

Environmental impacts, roles and services from livestock farming: current situation and avenues for improvement

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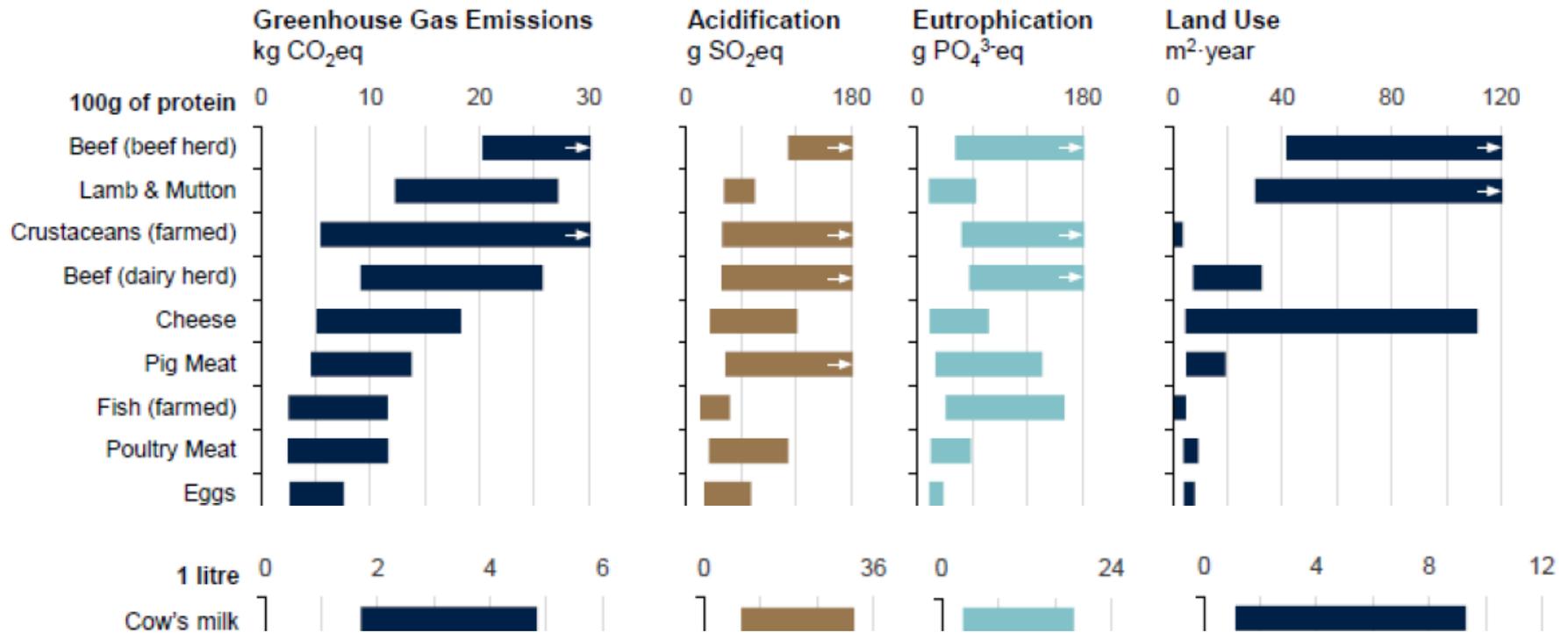
Animal Task Force Seminar
7.11.2018, Brussels

