

Work Package 5.1. Economic and Multi-criteria Impact Assessment

"Evaluating Resource Use in Low Input Systems"

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Presentation Overview

- From defined production schemes to reference quality assurance schemes
- Multi-criteria assessment of reference schemes and incidence on breeding innovations: public goods and resource use











1. Production Schemes identified in LIB project document

- Dairy Cows (p. 39)
- Certified organic dairy production systems which follow EU-organic farming standards
- Non-organic 'low input' systems are either
 - (a) traditional grazing based systems (often located in mountainous areas of Europe)
 - (b) novel New Zealand-type low input/low cost systems (developed in some European regions due to decreasing milk prices and increasing input costs)
 - Sheep (p. 79)
- · Organically certified
- Traditional (:extensively outdoor reared)











• Pigs (p. 110-111)

- Non-organic 'low input' systems usually characterised:
 - by smaller herd size, more space per animal, lower capital investment, often outdoor management, provision of bedding, greater labor requirement and focus on animal welfare.
- Organic production systems have similar characteristics but with additional prescriptions as to stocking densities and access to outdoor runs, levels of 'bought in, non-organic' feeds and use of GM-feeds.
 - Laying Hens (p. 141)
- Organically certified:
 - (a) maximum / minimum outdoor husbandry,
 - (b) using molting systems
- Non-organic free-range











2. Representative Sub-set Reference Schemes

• Task 1 Working Package:

• "Identification of a representative set of quality assurance reference schemes for the evaluation of livestock production systems under the LIB project"

• Criteria for workable set of production systems?

- Broad coverage of issues regarding animal welfare, pesticide use, climate change (forage), human health (antibiotics)
- Identification of the systems we do want to evaluate and improve upon within the LIB project?

•How?

- Drawing from the definitions of production schemes in LIB project
- Stakeholder consultation: Workshop in Brussels, 26.05.11



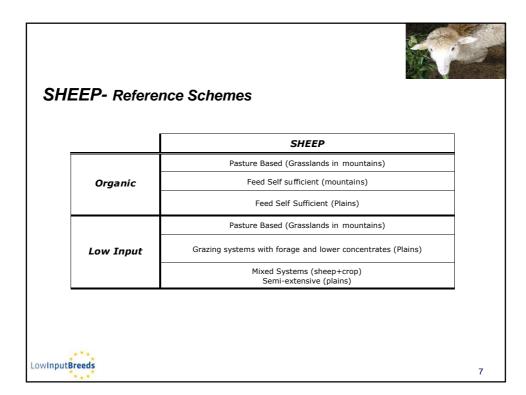


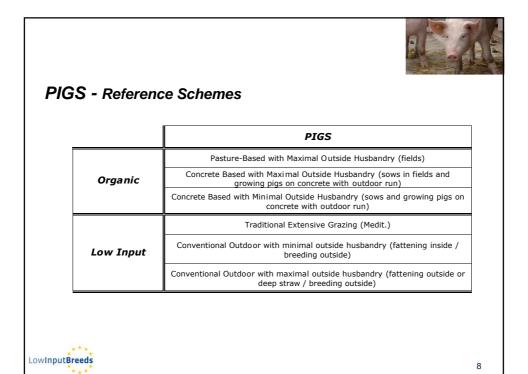
DAIRY COWS - Reference Schemes

	DAIRY COWS	
Organic	Pasture Based (Grasslands)	
Organic	Mixed Systems (Sillage and Pasture)	
Low Input	Traditional Grazing Systems (Mountains)	
	Low Cost Mixed Production (Grasslands: NZ)	



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LAYING HENS - Reference Schemes

	LAYING HENS
	Maximal Outside Husbandry (Large flocks, ± 15.000)
Organic	Minimal Outside Husbandry (Small flocks, ± 3.000)
	With Extended Laying Period (up to 100 d. against throw outs)
	Free Range with Maximal Outside Husbandry
Low Input	Free Range with Minimal Outside Husbandry
	Free Range With Extended Laying Period



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3. Multi- Criteria Assessment Template

Why an assessment?

