

SmartCow: fostering synergies through mapping cattle research infrastructure, technologies and research databases

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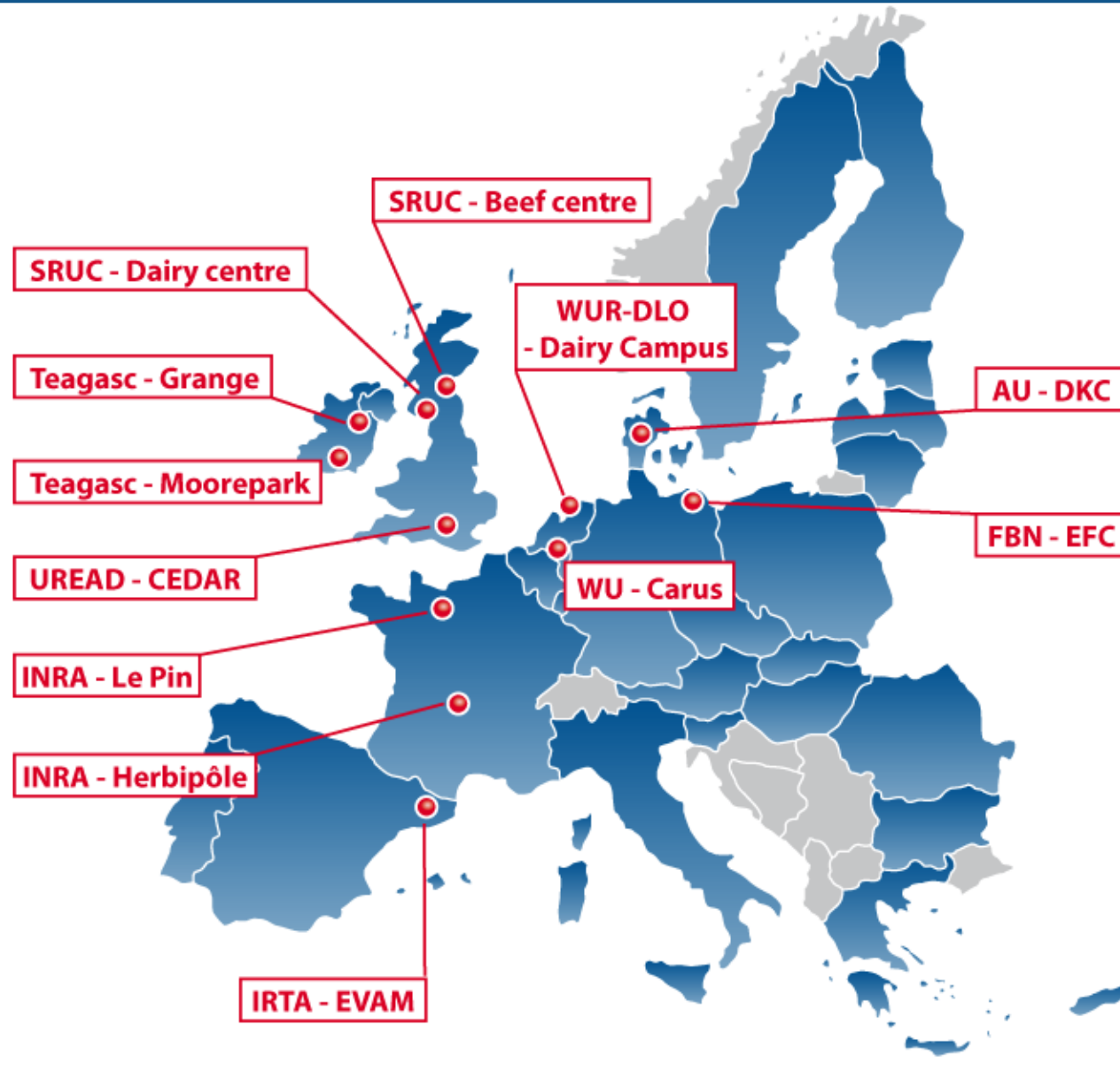
SmartCow – WP 1 - *Objectives*

