agri benchmark

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agri benchmark methods: typical farms

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The concept of typical farms

- Typical farms represent the prevailing production systems, farm sizes, organisation and technologies of farms in defined regions.

- A standard operating procedure was developed to define typical farms.

- Methods for data collection, processing and dissemination of results are standardised.

- Data sets are consistent and collected bottom-up; all return and cost figures can split into quantities and prices

Definition of typical farms

A typical farm is
- an existing farm or a data set describing a farm,
- in a specific region which represents a major share of output for the product considered,
- running the prevailing production system for the product considered,
- reflecting the prevailing combination of enterprises as well as land and capital resources,
- as well as the prevailing type of labour organisation.

A standard operating procedure (SOP) to define typical farms was developed and is used by all partners involved.

agri benchmark-methods: the concept of typical farms

Typical farms

- Selected in terms of size, production system and contribution to the total production of the country / region
- Virtual models based on existing farms
- Full set of economic and physical data

Three sources of data

- Statistics available
- Panel of farmers – consensus data or typified individual farm data
- Expert knowledge of agri benchmark researcher + advisors
  Crosschecking input data with economic results

Typical farm data vs. average and individual farm data

Characteristics	Individual farm data	Average farm data (surveys)	Typical farm data
Representativity	−	+	+ / −
Consistency data sets	+	−	+
Quantity structure	+	−	+
Data availability	+	+ / −	+
Up to date	+	−	+
Feasibility data collection	+	−	+
Data confidentiality	−	+	+
Cost data collection	+ / −	+ / −	+

+ = strength of the sample method; − = weakness of the sample method

Type of farms required
– to be implemented from 2007 onwards

Relevant population for selection of typical farms:

- farms with less than 50 % off-farm income in total income
- and/or farms that can sustain the living of at least one person

3 farms per region, of which

- one moderate sized farm with average management
- one large sized farm with average management
- one large sized farm with top management

Definition **top management**:
- Top 10 % farms with respect to economic success

Definition **economic success** of the farm:
- Farm profit (preferred), otherwise
- gross margin or physical productivity

Number of farms per country

The number of farms per country depends on:

- Scope of analysis: **National vs. global** purposes
- Diversity of **production systems**
  Diversity of **farm size** structure
- **Size** of the country
- **Type** of analysis (status quo or strategy)

- **Financial resources** available to establish and maintain (!) the data base

How to build a Typical Farm

I. **Identification phase** (scientist + advisor)

  – Go strictly branch-wise (e.g. beef, dairy etc.)
  – Select important regions
  – Analyse regional farm structure
  – Define features of two or three typical farms
  – Crosscheck with population and/or survey data

II. **Data collection phase** (scientist, advisor, farmers)

  – Contact farmers who operate such farms („panel")
  – Collect full set of economic and physical farm data

III. **Processing and crosschecking phase**

  – Compute results for the virtual typical farms
  – Cross-check with advisor (farmers); make improvements

I. Identification phase

I.1 What is the purpose of the analysis?

I.2 Which regions and locations to select?

I.3 Which are the farm types where beef is produced?

I.4 What are the typical sizes of beef producing farms and their distribution?

I.5 What are the prevailing production systems in the country and in the regions selected?

I.6 What are the characteristics of the typical farm?

I.1 Purpose of the analysis and farm type

Purpose of analysis	Farm type under consideration
1 Competitiveness	– Farms with a high market share producing for the market and potentially for export
2 Income or social problems of farms	– Small family farms – Commercial farms with cash problems
3 Policy analysis	– Farms mainly affected by policy under analysis
4 Farm strategy analysis	– Farms that need to make substantial changes to become viable
5 Investor information	– Regions with stable framework (political, social, environmental) – Farms with high potential in productivity increase

I.2   Which regions and locations to select?

