

Farm Level Data in the CAPRI Modeling system

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Outline

- The CAPRI Model
- Definition of “farm types” in CAPRI
- Data sources used to feed the farm type layer
- Baseline construction
- Selected results
- Summary

The CAPRI Model



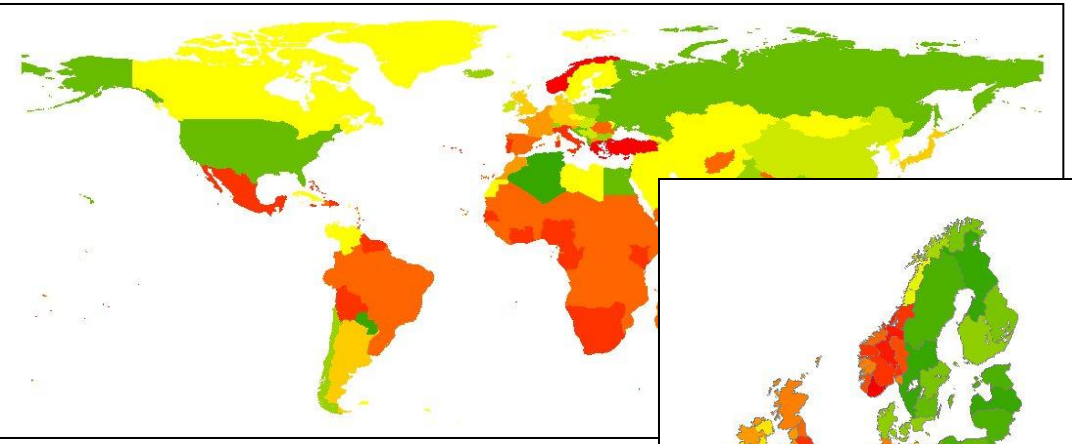


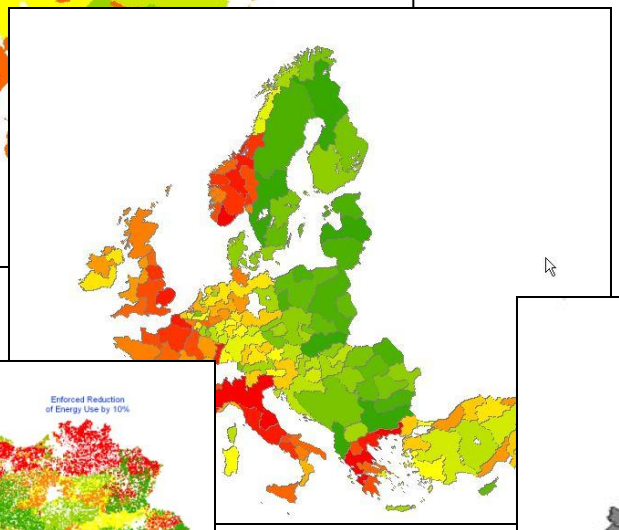






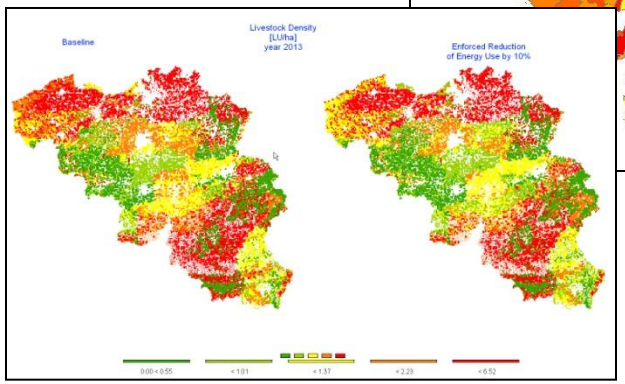
The CAPRI Model

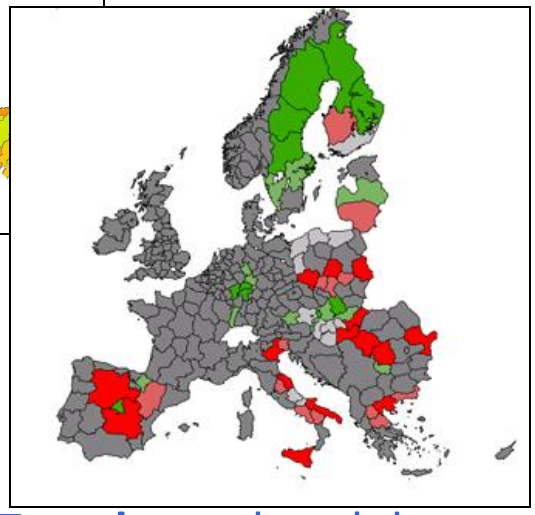




Market Model: global, multi-commodity, spatial, …

Supply Model: regional, optimization, template,… …





Downscaling: statistical breakdown, HSMUs

Farm Type layer: breakdown according to type and size