Agenda

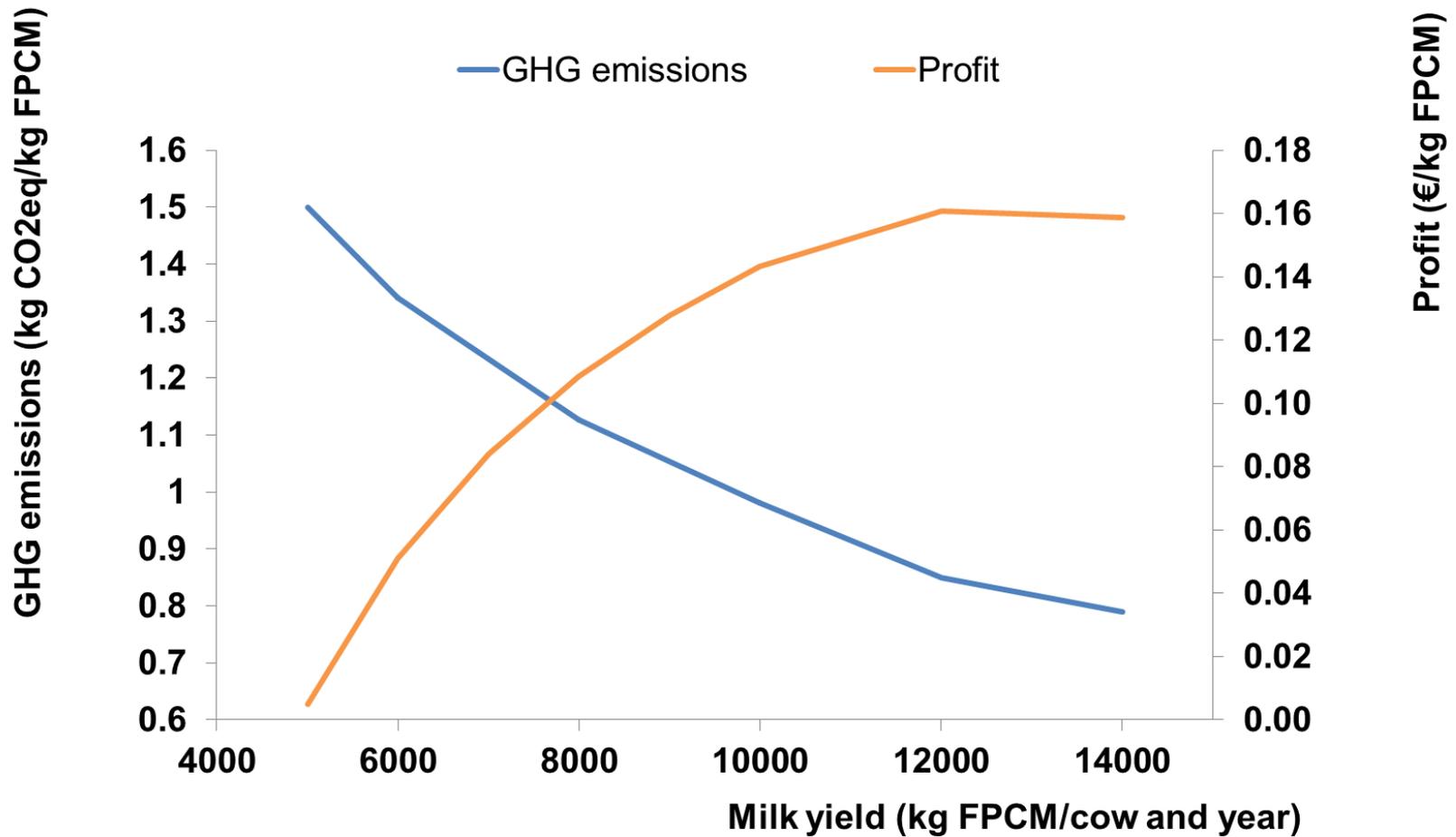
- Current situation: scientific view

- Things to consider forming avenues for improvement
 - Multi-dimensional and multi-level approach

Imbalance towards a few side-effects of livestock products among environmental scientists



Model outputs – GHG emissions and profit



Summary I

- Narrow focus either on economics or environment often came to a similar conclusion i.e. increase animal productivity
- Both did often not look at side-effects (either positive or negative ones)
- Summary: focus on cost reduction and input management missed to address the side-effects AND their intercorrelations

Livestock systems provide a portfolio of benefits & costs

Social and cultural

Employment in livestock farms
Employment in animal industry
Job quality in livestock sector
Animal health and welfare
Nutritious diversified products

Landscape heritage

Acidifying & GHG emissions

Water and soil quality

Low consumer prices
Resilience

Farm income

Value added

Meat production

Egg and milk production

Carbon sequestration

Biodiversity conservation

Maintenance of soil fertility

Economic

Environment

Ecosystem services and multi-functionality are being recognized

Socio-cultural and economic value of ecosystem services provided by Mediterranean mountain agroecosystems

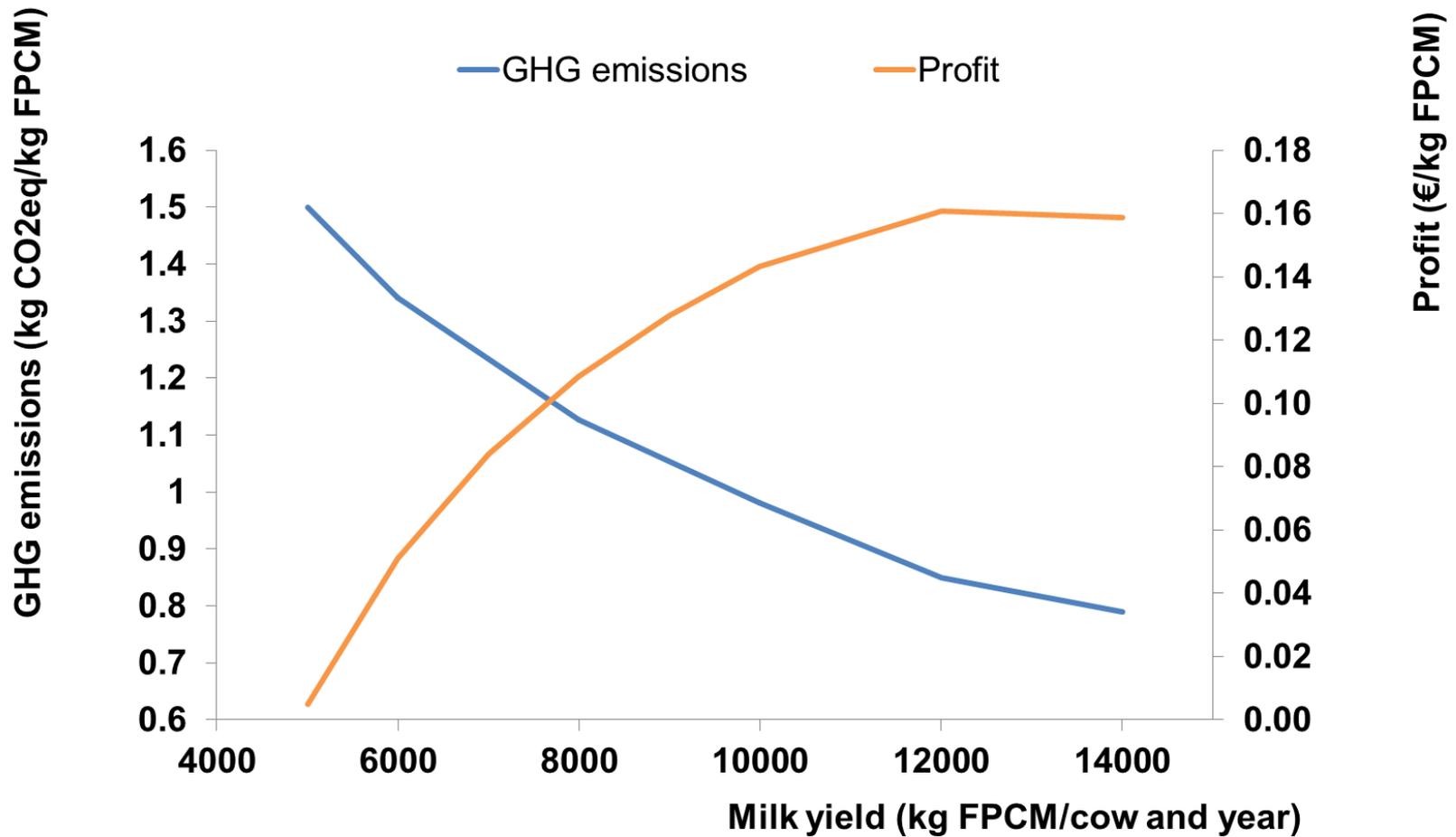
	Policy A	Policy B	CURRENT policy
Landscape	 strong increment of bushes reduction of meadows and crops	 light decrement of bushes light increment of meadows and crops	 light increment of bushes meadows and crops are maintained
Bearded vulture	 7 pairs	 15 pairs	 11 pairs
Forest fires	 6 forest fires per year	 2 forest fires per year	 4 forest fires per year
Product quality linked to territory	 2 quality products available sheep cheese and lamb meat	 6 quality products available sheep cheese, lamb meat, pasture pork meat, olive oil, pasture beef and organic lamb	 4 quality products available sheep cheese, lamb meat, pasture pork meat and olive oil
Annual cost	 15 €	 75 €	 45 €
CHOICE	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C

