

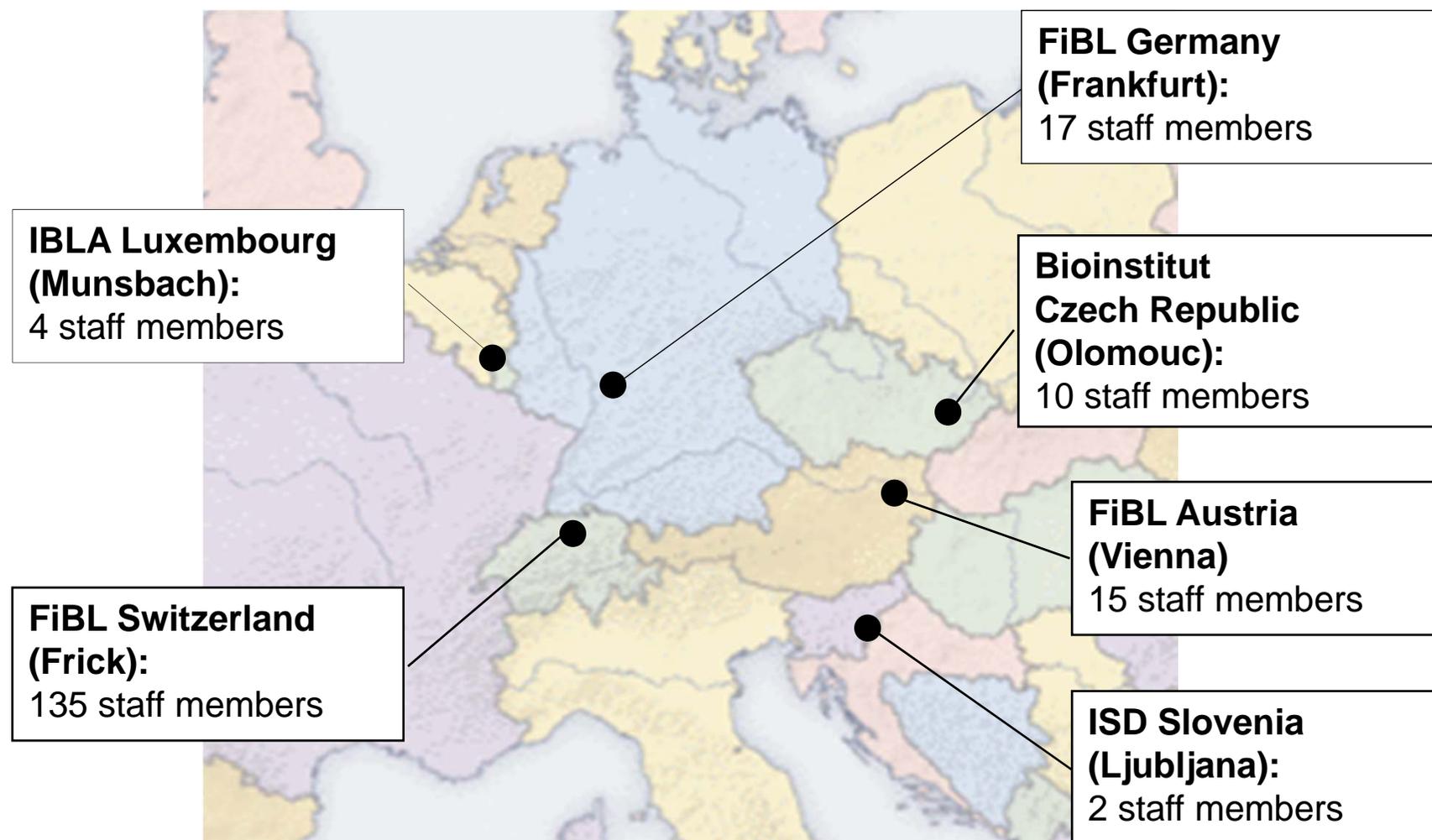


# Biodiversity impact assessment of Austrian organic and conventional dairy products

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# FiBL International: A group of six institutes