Farm Types in CAPRI: Some Definitions

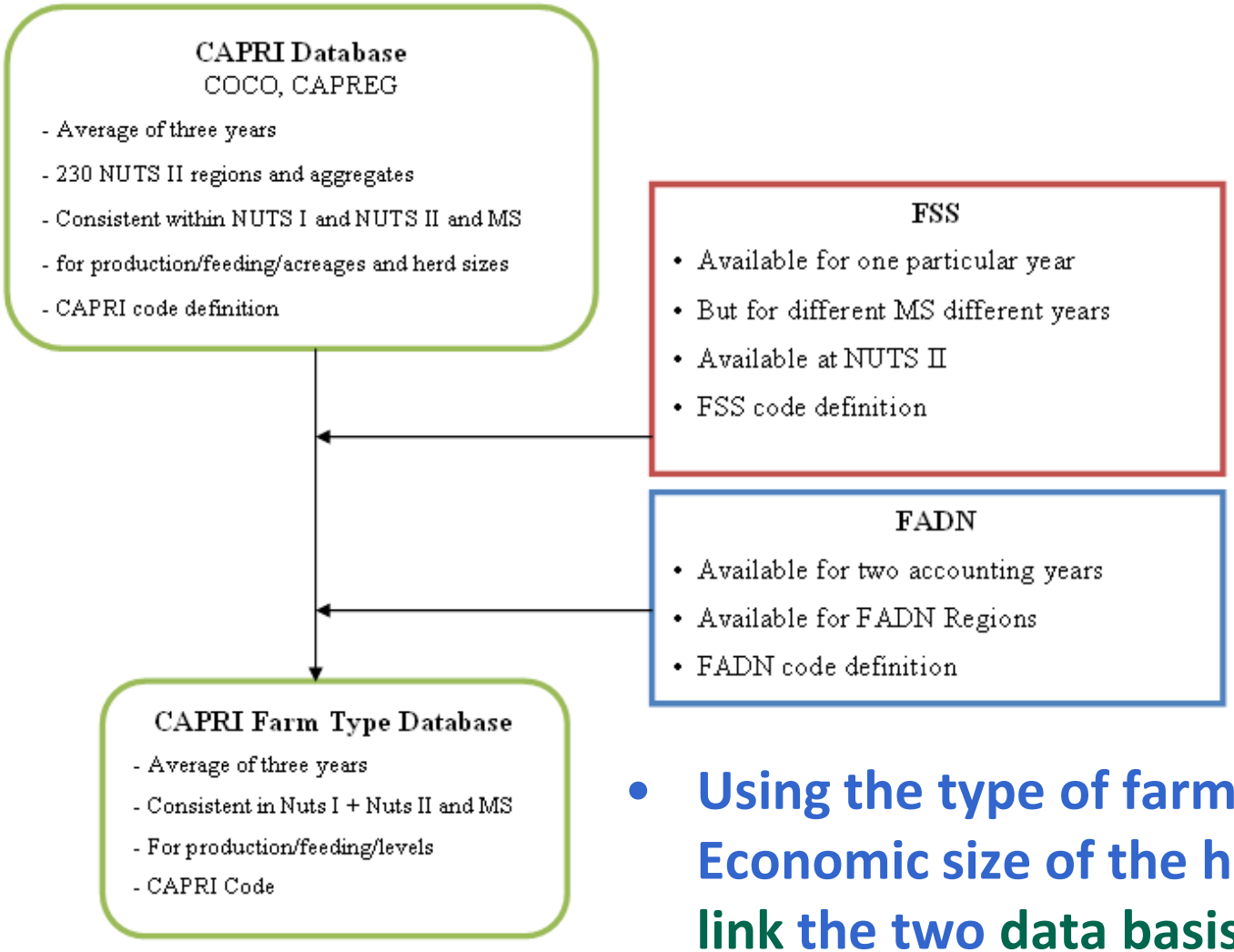
- ***CAPRI farm type layer*:** synonym for the CAPRI model system when applied using the 1823 farm type supply models instead of the 270 regional Nuts2 supply models
- **F*arm type:*** single supply model in the CAPRI. With the exception of the residual farm type, each farm type is characterised by one particular *type of farming* (13 aggregates) and *economic size class* (3 aggregates). A farm type also has a regional dimension, which refers to the MS and sub-regional level of Nuts2.
- ***MS-aggregated farm type:*** is an aggregate of farm types for one particular MS by *type of farming* and *economic size class*.

