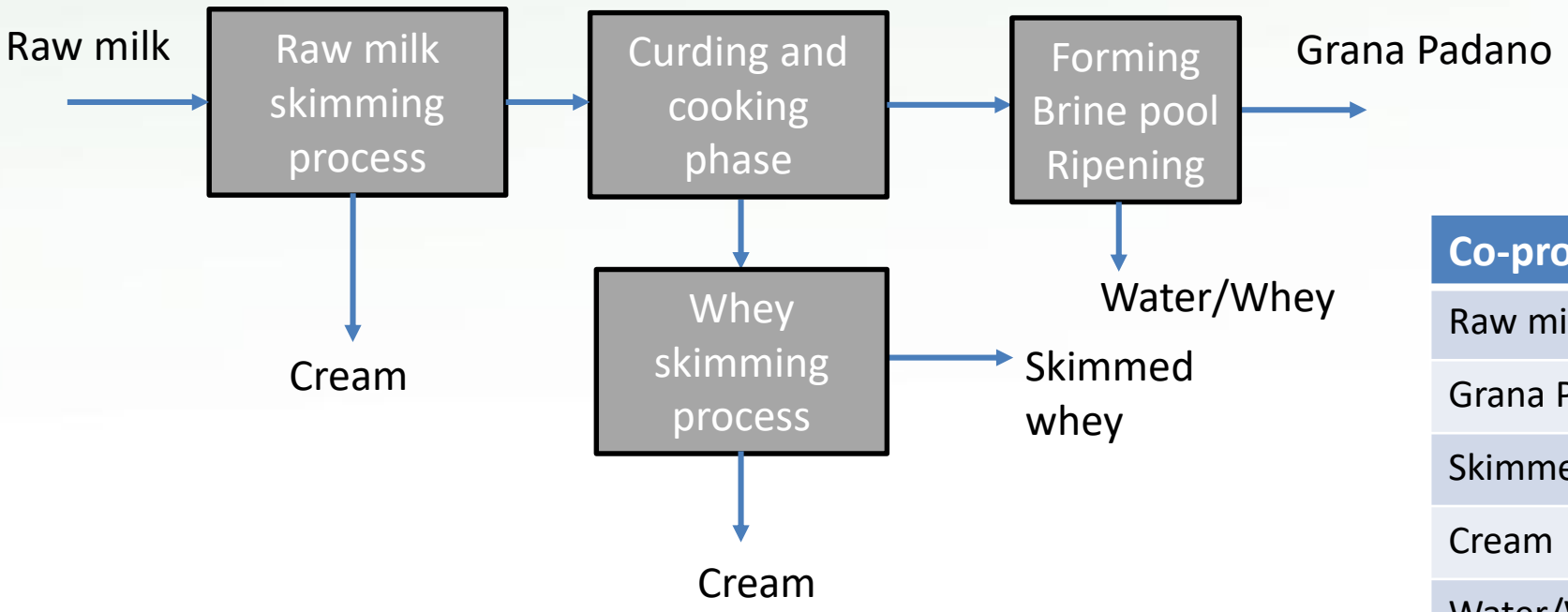
QUALIVITA

Functional unit

10 g dry matter of cheese, consumed at home as a final product without cooking or further transformation (PEFCR Dairy products, The European Dairy Association, 2018).

System boundaries

Life Cycle Inventory- Mass balance



Co-products	Mass	Dry matter
Raw milk	13.83 kg	12.3%
Grana Padano	1.00 kg	67.5%
Skimmed whey	11.64 kg	6.40%
Cream	0.99 kg	26.0%
Water/Whey	0.17 kg	0.0%

Life Cycle Inventory – The datasets

Data per 1 kg of Grana Padano (allocations between whey and cream were included).