Check importance of dairy and beef herd

Create maps with spatial distribution

Level of consideration
Farm level, not processing level

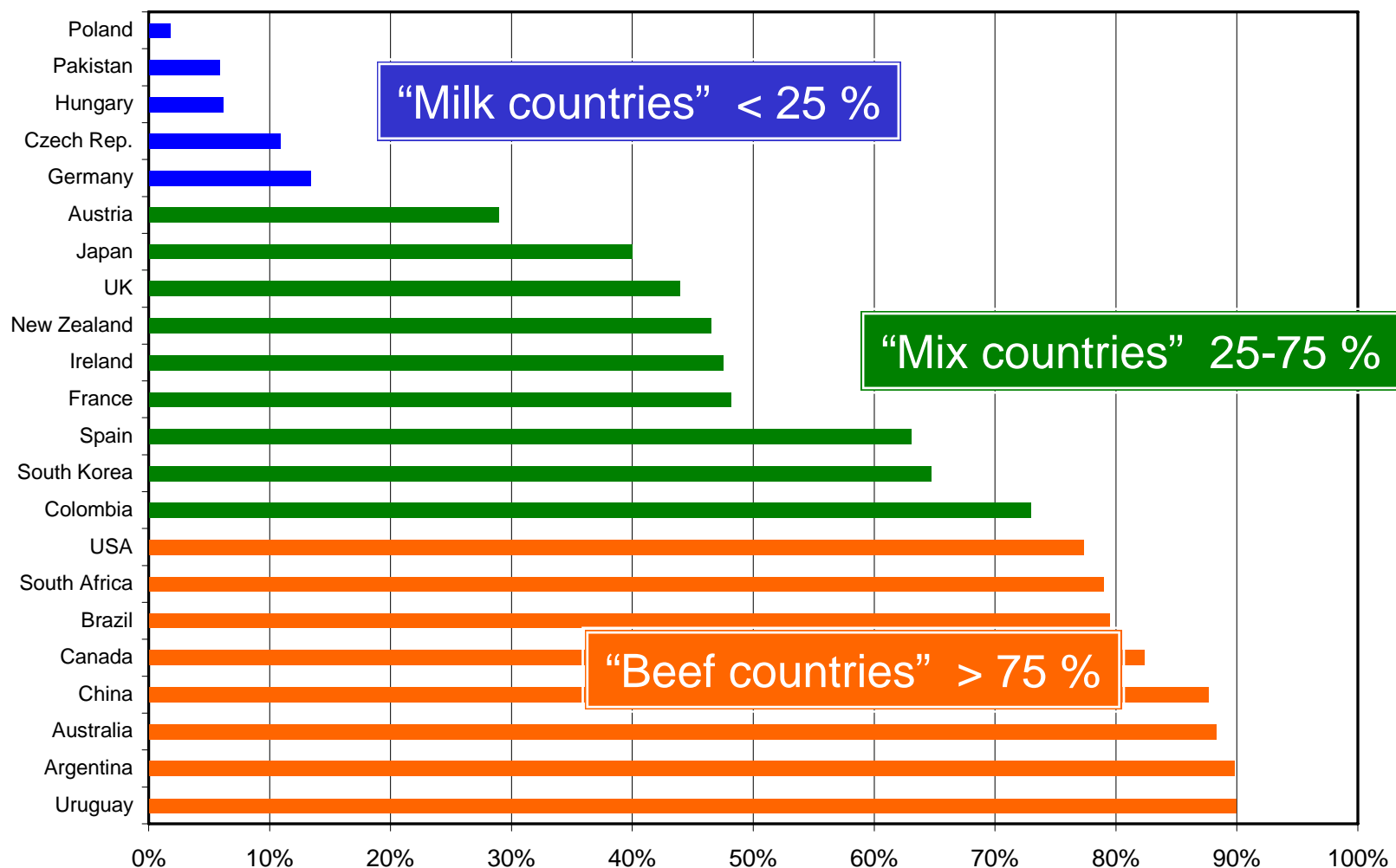**Indicator**
Number of cattle