- **ESFRI roadmap** identified the need for improved coordination, harmonisation and access to European research infrastructures (RIs) of farm animals.
- **Objectives**
 - To develop synergies by mapping and linking research projects, needs and major research infrastructures and technologies on cattle in Europe
- **Specific objectives are to create:**
 1. An inventory of European animal RIs (Task leader: Idele)
 2. An inventory of research animal databases and existing sample banks (Task leader: Teagasc)
 3. A catalogue of available equipment and related techniques (Task leader: Teagasc)

SmartCow – WP 1 - *Methods*

- **Within the consortium, a common database was designed and sent to each RI**
- **EAAP is developing an interactive map**
 - Name of the institute, address, website and field of interest
 - Link to page with complete info about institute on map
 - <http://www.smartcow.eu/map/>
- **Outside the consortium, an online survey is launched**
 - <http://limesurvey42.idele.fr/index.php/338737?lang=en>

SmartCow - Research Infrastructures



SmartCow – WP 1 – Database structure

	A	B	C	I	J	K	L	M	N	O	P	Q	R	S	T	
1	Staff Numbers					Description of Facility										
2	Country	Institute	Research Facility/Installation	Stakeholder type	No. Technicians	No. Farm Staff	No. Researchers /Engineers	No. administration staff	No. other staff	Soil type	Rainfall (mm)	Climate	Altitude (m)	Total land area (ha)	Grassland area (ha)	Crop
3	Ireland	Teagasc	Moorepark	Public	2	10	24	4	7	Free-draining	1029.4	Temperate	46	111	101	0
4	Denmark	Aarhus U	Danish Cattle	Public	3	17	20	1	4	sand/clay	906	Temperate	40	439	103	
5	The Netherlands	Wageningen	Carus	Public	3	15	20	4	5	Sand / peat	780 mm/yr	Temperate	9	24	24	
6	Spain	IRTA	EVAM	Public	1	6	1	1	3		567	Mediterranean	60	70	0	
7	France	INRA	Le Pin	Public	5	14	4	2		Clay/loam	723	Temperate	200	450	400	
8	Scotland	SRUC	Easter Howg		4	7	10	1	N/A	Clay/ loam	1125	Temperate	250	981	920	
9	Scotland	SRUC	Dairy Research	Public	4	8	5	1	0	Sandy loam	1200	Temperate	100	300	180	
10	Germany	FBN	Barn	Public	10	12	1	1	0	Clay/loam	588	Temperate	43	7	7	
11	Germany	FBN	RespCham	Public	5	0	10	1	13	Clay/loam	588	Temperate	43	7	7	
12	Germany	FBN	ExpPhysRoo	Public	5	0	10	1	13	Clay/loam	588	Temperate	43	7	7	
13	Germany	FBN	BehavArena	Public	2	0	9	1	10	Clay/loam	588	Temperate	43	7	7	
14	Ireland	Teagasc	Grange	Public	2	4	7	2	10	Clay/loam	1192	Temperate	83	150	150	
15	France	INRA	Herbipôle-L	Public	7	11	4	1	1	1 volcanic andos	1051		1000 to 1450	550	550	
16	France	INRA	Herbipôle-M	Public	10	11	2	1	2	volcanic andos	1160		1000 to 1250	390	390	
17	France	INRA	Herbipôle-T	Public	14	13	5	1	3	volcanic andos	771		850	160	156	
18	Belgium	CRAW	Experimenti	Public	4	7	4	1	0	loam	818	Temperate	155	24 (300 for all C	20	250 (fo
19	England	University	CEDAR	Public	7	6	1	1	3	Clay/Gravel	647	Temperate	45	760	380	
20	Netherlands	WUR	Dairy Campu	Public	0	20	2	2	3	Clay	800	Temperate	-2	328	266	
21																
22																
23																
24																