- Cost-benefit analysis of LI and Organic production
 - Price premium for various labelling and consumer information systems (e.g. organic label for animals, organic plus labels for others)
 - Subsidies for certain social welfare outputs of the production systems (e.g. for landscape preservation)
 - Model to calculate the profit margins under the various production systems and price premium scenarios
- Assessment profit margins generated by improved breeds of LIB project











Why an assessment?

- · Cost-benefit analysis of LI and Organic production
- Assessment of profit margins generated by improved breeds resulting LIB project
 - Identify cases of improved organic or low input breeds for which there is evidence of both economic and societal benefits
 - Define measures to support rapid introduction of innovation in commercial practice



Assessment Template







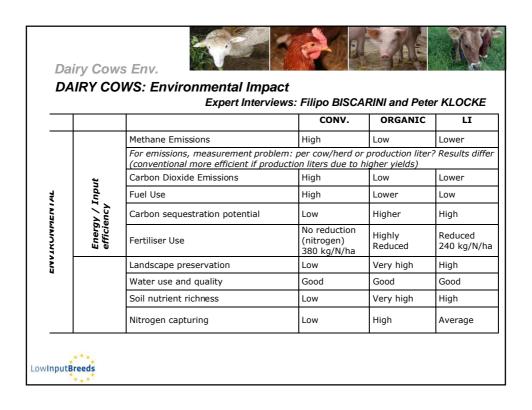


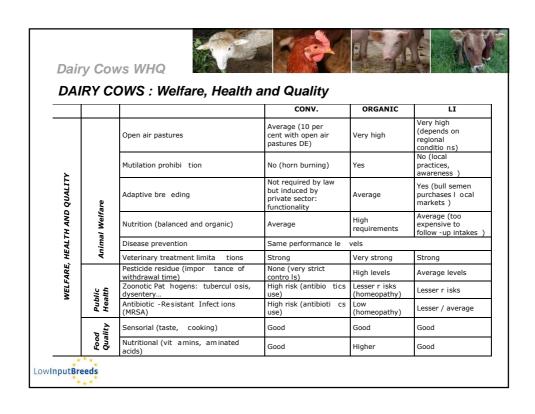
Multi-Criteria Assessment Table

- Criteria drawn from literature and legislation review
- Consolidated through stakeholder consultation February March 2010

		Methane Emissions	
		Carbon Dioxide Emissions	
	Energy Efficiency / input efficiency	Fuel Use	
		Carbon sequestration potential	
ENVIRONMENTAL		Fertiliser Use	
		Landscape preservation	
	Biodiversity and Landscape	Water use and quality	
	Conservation	Soil nutrient richness	
		Nitrogen capturing	
		Open air pastures	
WELFARE, HEALTH AND QUALITY		Mutilation prohibition	
	Animal Welfare	Adaptive breeding	
	Animai Weirare	Nutrition (balanced and organic)	
		Disease prevention	
		Veterinary treatment limitations	
		Pesticide residue	
	Public Health Food Quality	Zoonotic Pathogens	
		Antibiotic-Resistant Infections (MRSA)	
		Sensorial (taste, cooking)	
		Nutritional (vitamine aminated acide)	







Sheep Env.









SHEEP: Environmental Impact

Experts: Marc BENOIT, Hervé HOSTE and Smagda SOTIRAKI

		CONV.	ORGANIC	LI	
	Methane Emissions	Correlation between ewe productivity and emissions if calculate per carcass ; different if calculated per product kg/liter (in parallel to dairy cows)			
ų	Carbon Dioxide Emissions	-	Leguminous valorisation		
Input	Fuel Use	Neg.	Very good, esp. if recourse to open air	pastures	
Energy /]	Carbon sequestration potential	High levels of surface use and density	Chemical fertilizer absent	Sequestration surface larger	
Ene	Fertiliser Use	Neg.	Excellent	Good	
	Landscape preservation	Less space but pastoralism	Extra efforts; excellent results	Less efficient than organic but still positive	
``	Water use and quality	Few irrigation efforts	No pesticide	Few pesticide	
Biodiversity	Soil nutrient richness	Important losses	Less material losses but difficulties linked with exogen fertiliser		
Biod	Nitrogen capturing	Average (chemical fertilization)	Excellent, no spare wheel to search N	Real potential, few fertilizer per N	