Number of farms with cattle
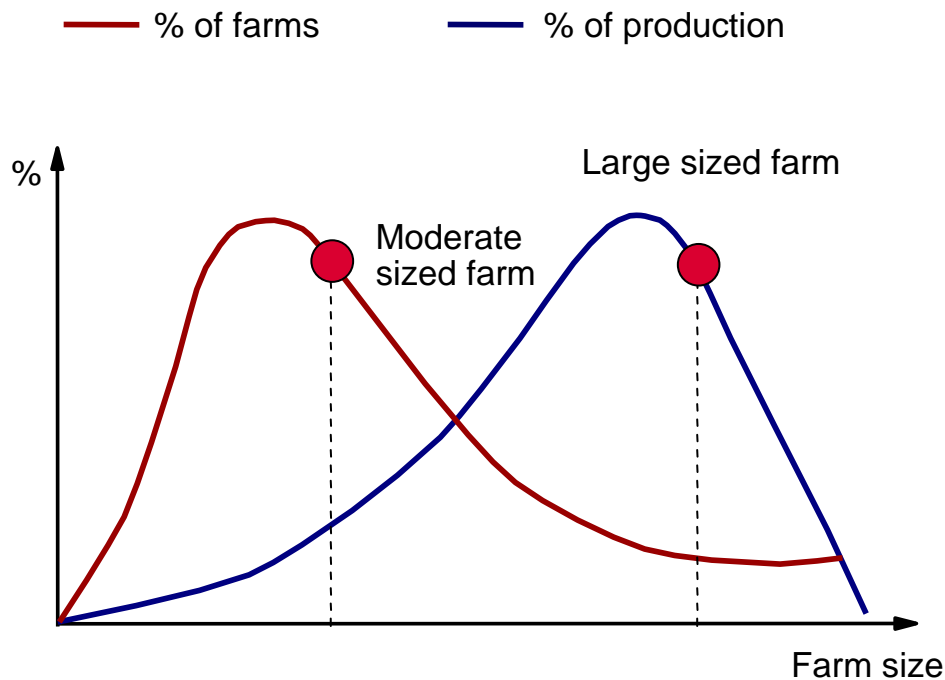
Reference unit
Per region
Per ha agricultural land
Per square kilometre
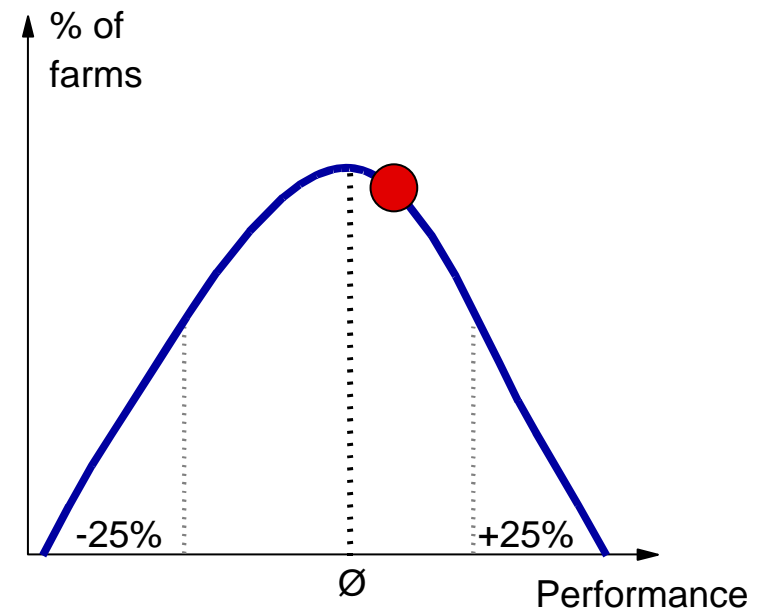
I.2   Share of suckler-cows cows in total cows