Farm Types: Definition

Type of farming		Economic size class	
Specialist cereals, oilseed and protein crops	13	ESC 1	< 16 ESU
General field cropping + Mixed cropping	14_60	ESC 2	≥ 16 ≤ 100 ESU
Specialist horticulture	20	ESC 3	> 100 ESU
Specialist vineyards	31		
Specialist fruit and citrus fruit	32		
Specialist olives	33		
Various permanent crops combined	34		
Specialist dairying	41		
Specialist cattle + dairying rearing, fattening	42_43		
Sheep, goats and other grazing livestock	44		
Specialist granivores	50		
Mixed livestock holdings	70		
Mixed crops-livestock	80		

- **Maximum of nine of the most important farm types per Nuts2 region plus a residual farm group**
- **Definition of the farm supply models: type of farming (85/377/EEC), economic size of the holding (85/377/EEC) and NUTS II Region (EUROSTAT)**

Databases Used

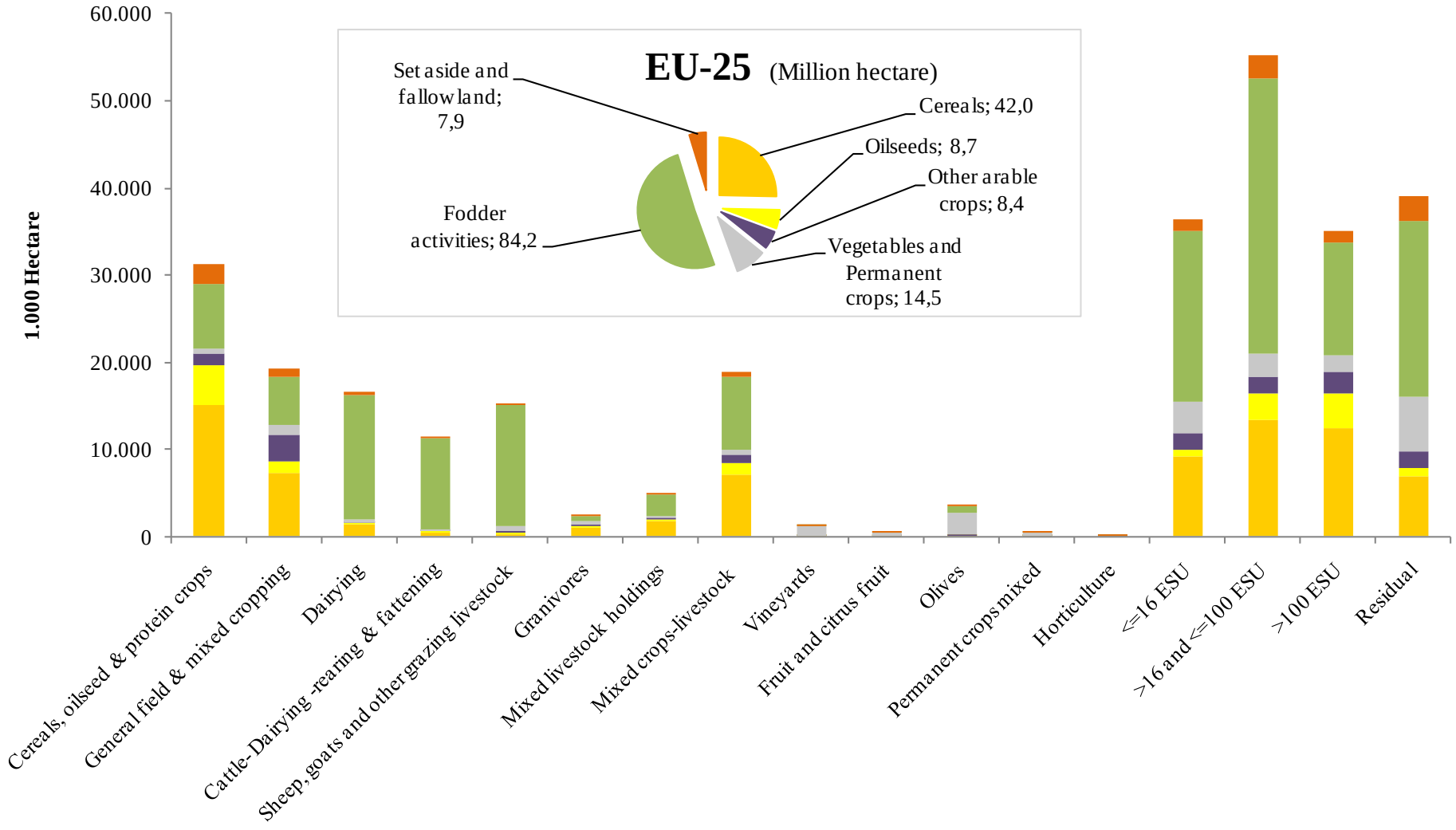


- **Using the type of farming and Economic size of the holding we can link the two data basis FADN, FSS (aggregation made by Eurostat)**