Trade-offs and synergies at farm level

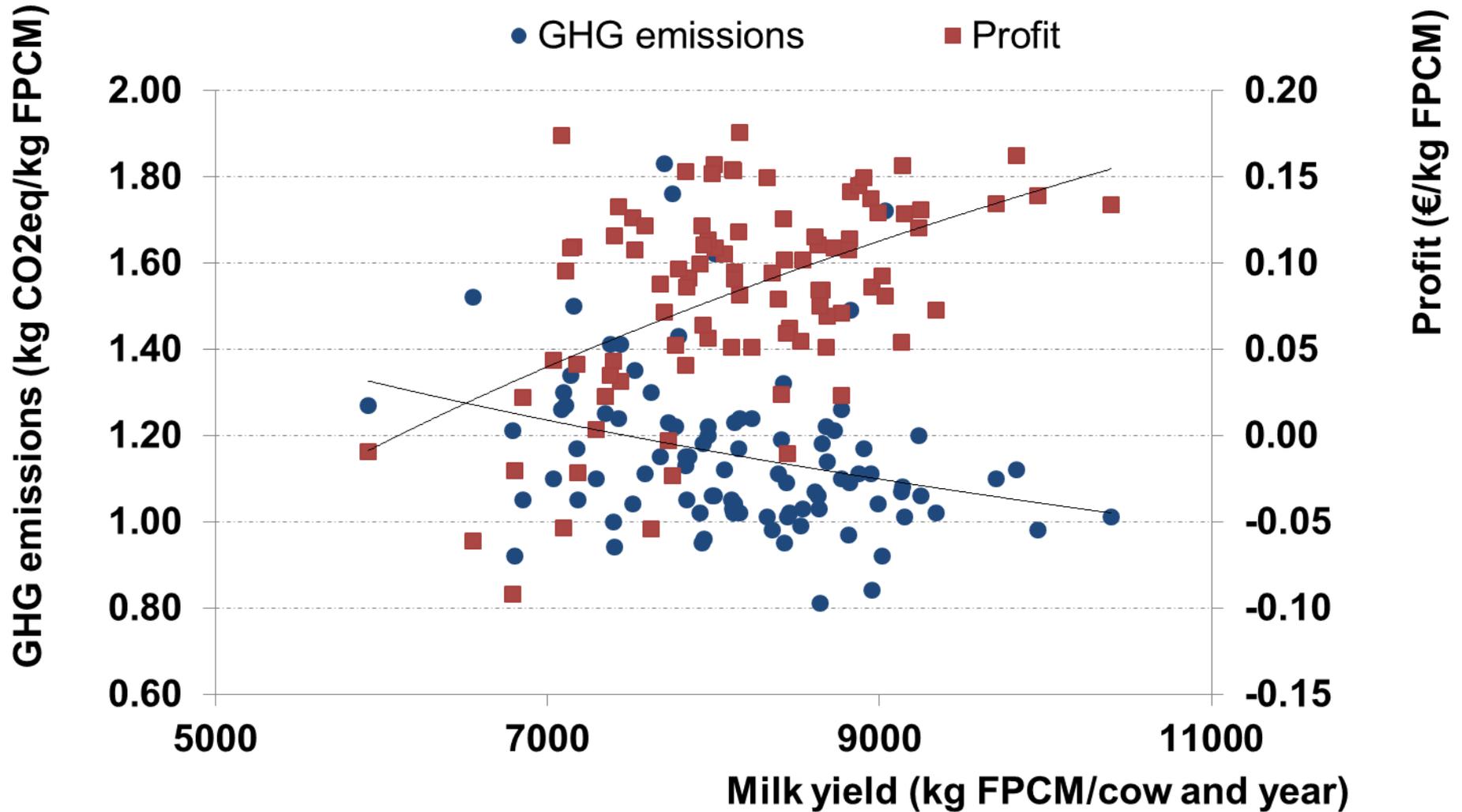
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Comparison of Dairy cow production systems