Horizontal bar chart — Share of suckler-cows in total cows by country:

Country	Category
Poland	~2%
Pakistan	~6%
Hungary	~7%
Czech Rep.	~11%
Germany	~13%
Austria	~29%
Japan	~40%
UK	~44%
New Zealand	~46%
Ireland	~47%
France	~48%
Spain	~63%
South Korea	~64%
Colombia	~73%
USA	~77%
South Africa	~79%
Brazil	~80%
Canada	~82%
China	~88%
Australia	~88%
Argentina	~90%
Uruguay	~91%

"Milk countries" < 25 %

"Mix countries" 25-75 %

"Beef countries" > 75 %

I.4   Farm size distribution

According to farm size

━━━ % of farms   ━━━ % of production

Large sized farm

Moderate
sized farm

%

Farm size

Basis: All farms in a region

According to economic performance

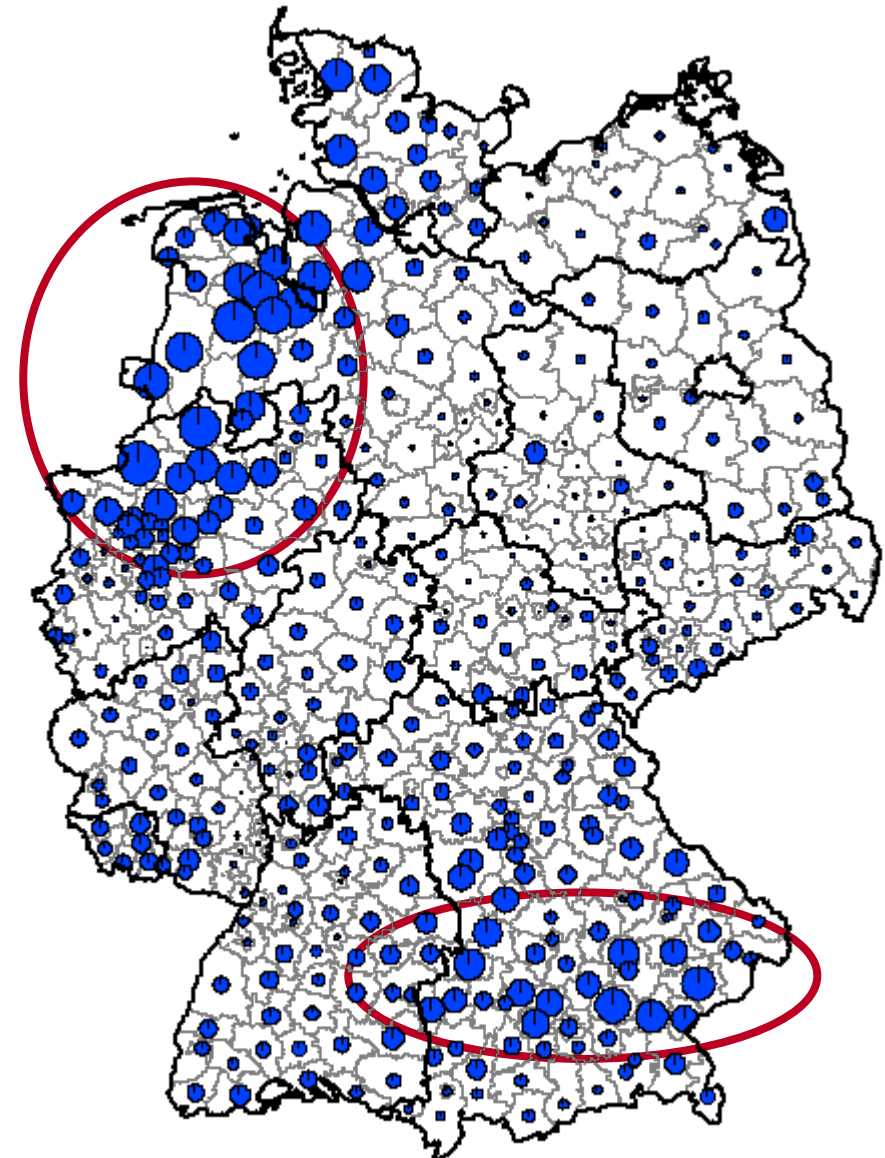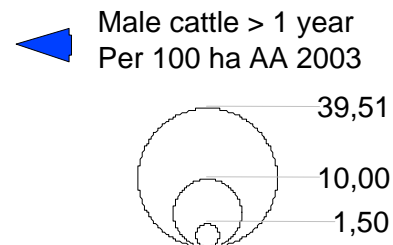% of
farms