1. Description of infrastructure characteristics
2. Description of equipments and related techniques
3. Description of animal databases and sample banks

RIs main characteristics

- Staff Numbers
- Description of Facility
- Description of Animals
- Animal Housing
- Animal Handling Facilities
- Ethics -details collected
- Laboratory Facilities

RIs main characteristics

- Twelve of the centres are dairy-based and five of the centres are beef focused
- Dairy cow numbers totalled ~2500 across the RIs, the breed type dominated by Holstein-Friesian cows
- Total beef cow numbers were ~1000, dominated by Limousin, Angus, Simmental and Charolais breeds
- The calving spread was spring-calving in Ireland, all other countries had calving split between spring and autumn



Rls main equipment and related techniques

- Weather Station
- Water Quality analysis
- Milking and Milk Analysis Facilities
- Bodyweight and Body Condition Score (BCS)
- Blood sample analysis
- Thermography
- Fertility
- Feed Dry Matter Intake (DMI)
- Feed & Intake Technique (eg N-alkane) Processing
- Methane
- Behaviour
- Digestive System Analysis
- Meat Characteristics
- Sample storage
- Freeze Drying
- Near Infrared Spectroscopy (NIRS)



RI - Capabilities (Focus on Methane measurement)

- Animal measurement capabilities was very relatively standard across RIs
- Consortium has excellent expertise in animal methane methodology
 - Six RIs have enclosed chambers
 - Seven RIs have capability using the SF6 technique
 - Eight RIs have the Green Feed - methane measurement technology



RIs databases and sample banks

- Database Description- detail recorded
- Animals- details collected
- Animal Behaviour - details recorded
- Welfare - frequency of recording & detail collected
- Health Measurements -details recorded
- Fertility -details recorded
- Thermography details recorded
- Weighing - frequency recorded
- Body Condition Score (BCS)- frequency recorded
- Skeletal Measurements- frequency recorded
- Meat Characteristics- frequency recorded
- Milk Yield- frequency recorded and details collected
- Milk Composition- frequency recorded
- Milk Composition Parameters - details collected
- Diet - details recorded
- Dry Matter Intake (DMI) Measurement - frequency recorded & detail collected
- Blood samples - details collected
- Calorimeter/Metabolism house - details collected
- Samples scanned using Near Infrared Spectroscopy (NIRS) -details recorded



Interactive Map - <http://www.smartcow.eu/map/>

Institutes Map



List of Institutes

Institute	Research Facility/Installation	Address	Farm Type	Stakeholder type	Website
Aarhus University, Department of Animal Science	Danish Cattle Research Centre	AU Foulum, Blichers Alle 20, 8830 Tjele, Denmark	Experimental Farm	Public	go to website
CRAW	Experimental dairy farm	Rue de Liroux 8 5030 Gembloux, Belgium	Experimental Farm	Public	go to website
FBN	Barn	Wilhelm-Stahl-Alle 2, 18196 Germany	Experimental Farm	Public	go to website
FBN	RespCham	Wilhelm-Stahl-Alle 2, 18196 Germany	Experimental Farm	Public	go to website



Online survey to extend the mapping of RIs

- To inventory the experimentation and demonstration infrastructures of the European cattle sector,
- To give them more visibility through the interactive map and so foster synergies and new cooperation.
- <http://limesurvey42.idele.fr/index.php/338737?lang=en>
- Final question:
 - Would you like to complete the full Infrastructure database from the SmartCow program ?
 - If you say yes, you will be contacted by SmartCow to complete more detailed information on your infrastructure