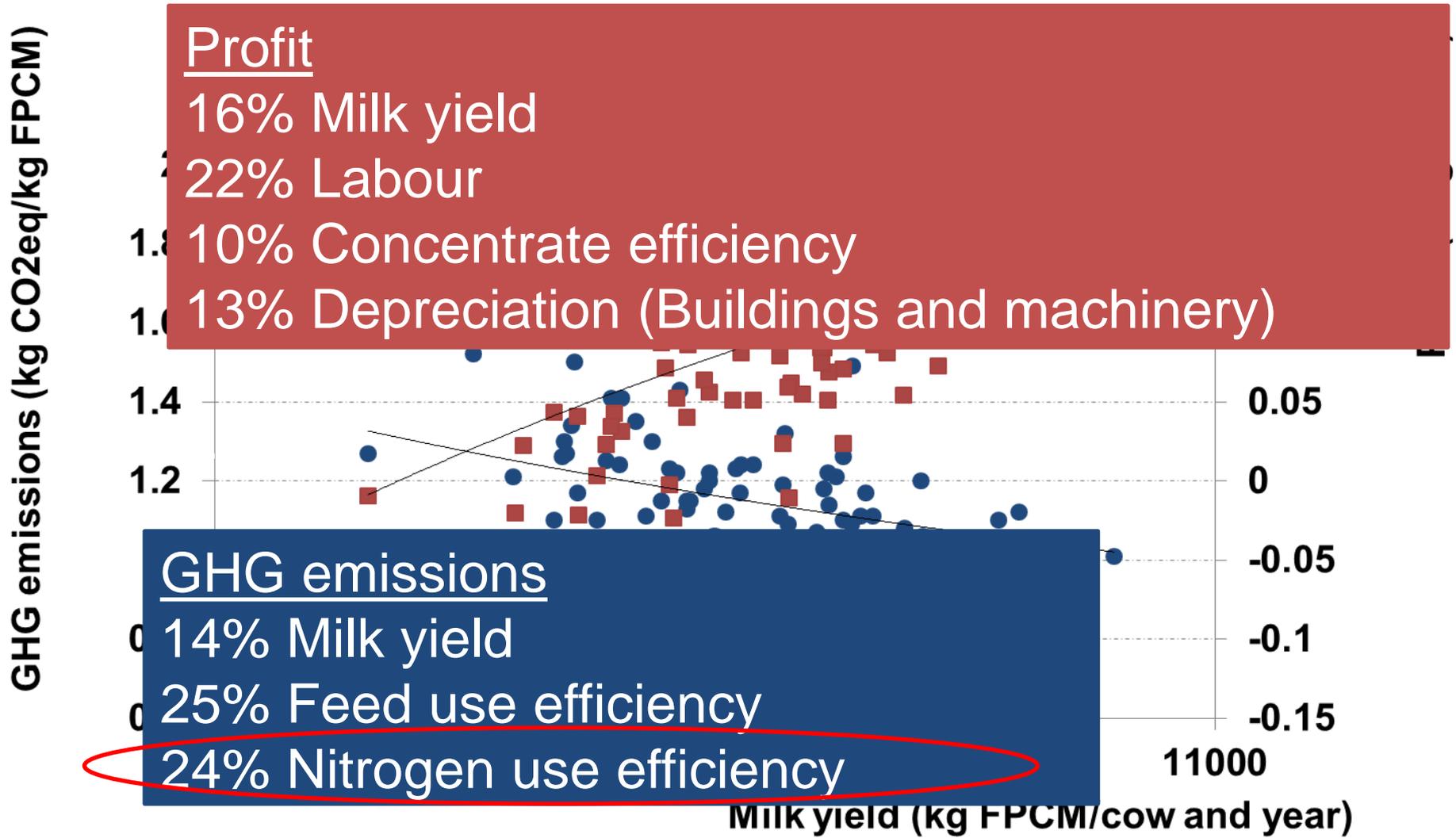
Model outputs – GHG emissions and profit



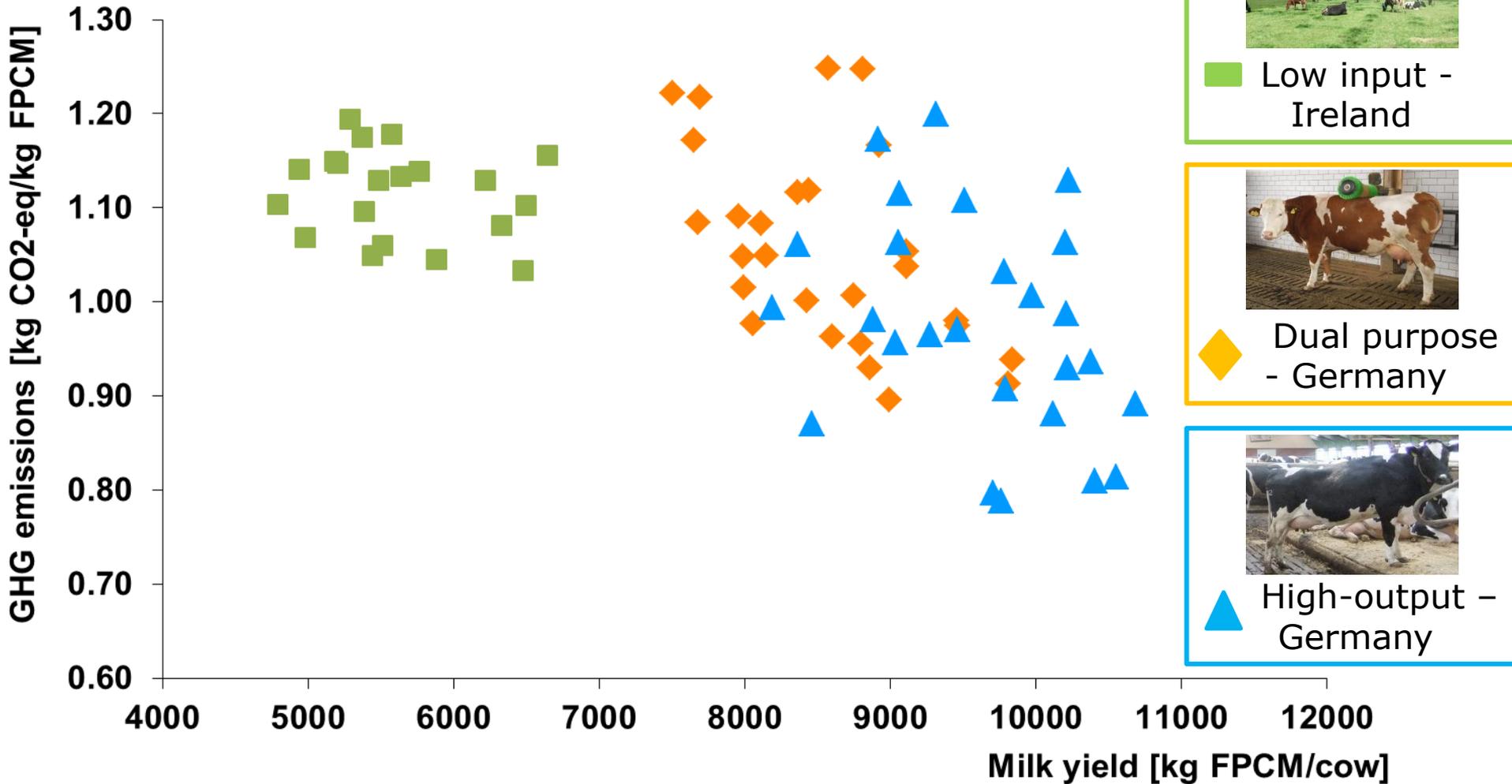
Decomposition of variation within systems - data from 100 dairy farms