-25%   +25%

Ø   Performance

Basis: All farms of one farm size class

🔴 The typical farm within the respective distribution

Identification of important regions
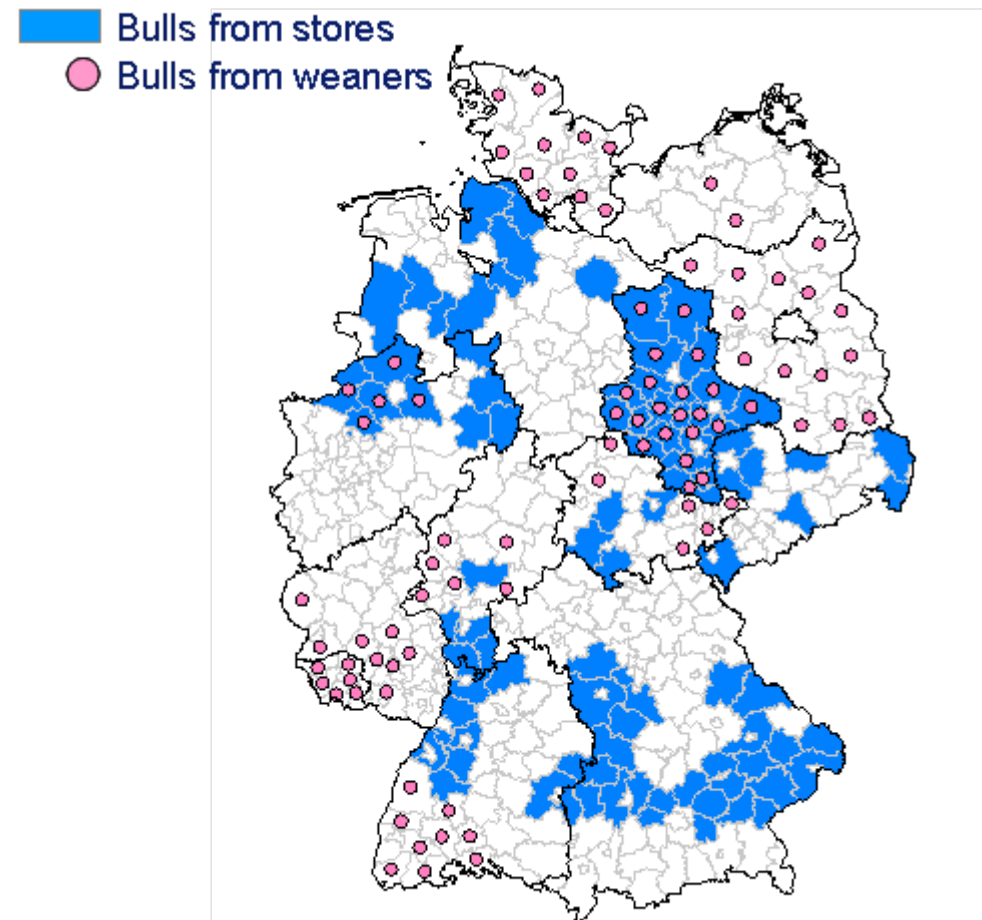
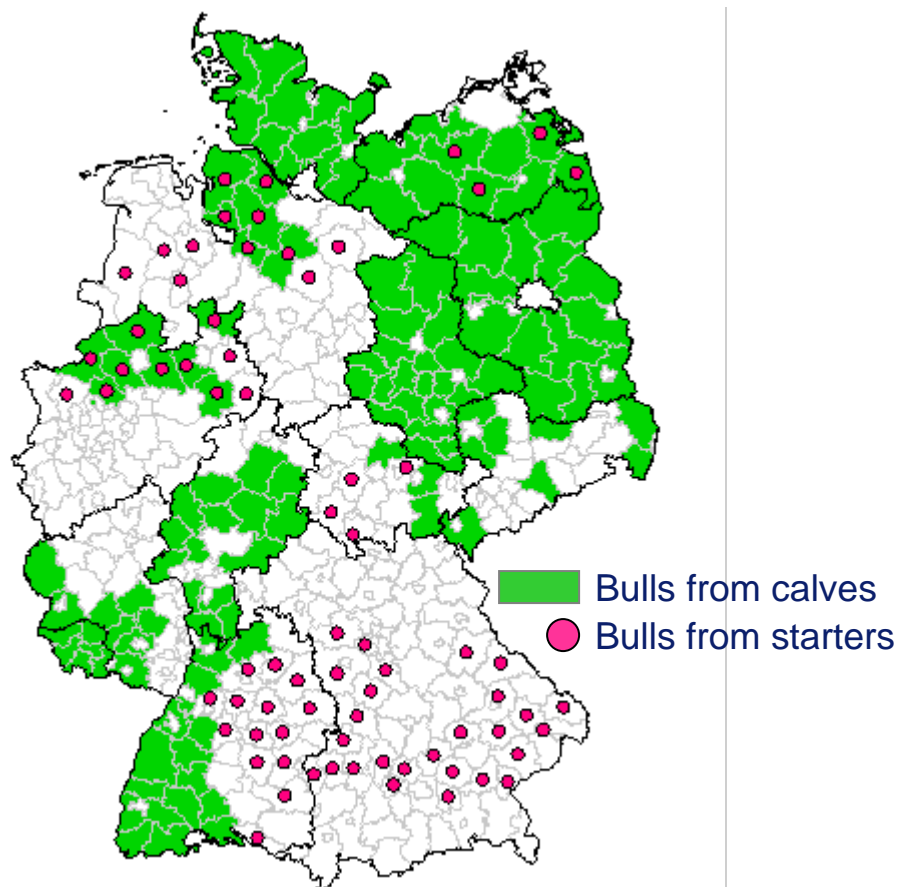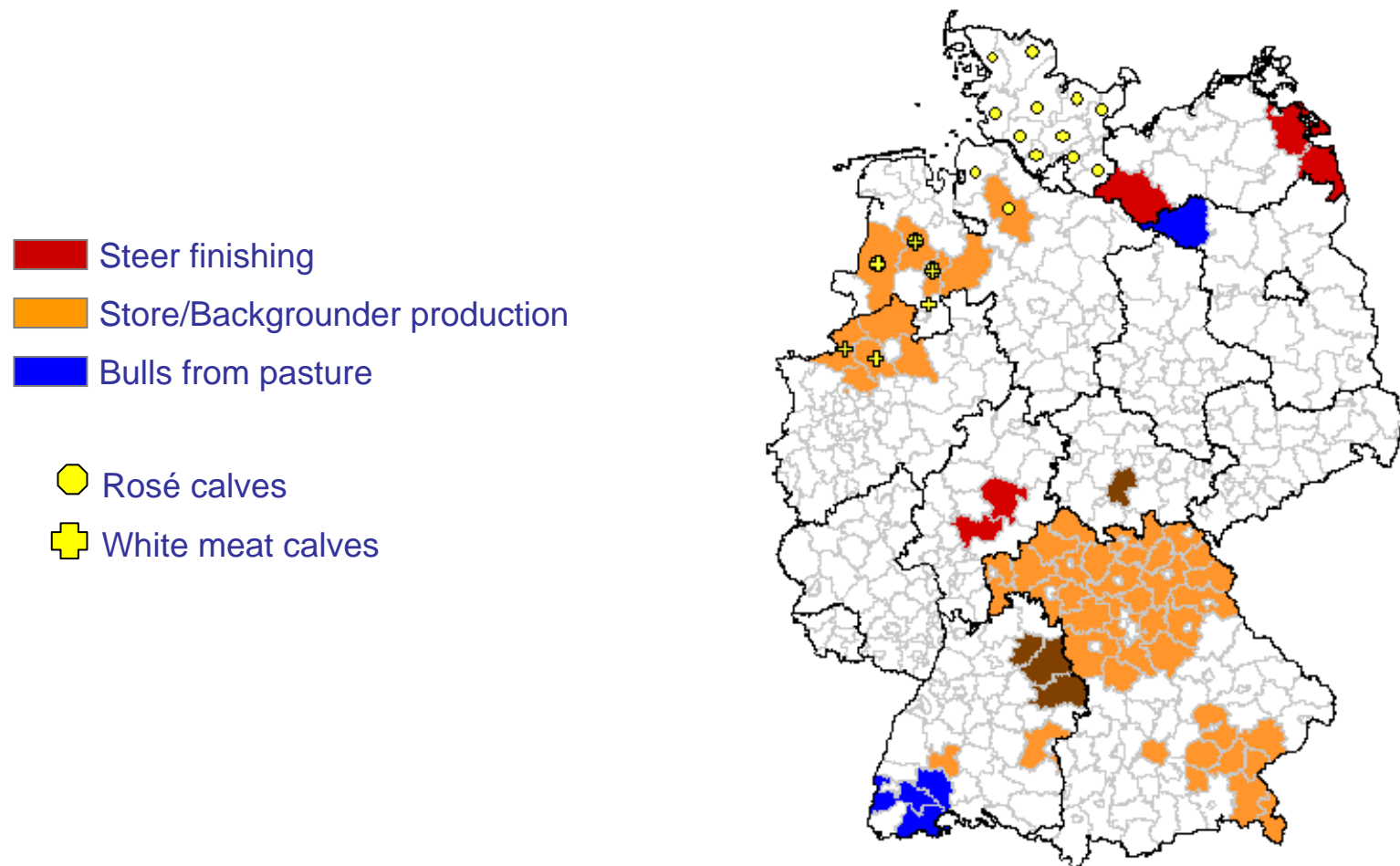**Beef finishing**
Male cattle > 1 year
= finishing bulls