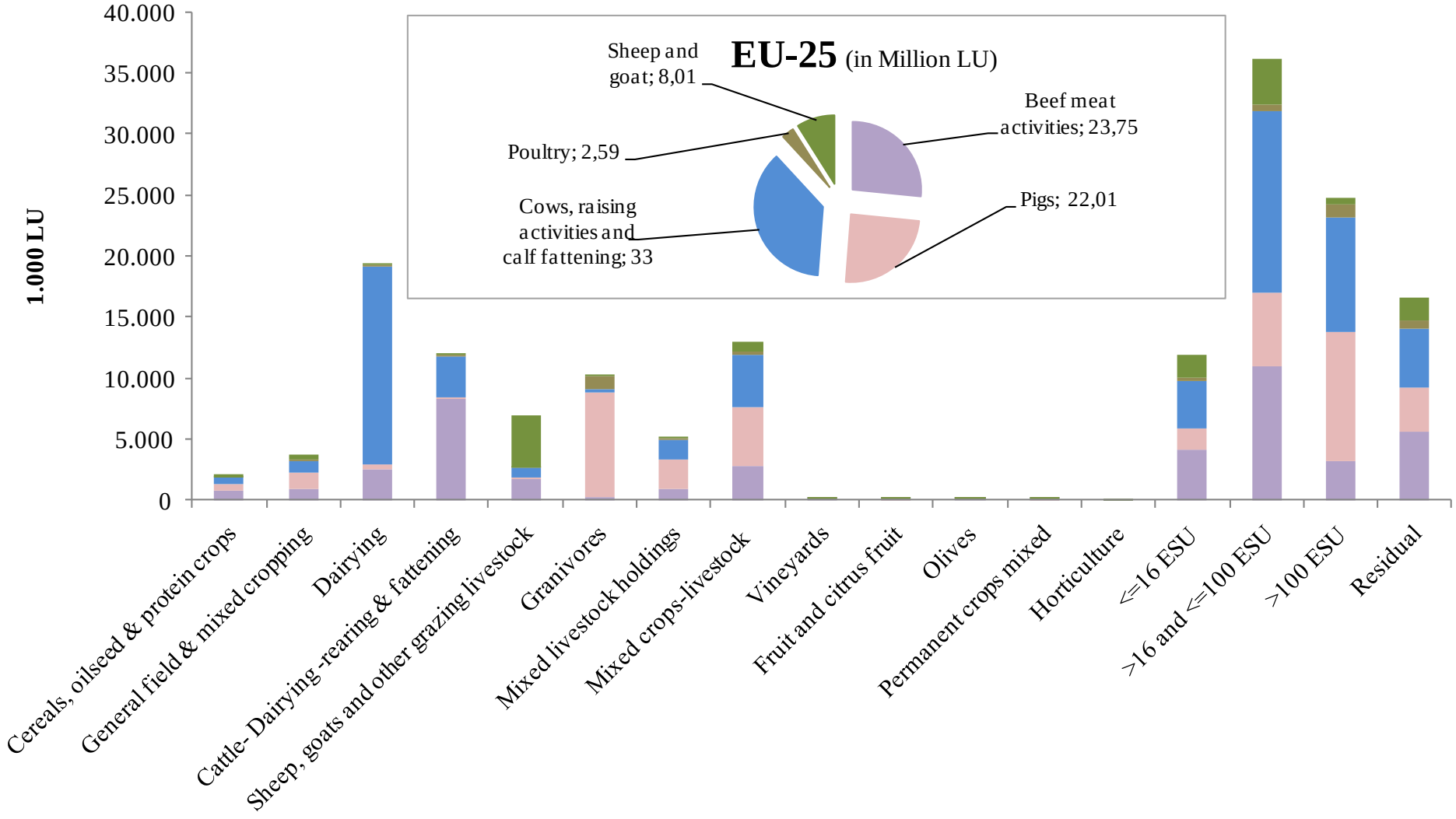
Main Indicators Used

	EU-27				EU-15				EU-10			
	No. of Farm Supply Models	Utilized Agricultural Area	No. of Holdings	Livestock Units	No. of Farm Supply Models	Utilized Agricultural Area	No. of Holdings	Livestock Units	No. of Farm Supply Models	Utilized Agricultural Area	No. of Holdings	Livestock Units
Type of Farming	No.		Million		No.		Million		No.		Million	
Cereals, oilseed & protein crops	245	32.2	1.	2.1	173	25.6	.7	1.9	72	6.6	.3	.2
General field & mixed cropping	251	20.	1.8	3.7	201	14.9	.9	3.	50	5.1	.9	.7
Dairying	235	16.9	.5	19.4	205	15.3	.4	18.5	30	1.7	.2	.9
Cattle- Dairying -rearing & fattening	149	11.7	.4	12.	133	10.9	.3	11.6	16	.8	.1	.4
Sheep, goats and other grazing livestock	172	15.5	.5	6.9	159	15.1	.4	6.8	13	.4	.	.1