Decomposition of variation within systems - data from 100 dairy farms



GHG emissions and milk yield – high variation within systems



Low input - Ireland

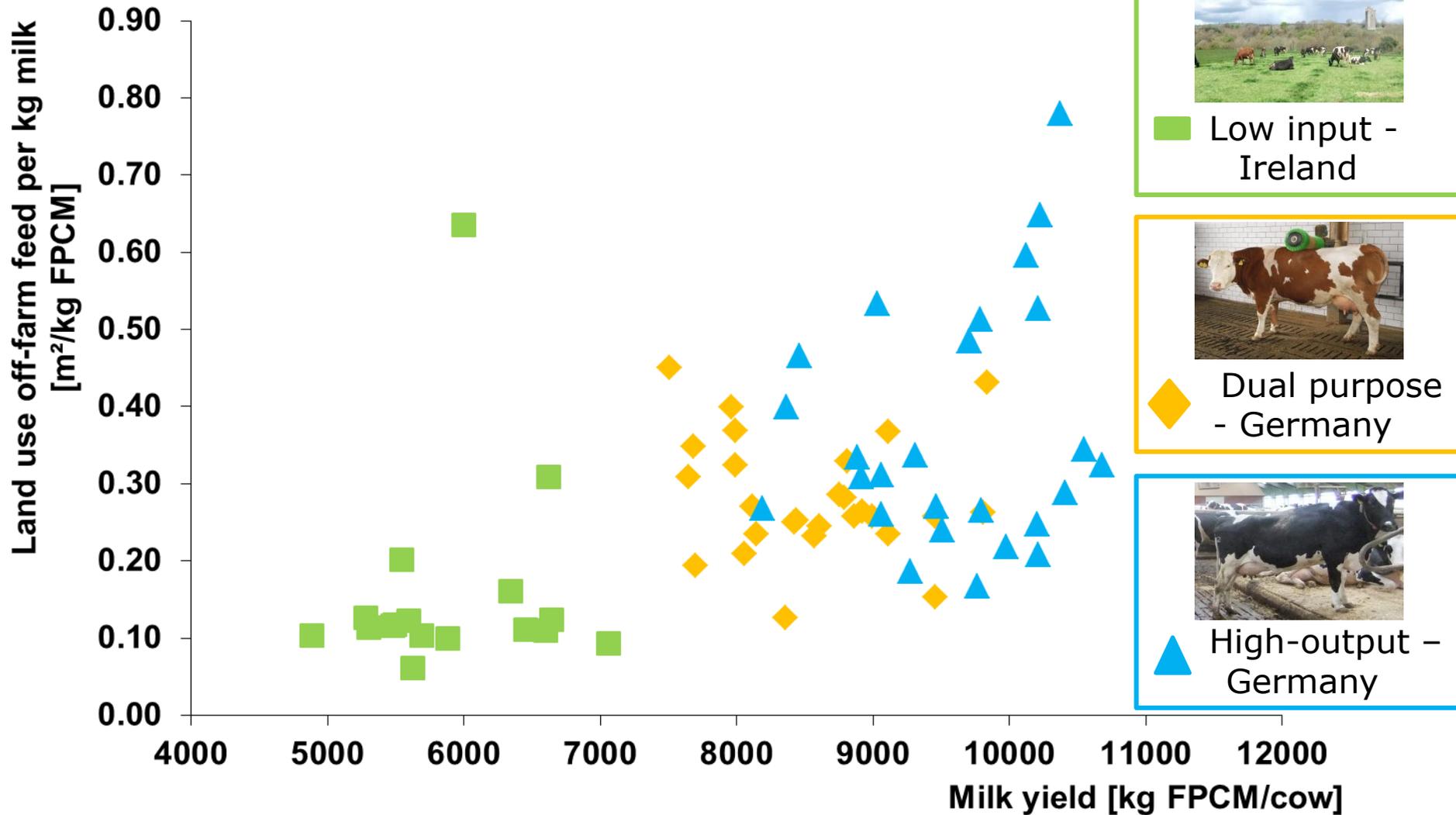


Dual purpose - Germany



High-output - Germany

Side-effect: land use from off-farm feed production