Concluding message

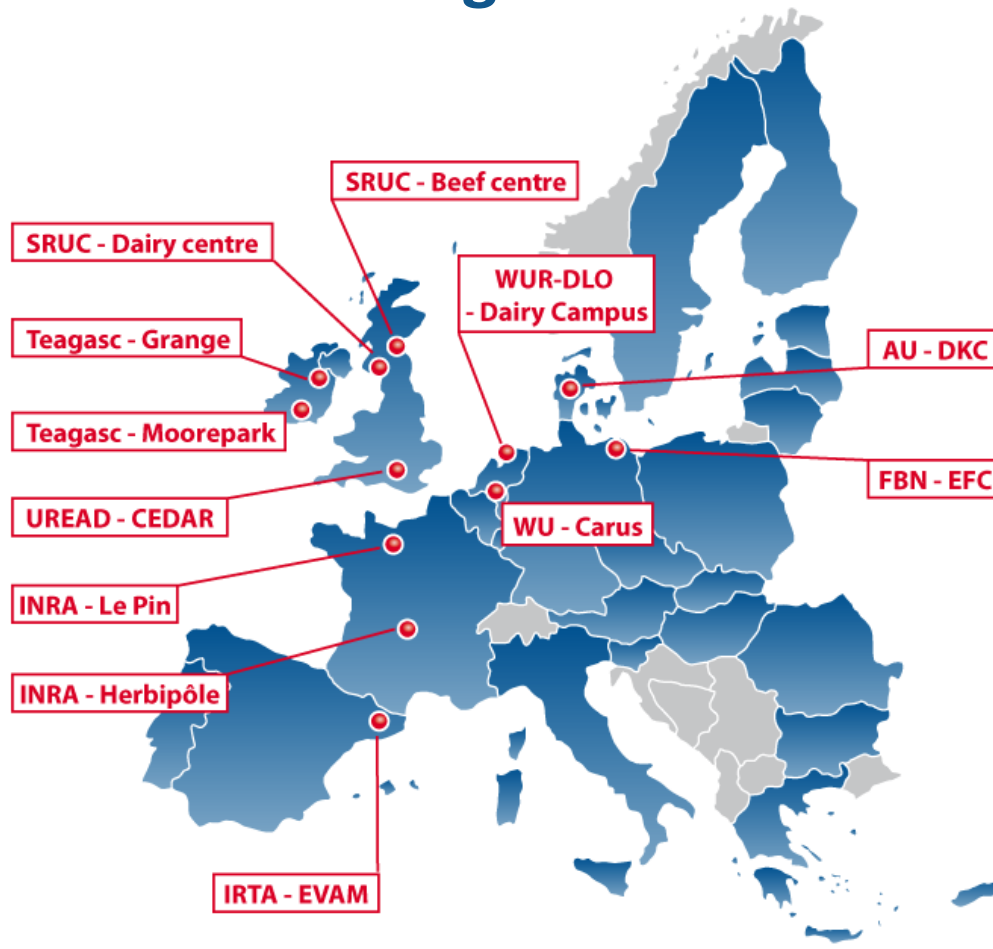
- Next step is to complete the mapping of RIs in SmartCow participating countries and in the rest of Europe
- We are also counting on your help to disseminate the online survey in your network



Thank you for your attention



SmartCow at a glance



First-class Cattle Research Infrastructures (RIs) across Europe:

- 11 major RIs distributed in 7 EU countries
- 12 locations, which include 18 installations
- 2500 dairy and 1000 beef cows
- **Networking of RIs** to inventorize resources, harmonize procedures, and share data
- **Joint research activities** to improve experimental methods and phenotyping capability
- **Interaction with stakeholders** to stay in line with industry needs and improve dissemination
<http://www.smartcow.eu/stakeholders/>

TRAINING PROGRAM

For Scientists, Technicians, Stakeholders, PhD students

- Face-to-face training courses
- Free web-conferences
- One-day study tours in 4 different countries
<http://www.smartcow.eu/resources/training/>

TRANSNATIONAL ACCESS CALLS

Offers external users (academic and industry) free access to SmartCow RIs

- 30 projects during the 4 years of SmartCow
- Access to around 10,000 cow-weeks

<http://www.smartcow.eu/calls/>



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