# Context of the project

- › **Austrian organic product line ‚Zurück zum Ursprung‘ (=ZZU) aimed at analysing biodiversity impacts of their products**
  
- › **ZZU standards:**
  - › **Based on organic standards (EU Council Regulation (EC) No 834/2007)**
  - › **Regional product supply chains**
  - › **Ban of quickly-soluble organic fertilisers**
  - › **Ban of soy bean in feeding rations**
  - › **Less than 0.1% GMO contamination**
  - › **Additional animal welfare standards**

# Aims of the project

## 1. Develop a comprehensive biodiversity assessment method suitable for:

- › Monitoring and evaluation of biodiversity potential at single farm level
- › Communicating the biodiversity potential of products to the consumer

## 2. Apply model for different products:

- › Phase 1: dairy products from 'hay-fed cows' (2010)
- › Phase 2: dairy products from 'silage-fed cows' (2010)
- › Phase 3: bread (2011)
- › Phase 4: vegetables and fruits (2011)

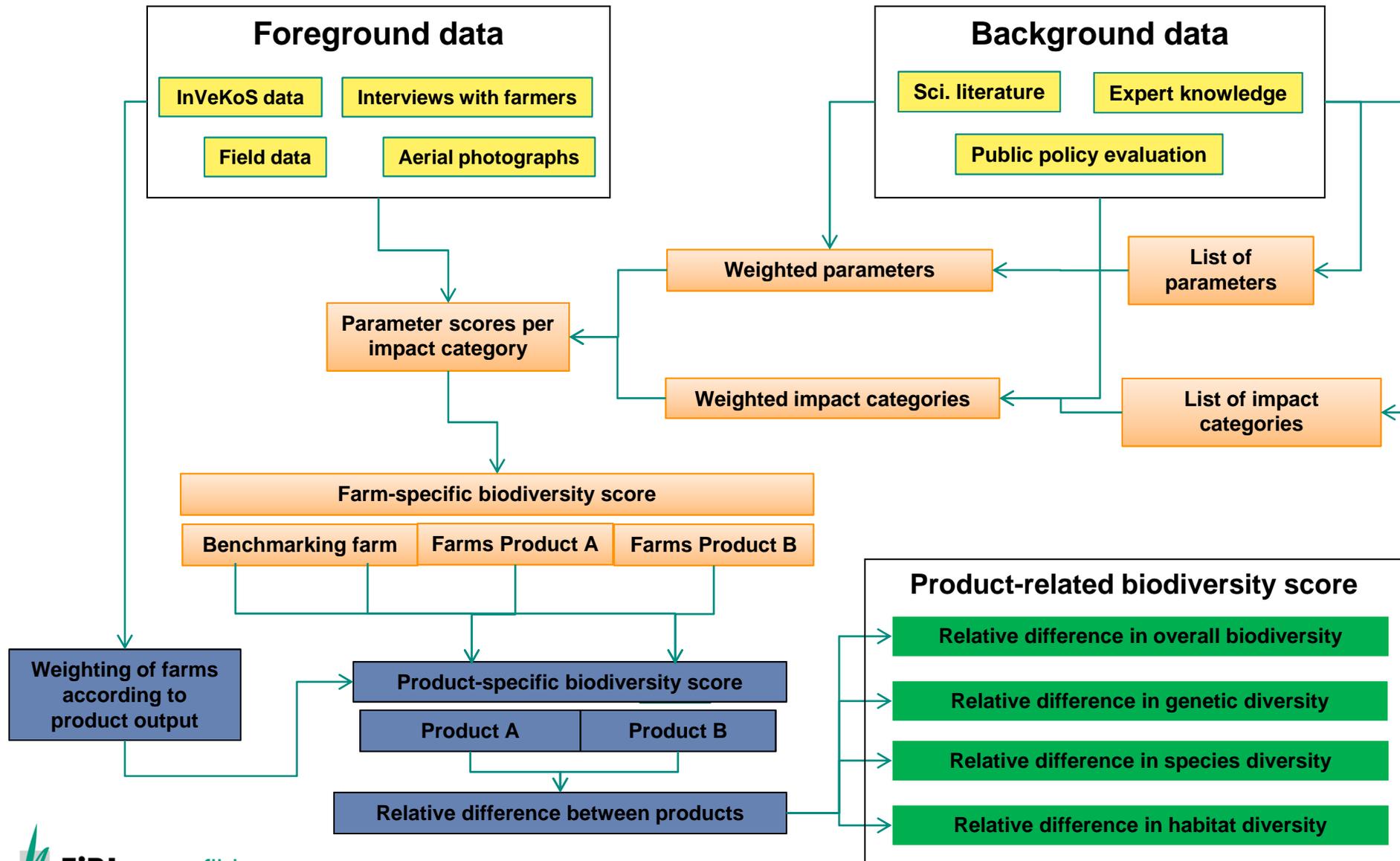
# Methodological background

- **Method development based on three existing approaches:**