Low input - Ireland

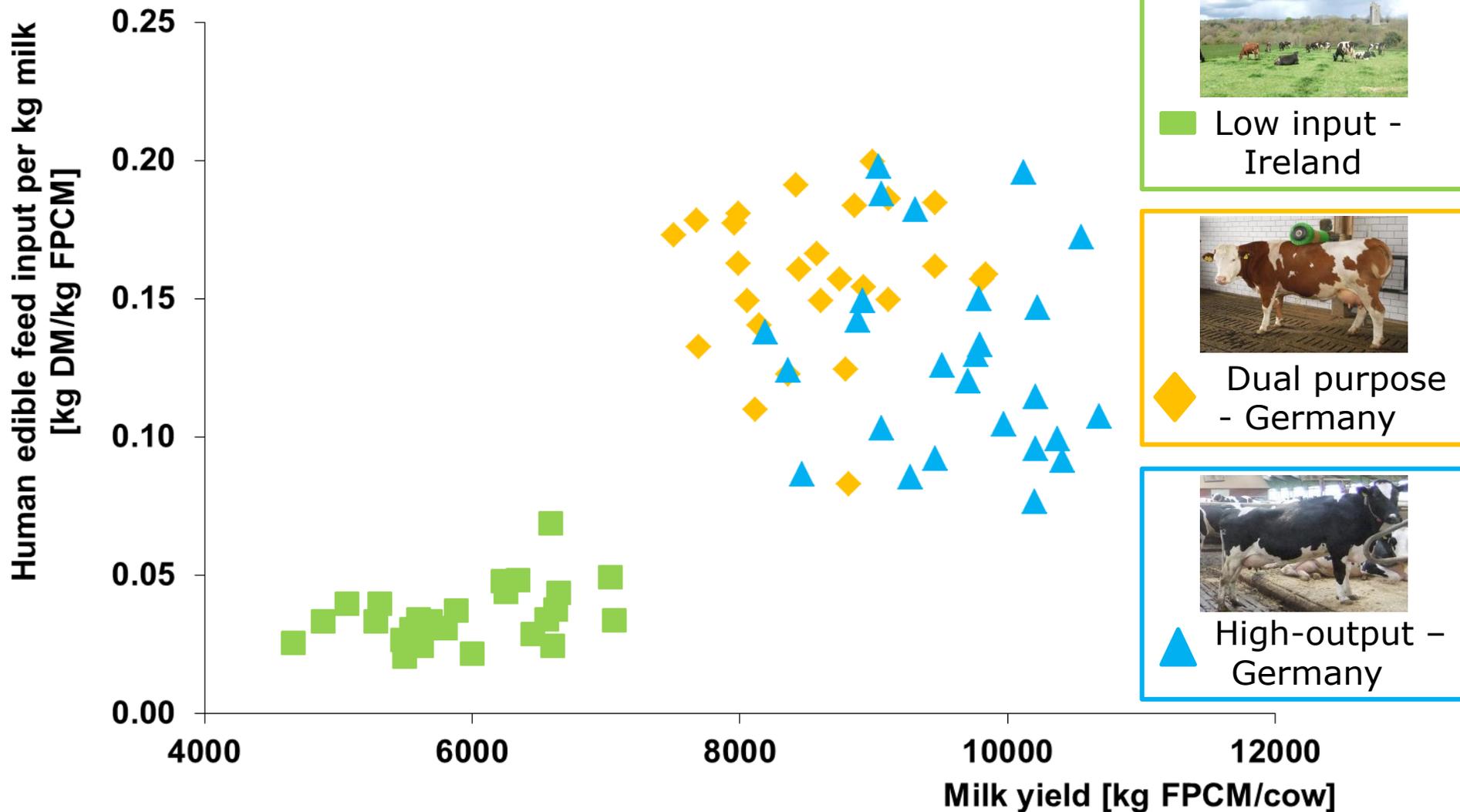


Dual purpose - Germany



High-output - Germany

Side-effect: human edible feed input and milk yield



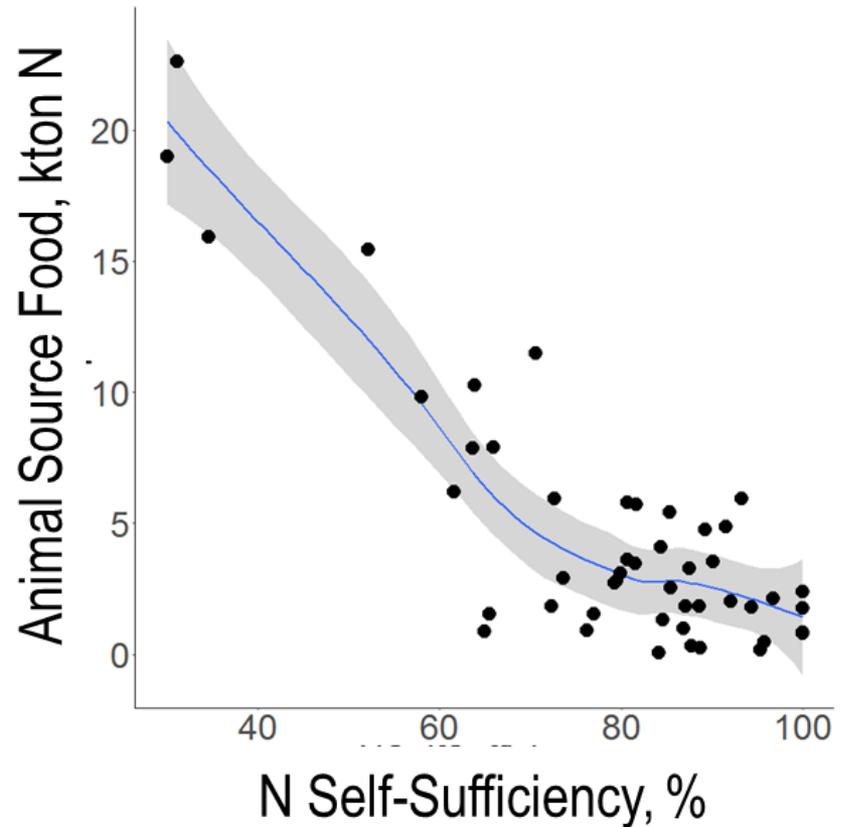
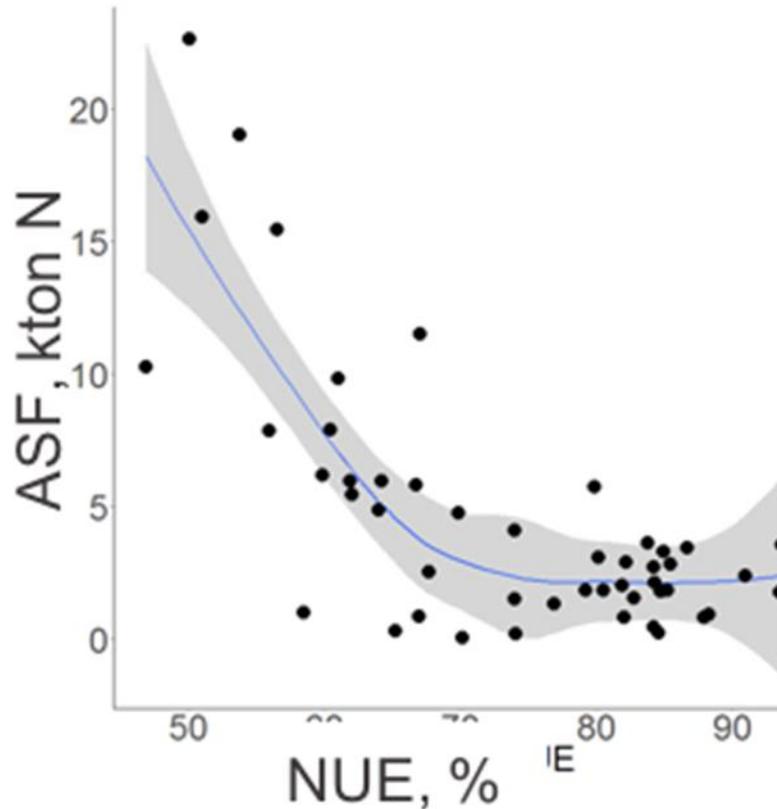
Summary II

