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Work package 5.1 aims at the evaluation of existing accreditation mechanisms and economic approaches related to low-input livestock farming systems and thus of sustainable development processes through a multi-criteria evaluation of the public goods delivered by different production systems, management techniques and breeding innovations. To this end, we are conducting a comparative analysis of approaches to low-input livestock production, based on the multi-criteria assessment of the performances of production schemes in the delivery of public goods.

This analysis operates on the 'best representative' production schemes for which breeding innovations are developed within the scope of the 'Low Input Breeds' Project; production schemes that have been initially drawn from the working paper of the project, modified and consolidated in accordance with literature and e-mail consultation of LIB experts. Identified relevant and most-different systems have been presented, showing the transition from defined production schemes to reference quality assurance schemes. Indeed, at least four reference quality schemes have been identified for each animal, both for organic and low-input production.

TABLE 1: Summary of Identified reference quality assurance schemes

		Feed / Geography		Animal Welfare / Housing (Outdoor)	
		DAIRY COWS	SHEEP	PIGS	LAYING HENS
Organic	Pasture Based (Grasslands)	Pasture Based (Grasslands in mountains)	Pasture-Based with Maximal Outside Husbandry (fields)	Maximal Outside Husbandry (Large flocks, ± 15.000)	
	Mixed Systems (Sillage and Pasture)	Feed Self sufficient (mountains)	Concrete Based with Maximal Outside Husbandry (sows in fields/pigs concrete)	Minimal Outside Husbandry (Small flocks, ± 3.000)	
		Feed Self Sufficient (Plains)	Concrete Based with Minimal Outside Husbandry (all concrete - outdoor run)	With Extended Laying Period (up to 100 d. against throw outs)	
Low Input	Traditional Grazing Systems (Mountains)	Pasture Based (Grasslands in mountains)	Traditional Extensive Grazing (Medit.)	Free Range with Maximal Outside Husbandry	
	Low Cost Mixed Production (Grasslands: NZ)	Grazing systems with forage and lower concentrates (Plains)	Conventional Outdoor with minimal outside husbandry (fattening inside / breeding outside)	Free Range with Minimal Outside Husbandry	
		Mixed Systems (sheep+crop) Semi-extensive (plains)	Conventional Outdoor with maximal outside husbandry (fattening outside or deep straw / breeding outside)	Free Range With Extended Laying Period	

The next step of our analysis entailed the determination of relevant criteria that needed to be taken into account within the multi-criteria assessment of the defined reference quality schemes. To that end, the initial template established through literature review has been consolidated and amended through a multi-stakeholder expert workshop with participants of all the other Low Input working packages, convened on the 26th May 2010 in Brussels. The environmental assessment thereby pertained to the analysis of energy or input efficiency, but also to the potential for biodiversity and landscape conservation; while welfare, animal health, food safety and quality criteria were also taken into account. Bearing in mind the rationale of such assessment, the table was filled for each animal production under study, highlighting different criteria to be evaluated in the further course of this research project.

TABLE 2: Example of completed intermediate term multi-criteria assessment for dairy cows

			CONV.	ORGANIC	LI
ENVIRONMENTAL	Energy / Input efficiency	Methane Emissions	High	Low	Lower
		<i>For emissions, measurement problem: per cow/herd or production liter? Results differ (conventional more efficient if production liters due to higher yields)</i>			
		Carbon Dioxide Emissions	High	Low	Lower
		Fuel Use	High	Lower	Low
		Carbon sequestration potential	Low	Higher	High
	Biodiversity / Landscape	Fertiliser Use	No reduction (nitrogen) 380 kg/N/ha	Highly Reduced	Reduced 240 kg/N/ha
		Landscape preservation	Low	Very high	High
		Water use and quality	Good	Good	Good
		Soil nutrient richness	Low	Very high	High
		Nitrogen capturing	Low	High	Average
WELFARE, HEALTH AND QUALITY	Animal Welfare	Open air pastures	Average (10 per cent with open air pastures DE)	Very high	Very high (regional conditions)
		Mutilation prohibition	No (horn burning)	Yes	No (local practices, awareness)
		Adaptive breeding	Not required but induced by private sector: functional	Average	Yes (bull semen purchases local markets)
		Nutrition (balanced and organic)	Average	High requirements	Average (too expensive to follow)
		Disease prevention	Same performance levels		
		Veterinary treatment limitations	Strong	Very strong	Strong
	Public Health	Pesticide residue (importance of withdrawal time)	None (very strict controls)	High levels	Average levels
		Zoonotic Pathogens: tuberculosis, dysentery...	High risk (antibiotics use)	Lesser risks (homeopathy)	Lesser risks
		Antibiotic-Resistant Infections (MRSA)	High risk (antibiotics use)	Low (homeopathy)	Lesser / average
	Food Quality	Sensorial (taste, cooking)	Good	Good	Good
		Nutritional (vitamins, aminated acids)	Good	Higher	Good

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