  - ***Punktesystem Schweiz* (Jenny et al. 2008): Farm-level scoring system (Schweizerische Vogelwarte and FiBL)**
  - **SALCA-BD (Jeanneret et al. 2008): Farm- and field level biodiversity impact assessment method (ART)**
  - **CH-FARMIS: Economic model used in a Ph.D. thesis for analysing environmental impacts at agricultural sector level (Schader 2009)**

# Principles of the biodiversity assessment model

- **Includes genetic, species and habitat diversity**
- **Response-based approach (baseline: intensive agriculture, according to minimum environmental standards)**
- **System boundaries at farm gate**
- **Whole-farm approach, i.e. not only specific crops but the entire farm (including non-crop habitats) is taken into account**
- **Product-relation possible via farm-specific output-related aggregation factors**
- **Making use of available statistical datasets as far as possible (official data from ministries)**

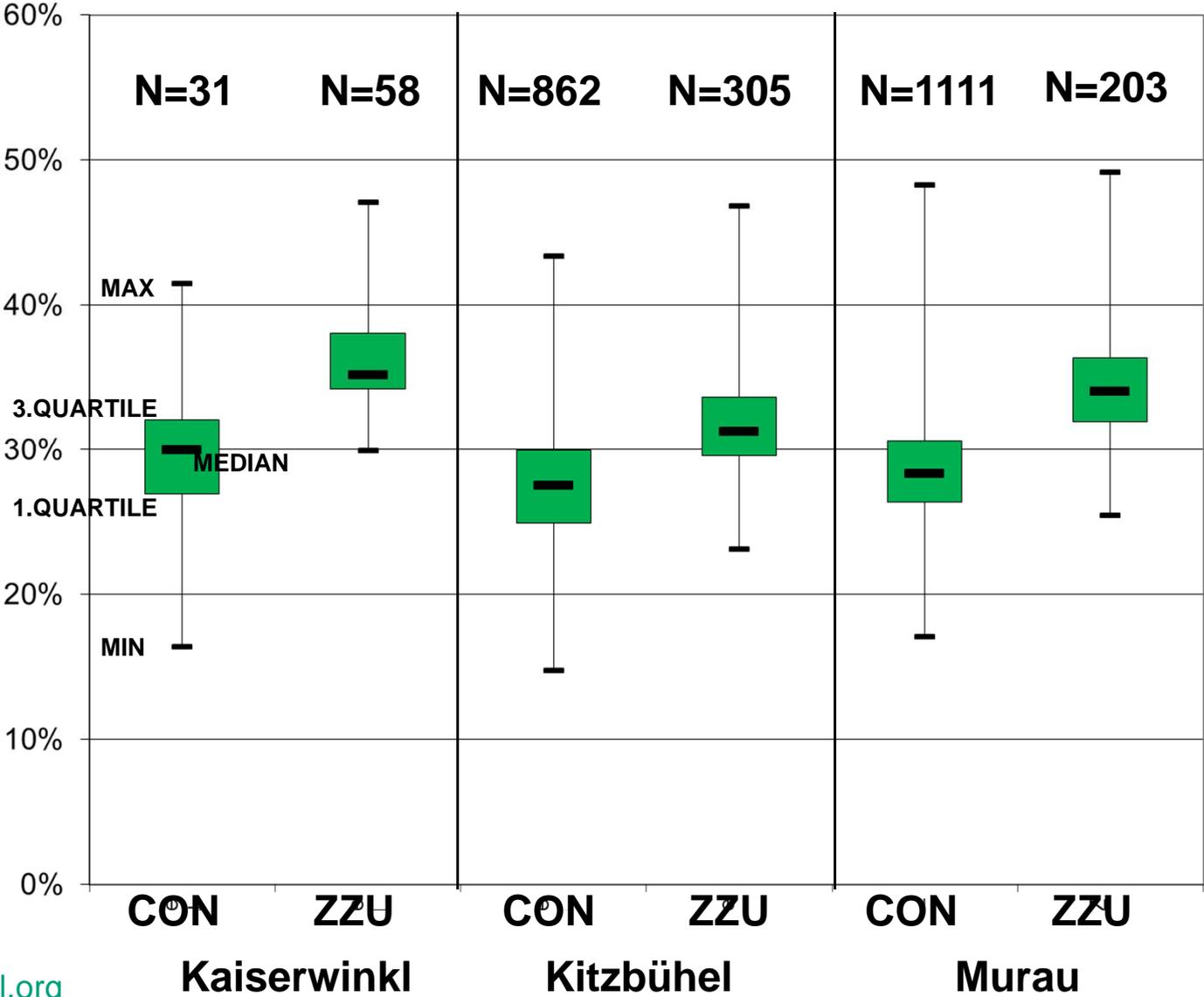
# Overview of the biodiversity assessment model