Male cattle > 1 year
Per 100 ha AA 2003

39,51

10,00

1,50

I.5 Production systems of beef production in Germany 2005

	Age at start days	Weight at start kg live weight	Age at end days	Weight at end kg live weight
Bulls from calf	14 - 21	45 - 70	480 - 700	540 - 710
Bulls from starter	28 - 90	65 - 120	495 - 620	650 - 720
Bulls from stores /backgr.	120 - 165	180 - 210	540 - 750	570 - 740
Bulls from weaners	180 - 330	200 - 400	475 - 720	610 - 720
Steers	240 - 300	290 - 300	660 - 720	580 - 660
Stores /backgr. production	28 - 56	65 - 95	100 - 165	180 - 210
Rosé calves from calf/starter	14 - 85	45 - 120	270 - 300	380 - 420
Calf production (white meat)	14	45 - 50	165 - 175	245 - 250
Bulls from pasture	14	45	270 - 360	365 - 425
Bulls concentrate finishing	40 - 210	80 - 220	540 - 570	680 - 720

I.5 Spatial distribution of bull finishing systems in Germany 2005

Bulls from stores
Bulls from weaners

Bulls from calves
Bulls from starters

I.5   Spatial distribution of other finishing systems in Germany 2005

Steer finishing

Store/Backgrounder production

Bulls from pasture

◯ Rosé calves

✚ White meat calves

I.6 Indicators to describe the system – Whole farm level

Dairy farm	Beef finishing farm	Cow calf farm

Whole farm level
 	
Combination with other enterprises
    Crop
    Beef fattening
    Cow calf
    Pig production
    Other
 	
Herd size
 	
Labour organisation
    Mainly family labour
    Mainly paid labour
    Extent contractors used
 	
Capital input
    Old or new buildings
    Type of buildings
    Own machines or contractor
    Loan level
	Whole farm level
	
	Combination with other enterprises
	    Dairy
	    Crop
	    Cow calf
	    Pig production
	    Other
	
	Herd size
	
	Labour organisation
	    Mainly family labour
	    Mainly paid labour
	    Extent contractors used
	
	Capital input
	    Old or new buildings
	    Type of buildings
	    Own machines or contractor
	    Loan level
		Whole farm level
		
		Combination with other enterprises
		    Dairy
		    Crop
		    Beef fattening
		    Pig production
		    Other
		
		Herd size
		
		Labour organisation
		    Mainly family labour
		    Mainly paid labour
		    Extent contractors used
		
		Capital input
		    Old or new buildings
		    Type of buildings
		    Own machines or contractor
		    Loan level

Dairy farm	Beef finishing farm	Cow calf farm
Enterprise level	**Enterprise level**	**Enterprise level**
Breeds	Breeds	Breeds
Own replacement	Origin of animals *Dairy* *Cow calf*	Own replacement
	Category *Bulls, Steers* *Cows, heifers, calves*	
Stocking rate	Stocking rate	Stocking rate
Milk yield	Final weights	Weaning weights
	Daily weight gain	Weaned calves per cow and year
Extent purchase of feed	Extent purchase of feed	Extent purchase of feed
Feed base *Pasture* *Silage and hay from grass* *Other silage and hay* *Grains and others*	Feed base *Pasture* *Silage and hay from grass* *Other silage and hay* *Grains and others*	Feed base *Pasture* *Silage and hay from grass* *Other silage and hay* *Grains and others*
Sale of milk *Domestic* *Export* *Direct sale to consumer*	Sale of beef *Domestic* *Export* *Direct sale to consumer*	Destination of the weaner calves *Slaughter* *Finishing* *Breeding* *Live export*

II   Data collection phase

Always: involvement of advisor and farmers

Always: farm visits (get a picture behind the figures)