Granivores	118	2.7	.2	10.2	76	1.6	.	8.8	42	1.	.2	1.4
Mixed livestock holdings	85	5.1	.5	5.1	53	1.8	.1	3.	32	3.3	.4	2.1
Mixed crops-livestock	276	19.8	.9	13.	214	12.7	.3	11.	62	7.1	.7	2.
Vineyards	22	1.4	.2	.1	21	1.4	.2	.1	1			
Fruit and citrus fruit	13	.6	.2	.1	13	.6	.2	.1				
Olives	25	3.6	.8	.2	25	3.6	.8	.2				
Permanent crops mixed	16	.5	.2	.1	15	.5	.2	.1	1			
Horticulture	5	.1			5	.1						
Economic Size Class												
<=16 ESU	486	36.6	6.	11.9	342	22.4	3.2	7.5	144	14.2	2.7	4.4
>16 and <=100 ESU	673	56.8	1.	36.2	602	52.8	1.	34.7	71	3.9	.1	1.5
>100 ESU	453	36.6	.2	24.8	349	28.8	.2	22.8	104	7.8		2.
Residual	211	39.5	3.1	16.6	170	32.7	2.3	15.	41	6.8	.8	1.5
Total	1,823	169.4	10.2	89.4	1,463	136.7	6.6	80.	360	32.8	3.6	9.4