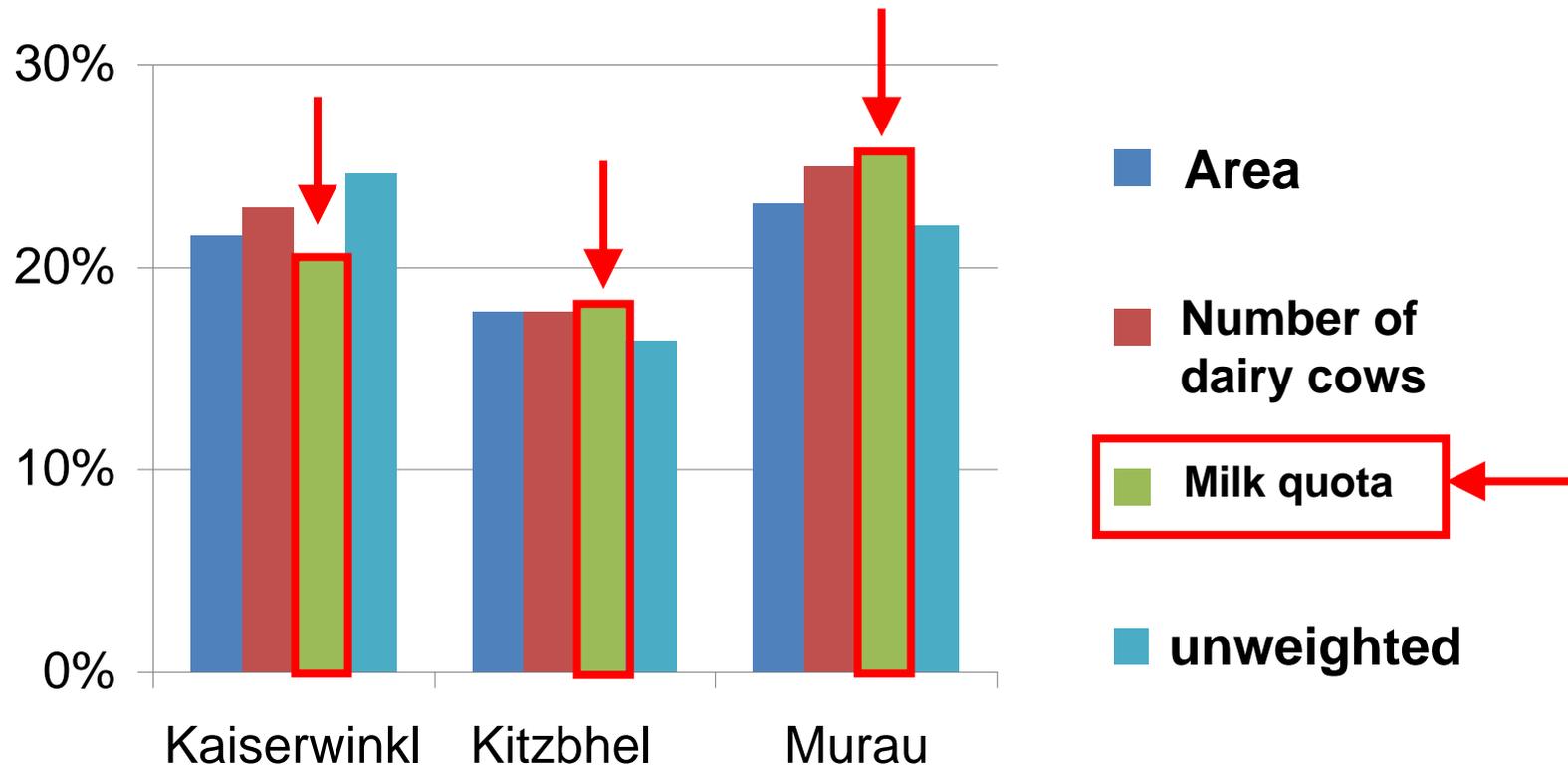
# Parameters

Group of parameters	Parameters (examples)	Relative weight (Hay milk farms)
Entire farm	Nitrogen input, stocking density, etc.	12.3%
Semi natural habitats	Various elements (hedgerows, species-rich meadows and pastures, dry stone walls, ponds, etc.)	57.7%
Arable land and vegetables (crops in rotation)	Reduced tillage, diversified crop rotation, etc.	
Permanent grassland	Wildlife-friendly land use (e.g. use of bar-type mower, cut height) no or reduced use of slurry, etc.	27.3%
Fruits, vine, and other speciality crops	Micro-habitat structures (small elements) (stone heaps, etc.) on the production area, growing resistant varieties, etc.	
Animal husbandry	Rare animal species, own breeding bull, etc.	2.3%
Crop production	Rare plant species, no hybrids, etc.	
Total		100%

# Variation in biodiversity scores among farms



# Relative differences (of arithmetic means) between ZZU and conventional depending on farm weights



# Primary reasons for the differences in biodiversity scores

1. **Greater share of high-quality nature-protection areas**
2. **Higher share of extensive wetlands**
3. **Lower nitrogen intensity due to lower purchase of concentrates**
4. **Ban of synthetic fertilisers and pesticides**
5. **Feeding of hay instead of silage**

# Strengths and limitations of the approach

## › Strengths

- › Comprehensive model of on-farm biodiversity
- › Identification of farm-specific problems
- › Approach useful for monitoring and optimisation of farms
- › Very good data quality as based on official datasets

## › Limitations

- › Not fully compatible with LCA standards
- › Data collection and verification very time consuming
- › Result is always a conservative estimate
- › On-farm validation of the method has not been done (planned for 2011-2013)

# Conclusions

- **Method is suitable to produce sound and plausible results on biodiversity at farm and product level (dairy products)**
- **ZZU dairy products from hay milk have a better performance (biodiversity potential) regarding the three dimensions of biodiversity than conventional products (18-26%)**
- **Performance varies substantially between individual farms => huge optimisation potential**

# Next steps

- › **Calculation of further ZZU supply chains**
  - › Products, regions
- › **Model validation at farm and field level**
- › **Application of model in other EU countries**
- › **Inclusion of other impact categories in the biodiversity model**