Low**InputBreeds**

Supp. Criteria: forage self-sufficiency and utilization of nitrogen (vis-à-vis fuel use); non-renewable energy consumption, pesticide use, resource allocation (milk, meat or wool) Need to take into account secondary effects related to indirect surfaces for concentrates' import (even more detrimental hidden effects)

Sheep WHQ









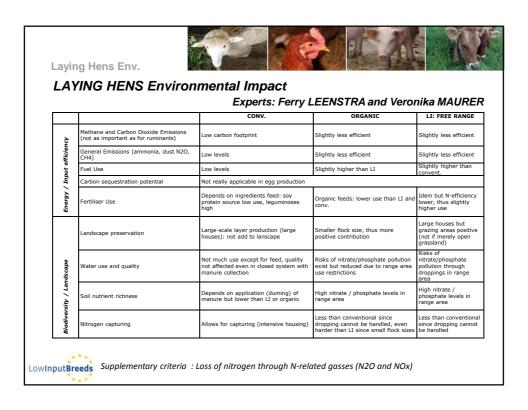
SHEEP: Welfare, Health and Quality

		CONV.	ORGANIC	LI
	Open air pastures	Not mandatory but 95% include	Mandatory even for young (cause problems)	Automatic inclusion
	Mutilation prohibition	Castration etc regional labels	Gen. prohibition exc. traditional	As conventional
Welfare	Adaptive breeding (very positive impact on results)	Industry pressure no rustic breeds	Mandatory in cahier charges	Needed since have to be robust (alone)
Wel	Nutrition (balanced and organic)	Recommendation zootech. Class but average	Cahier des charges	As conventional
4 nimal	Disease prevention	Punctual intervention	Cahier des charge (but problems with parasites)	As conventional
Ani	Veterinary treatment limitations	No interdiction except specific labels	Limited antibiotics	As conventional
	Pesticide residue (importance of withdrawal time)			
it ii	Zoonotic Pathogens: tuberculosis, dysentery			
Public Health	Antibiotic-Resistant Infections (MRSA)			
d lity	Sensorial (taste, cooking)	Better results than organic		
Food Quality	Nutritional (vitamins, aminated acids)		Better results	



Supp. Criteria: Additives use (more controlled in organic)

		Ifare, Health and Quality	CONV.	ORGANIC	LĪ
		Open air pastures			
	ō	Mutilation prohibition			
	lfar	Adaptive breeding			
<u>}</u>	Ň	Nutrition (balanced and organic)			
4LI	Animal Welfare	Disease prevention			
On		Veterinary treatment limitations			
HEALTH AND QUALITY		Pesticide residue (importance of withdrawal time)		Outdoor rearing salmonella risks	
Ħ	lic Ith	Zoonotic Pathogens (Enteric)			
HEAL	Public Health	Antibiotic-Resistant Infections (MRSA)			
		Sensorial (taste, cooking)	-	Grain and nutrient feeds improves intra-muscula content	
		Nutritional (vitamins, aminated acids)			



Laying Hens WHQ LAYING HENS: Welfare, Health and Quality None (but no real problems), except de-beaking in future Mutilations not allowed, feather pecking problems (70 % flocks affected) Mutilation prohibition Not in particular Not in particular daptive breeding Nutrition (balanced and organic) Idem, more parasites but better other parameters Yes for NCD and Salmonella (vaccination) Few treatments due to egg withdrawal time (except for extensive vaccination during rearing) Inimal dem, but no preventive medication during rearing) eterinary treatment limitations Pesticide residue (importance of withdrawal time) Idem but higher risk of dioxine contamination since outdoor area use No particular risk, regular checks None except for synthetic amino acids, vitamins, minerals and additions for yolk color Shell quality Efforts to increase specific fatty acids vit E and selenium concentration (through diet) Food Qualit lutritional (vitamins, aminated acids Supplementary criteria: Space allowance inside / space allowance outside; hidden costs of feed LowInputBreeds production overseas







Concluding Remarks:

Preliminary results and most-representative variables choice

Thank you for you attention

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