- Different livestock systems provide different portfolios of benefits and costs
 - no silver bullet at the farm level
- High variation of cost and benefit indicators within different farming systems
 - Need to look for improvement within systems
- Intercorrelations need to be taken into account e.g. milk and beef output

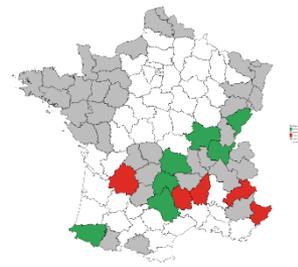
Trade-offs and synergies at regional level

Trade-offs also occur at regional level

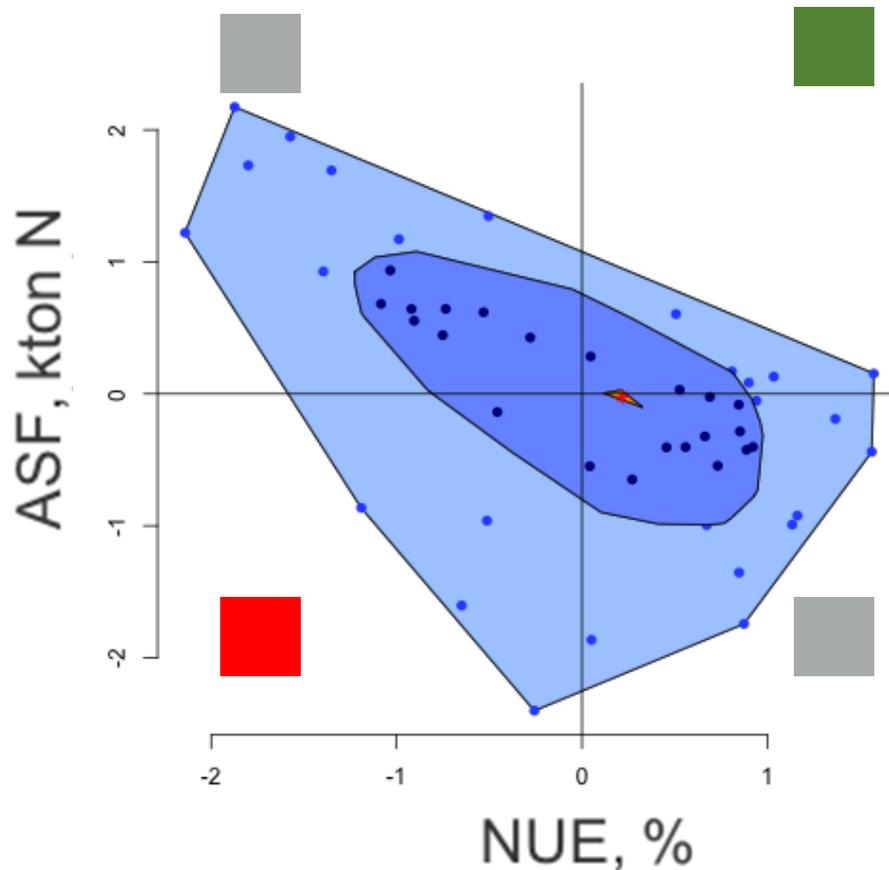
Trade-off curve based on 48 French regions (NUTS3 units)



Regional trade-offs mask spatial variation



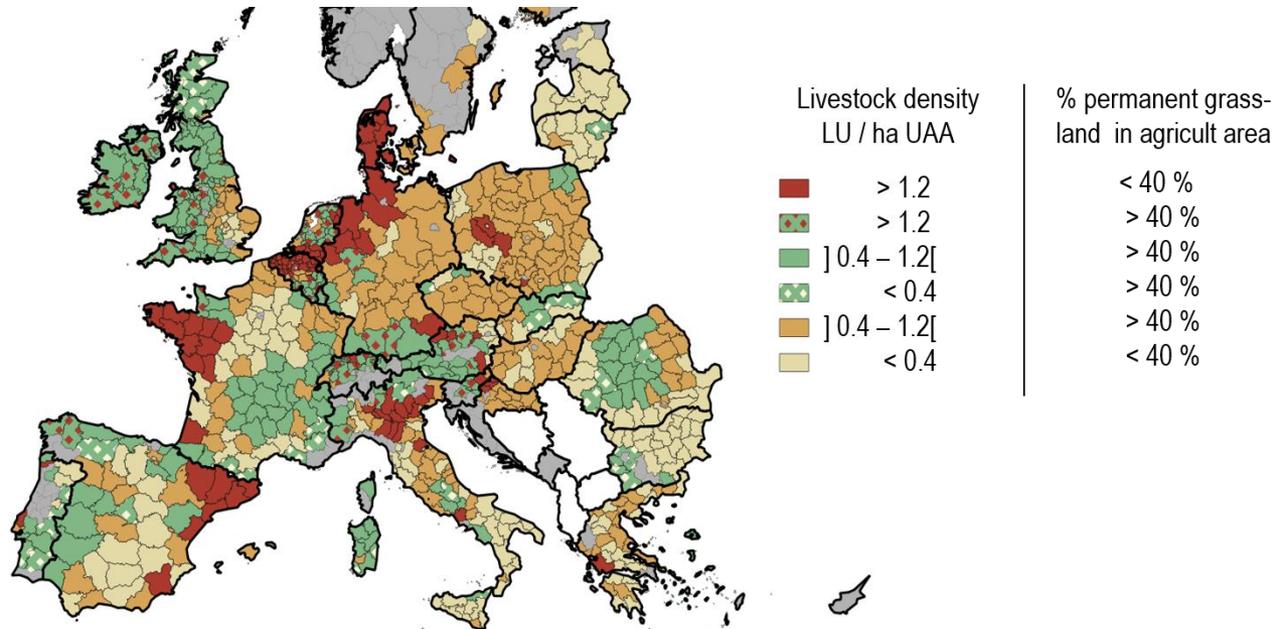
Trade-off decomposition



- Performing better than average on both indicators
- Performing lower than average on both indicators
- Performing better on one and lower on the other