Allocations	
Co-products	**%**
Grana Padano	40.2%
Whey	44.4%
Cream	15.4%

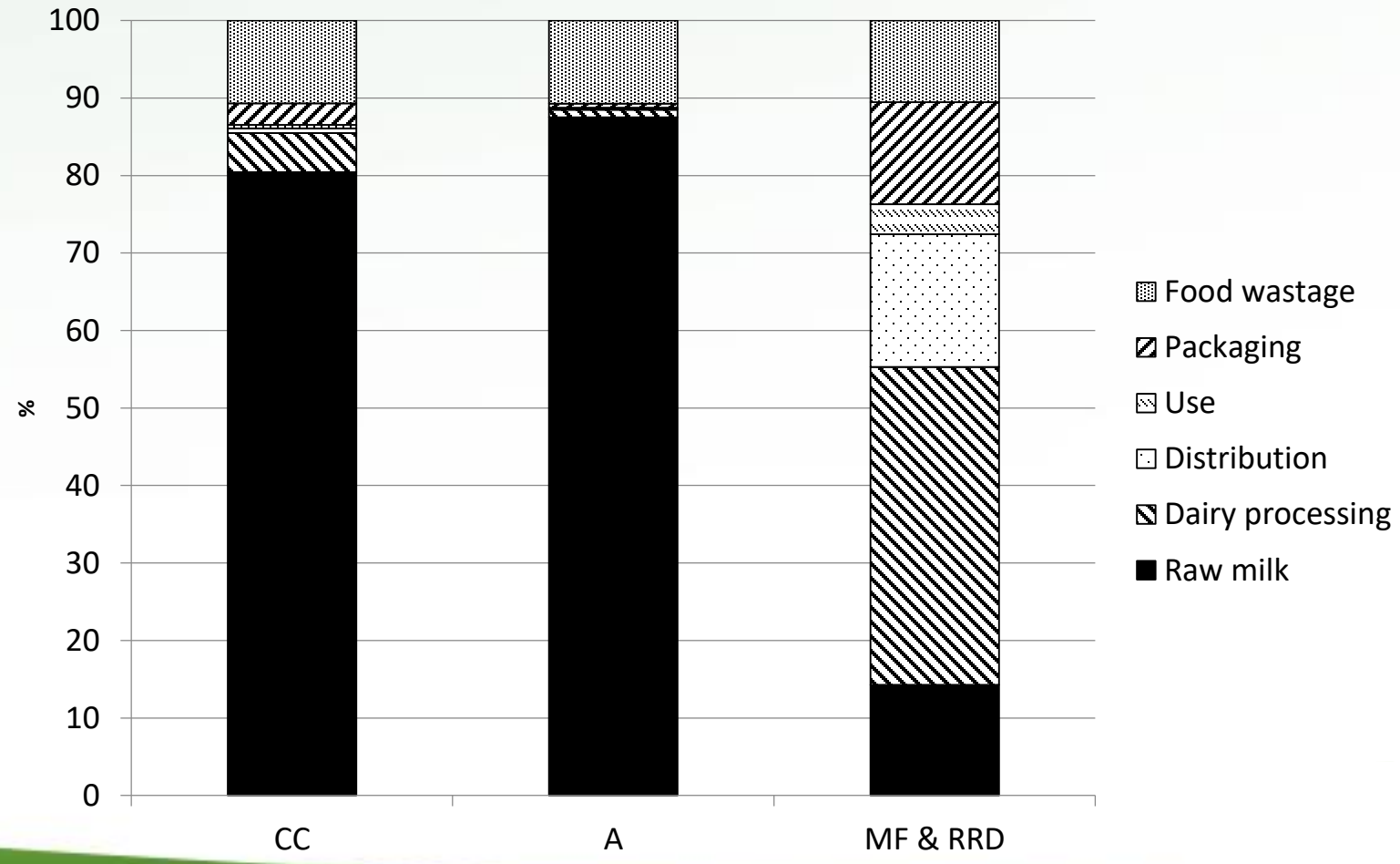
Raw milk production phase			
Raw milk	5.56 kg	Transport raw milk	0.19 tkm
Dairy processing and ripening phase			
Salt	Water	Electricity	Heat
0.05 kg	12.20 kg	0.97 MJ	2.7 MJ
Refrigerant gases	Cleaning agents	Wastewater	Transport in input
0.01 g	0.01 kg	8.04 kg	0.028 tkm
Packaging phase			
Polymer bag	Corrugate board	LDPE film	Flat pallet
37.00 g	51.00 g	3.00 g	5.00 g
Food loss	**5%**	**Food waste**	**7%**

Potenital environmental impacts

Functional unit 10g of dry matter (not 1 kg of cheese):

3 different impact categories out of 16:

- Climate Change (CC)
- Acidification (A)
- Mineral Fossil & Ren Resource Depletion (MF&RRD)



Improvement actions

Heat recovery in dairy: 10% reduction in heat consumption, 5% reduction in electricity consumption

Packaging optimization: reduction between 30% and 40% of the materials used

Potenital impacts	Characterization				Weighted			
	Units	Pre-value	Post-value	Delta	Units	Pre-value	Post-value	Delta
CC	$kgCO_2eq.$	1.55E-1	1.52E-1	1.6%	µPt	1.12E+0	1.10E+0	1,6%
A	molc H+-eq.	3.64E-3	3.63E-3	0,3%	µPt	5.56E+0	5.55E+0	0,3%
MF&RRD	kgSb-eq.	3.56E-7	3.28E-7	7,8%	µPt	2.35E-1	2.17E-1	7,8%
				TOTAL	µPt	6.90E+0	6.86E+0	0,8%

Conclusions

Raw milk production represents the main contribution

Mitigation solutions proposed had a low benefit

NEXT STEPS

Designing solutions (packaging, logistics) to reduce food waste (10% of total impact). Implementing actions to improve the production of raw milk (80% of total impact).

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Thank you