Cropping Pattern EU25 (in million ha)



Animals EU-25 in million livestock Units (LU)



Constructing a Baseline in 2020

	Base year 2005	Baseline 2020
Political variables		
Milk Quota EU-25 in million tonnes	133	-
Sugar Quota EU-27 in 1.000 tonnes	17,000	12,400
Macroeconomic Assumptions (EU-27)		
Population growth in % p.a.	-	0.04%
Crude oil price in $ per barrel	38	104
Inflation in % p.a.	-	1.90%
Other Trends (EU-27)		
New energy crops second generation in 1.000 hectares	0	1,500
Prices for important products (EU-27, €/t)		
Cereals	104	140
Oilseeds	202	224
Beef	1,714	2,507
Dairy products	1,282	1,393
Struktural change		
EU-25 No. of Holdings in Mio	10.2	
EU-15 No. of Holding in Mio	6.6	constant
EU-10 No. of Holding in Mio	3.6	
Land Use (EU27, 1000 ha)		
Used Agricultural Area	191,272	187,419
Pasture	65,309	64,910
Arable land	125,962	122,509

EU projections calibrated to the Aglink-Cosimo Outlook

Scenario Analysis: Agricultural Income Change per Farm Type (EU25, year 2004)

Farm Type	Health Check as implemented	Health Check with flat national rates	Absolute change	% change
	million EUR	million EUR	million EUR	%
Cereals, oilseed and protein crops	15 179	13 969	-1 210	-8%
General field cropping + Mixed cropping	18 566	18 364	-202	-1%
Horticulture	802	804	2	0%
Vineyards	4 123	4 308	185	4%
Fruit and citrus fruit	2 498	2 498	-1	0%
Olives	4 694	4 042	-652	-14%
Various permanent crops combined	1 057	1 028	-29	-3%
Dairying	22 488	23 665	1 177	5%
Cattle-rearing and fattening	6 568	6 826	257	4%
Sheep, goats and other grazing livestock	8 704	9 747	1 043	12%
Granivores	7 771	7 741	-30	0%
Mixed livestock holdings	4 277	4 300	23	1%
Mixed crops-livestock	15 279	15 085	-194	-1%
Residual	45 570	46 681	1 111	2%
Total EU25			1 481	1.46%

Scenario Analysis: Distribution of Income Changes per Farm Type (EU25, year 2004)

Farm Type	% of farms with decreasing income	% of farms with stable income	% of farms with increasing income
Cereals, oilseed and protein crops	43	18	38
General field cropping + Mixed cropping	45	10	45
Horticulture	20	0	80
Vineyards	5	9	86
Fruit and citrus fruit	62	8	31
Olives	56	4	40
Various permanent crops combined	56	6	38
Dairying	10	18	72
Cattle-rearing and fattening	42	13	45
Sheep, goats and other grazing livestock	26	9	65
Granivores	30	31	39
Mixed livestock holdings	31	29	40
Mixed crops-livestock	34	17	49
Residual	27	5	67
Total EU25	31	15	54

Limitations of the Approach

- Use of structurally identical and relatively simple template models, differences between farm types and regions are expressed solely by parameters.
- Not completely capturing the full diversity of farming systems in Europe (e.g. evaluation of policy measures that impact farm management decisions, such as manure handling or feeding practices).
- Simple representation of agricultural technology in CAPRI compared to approaches that are parameterised based on biophysical models narrows the scope of extensions in that direction.
- Distinction between *production development* (crop allocation and animal herd size) and *composition* (# of farms in a group) not possible → structural change module needed *(in development)*

Current Applications of the Farm Type Layer

2007-2010	2 IPTS-financed studies on the development of the module (see the IPTS web)
2009 – 2010	DEFRA Land abandonment study
2010	Scenarios for OECD (paper declassified)
2009 - 2013	CAPRI-RD
since 2010	German Baseline at VTI
2011 - 2014	FADNTOOL FP7 Consortium
2011 – 2012	Modelling the Effects of the CAP on Farm Structural Change (IPTS)

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