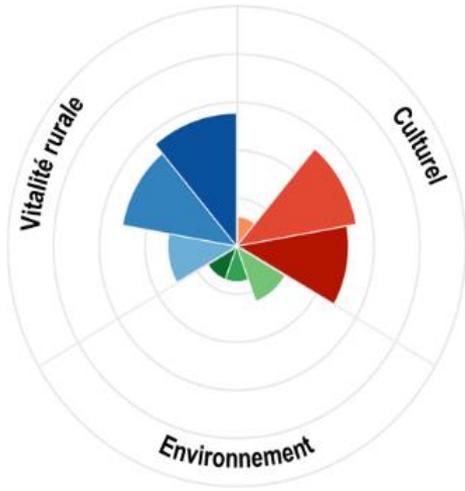
We need to account for regional livestock heterogeneities across EU

Livestock density and proportion of grassland

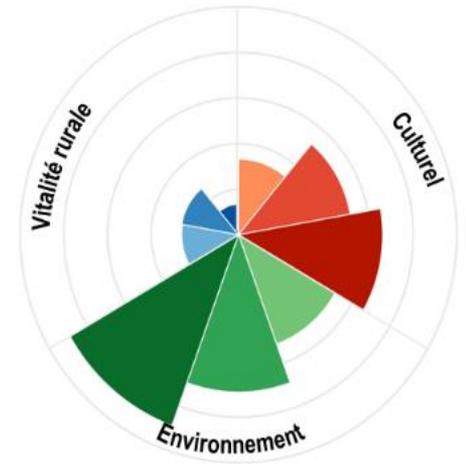
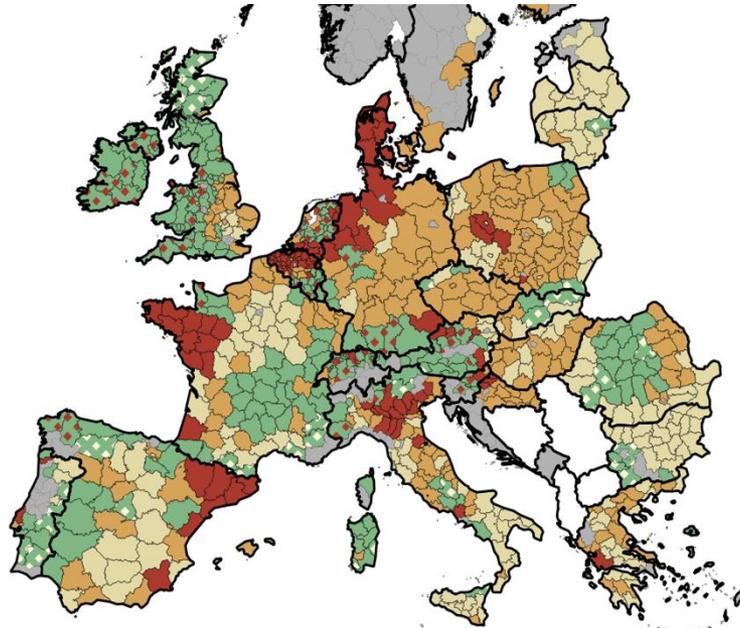


These diverse livestock systems provide very different **portfolios of benefit and costs** → they require targeted solutions (no silver bullet)

Two extreme portfolios of European livestock regions



**+
57% of
protein
production
(meat, milk,
eggs)**



**+
23% of
protein
production
(meat, milk)**

Current needs I

- Call for changes of current LFS rises a large set of innovations
- E.g. those identified in multi-actor workshops of EU-Project AnimalFuture
 - Using alternatives to GM soybean meal & domestic or on-farm protein supply
 - Use of insects for feed, byproducts, leftover streams
 - Optimized feeding in pasture based systems through the use of remote sensing and optimization algorithms
 - Payments for environmental objectives (ecosystem services) based on farm practices
 - Optimizing adaption on NEC-Guideline (considering Animal Welfare)

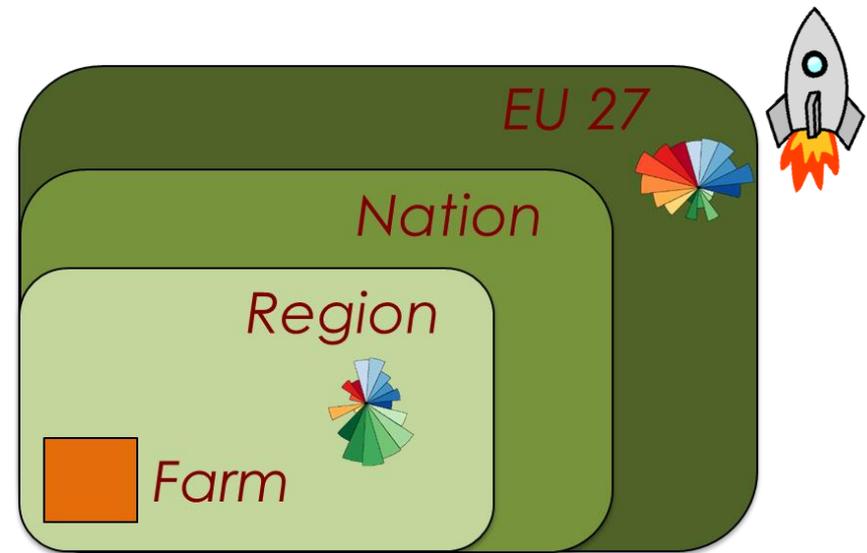
Current needs II

- Multi-dimensional and multi-level consequences of these innovations are unknown
- What works at a given level might not work at a different level
- Tool for assessing the consequences of innovations from the ground
 - multiple dimensions i.e. three pillars of sustainability: economic, environmental and social
 - multiple levels i.e. from farm to Europe
- Tool for Spotting '**where**' innovations will be more effective

Avenues for improvement - AnimalFuture concept

A multi-dimensional and multi-level framework that enables a science-based evaluation of innovations from the ground

Indicator-based DSS





STEERING ANIMAL PRODUCTION SYSTEMS TOWARDS SUSTAINABLE FUTURE

Thank
you!



ERA-NET **SUSAN**

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