Always: crosschecking results

Pre-panel (one scientist, one advisor, one or two farmers)
For benchmarking, cost comparisons,
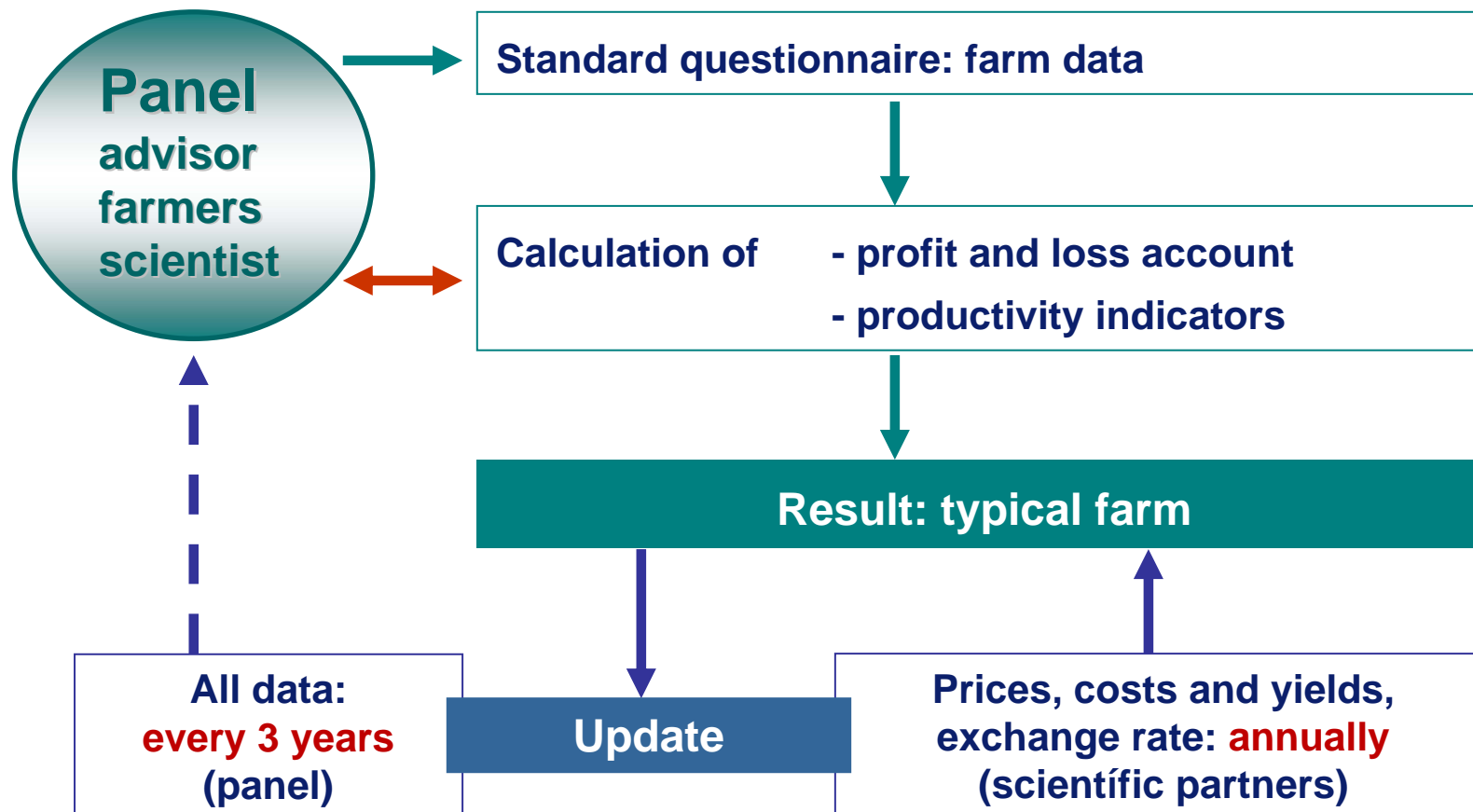production system comparisons and policy analysis

Individual farm data can be used based on step 1 but need to be 'typified', i.e. the farm particularities need to be replaced by typical figures and constellations

Full panel (one scientist, one advisor, four to six farmers)
For the same issues as pre-panel + farm strategy analysis

The panel process
– consensus data gathering

Panel
advisor
farmers
scientist

Standard questionnaire: farm data

Calculation of   - profit and loss account

         - productivity indicators

Result: typical farm

All data:
every 3 years
(panel)

Update

Prices, costs and yields,
exchange rate: **annually**
(scientífic partners)

III   Data processing & crosschecking phase

- Data are processed with TIPI-CAL and additional tools

- Initial results (like farm overview and profit & loss account) are produced and returned to the advisor/farmers

- Cost of production per product unit are calculated in a harmonised procedure for all farms

- Standardised output-formats are produced that can be easily made multi-language

- Partners receive result data bases and can re-arrange figures to national accounting standards

- Partners receive model training and are encouraged to do data processing themselves (exception: annual report)

III   TIPI-CAL

TIPI-CAL is a simulation model
[Technology Impact and Policy Impact Calculations]

- ✓ Production and accounting model
- ✓ Whole farm level and enterprise level (cow-calf, beef finishing, sheep (lamb finishing and ewes), dairy, crop and forage
- ✓ Excel-Spreadsheet
- ✓ Pure simulation without algorithms or optimisation
- ✓ Recursive + optional deterministic/stochastic
- ✓ 'Shareware' for agri benchmark partners and clients
- ✓ Basic model for simulation of single farms
- ✓ Additional modules for cost analysis and data management of dairy, beef, cow-calf and sheep farms