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Horizon 2020 Programme

INFRAIA-02-2017
Integrating Activities for Starting Communities

SmartCow: an integrated infrastructure for increased research capability and innovation in the European cattle sector

SmartCow
an integrated infrastructure for increased research capability and innovation in the European cattle sector

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SmartCow

an integrated infrastructure for increased research capability and innovation in the European cattle sector

EXECUTIVE SUMMARY

Background	SmartCow is a European project integrating key European cattle research infrastructures. Its objective is to promote the coordinated use and development of these infrastructures, and thereby help the European cattle sector face the challenges of sustainable production. By covering all the relevant scientific fields and the diversity of cattle types and production systems, SmartCow will provide easy access to high quality services and resources to academic and private research communities. For instance, access to research results, free trainings, national meetings with stakeholders and project applications TNA (transnational access) to conduct experiments in the project's infrastructures. Such services and resources are needed to develop innovative and ethical solutions for efficient use of animal and feed resources, promoting animal welfare and healthy livestock, as well as sustainable competitiveness. To build close links and synergies within the European research community working on cattle, the first step is to identify and characterize European research infrastructures.
Objectives	The objective of this task is to create an inventory that describes and maps the principal animal research infrastructures of the project partners.
Methods	A contact person from each research institute within the consortium was identified at the kick off meeting and their email address obtained. An exhaustive list of general information about the research infrastructures was developed and an excel spread sheet created to collect the data. Before sending to all project partners, the file was sent to a smaller group of people involved in the project to review and identify any areas which were missing or where more information was required. Once this sub-committee was satisfied with database, it was sent to the people within the consortium whose email addresses were collected at the kick off meeting. Once all information was returned it was collated into one document, validated and sent to partners working on Tasks 1.1 and 3.1 to allow them to further their respective work packages.

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Results & implications	The creation of a database cataloguing 12 research infrastructures of the SmartCow partners, corresponding to 19 installations (or facilities). This database will be used to create an interactive map, as well as for other work packages of the project.

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1 Description of the Database

1.1 Construction of the database

The objective of SmartCow project is to promote the coordinated use and development of European research infrastructures, and thereby help the European cattle sector face the challenges of sustainable production. In order to do so, the first step is to identify and characterize the research infrastructures of project partners.
In that purpose, a database was created on an excel file, in order to collect administrative information and catalogue the project partners' research infrastructures on:

- Site characteristics (rain fall, type of soil, rotation…)
- Feed systems (grazing, feed purchase…)
- Animal types and breeds
- Housing systems
- Animal handling facilities
- Laboratory facilities
- Ethical aspects

1.2 Collection of the information

To collect all the information needed, a pre-filled excel file was sent to person in charge of each research infrastructure. Then, the information was gathered in a unique database.

1.3 Infrastructures catalogued

The final database gathers all the information, previously listed, from 12 research infrastructures.
All the research infrastructures catalogued and their country are summarized in the following table:

Country	Institute	Research infrastructure	Installations
France	INRA	Pôle experimental bovin (PEB)	Le Pin
			Herbipôle-Theix
			Herbipôle-Laqueuille
			Herbipôle-Marcenat
Scotland	SRUC	Dairy Research Centre	Dairy centre
		Beef centre	Beef centre 1 & 2
The Netherlands	Wageningen University	Carus	Carus
The Netherlands	WU-DLO	Dairy Campus	Dairy Campus
England	University of Reading	CEDAR	CEDAR
Germany	FBN	FBN-EFC	Barn
			ExpPhysRoom
			RespCham
			BehavArena
Ireland	Teagasc	Moorepark	Moorepark
		Grange	Grange
Denmark	Aarhus University	Danish Cattle Research Centre	AU1 & 2
Spain	IRTA	EVAM	EVAM
Belgium	CRAW	Experimental dairy farm	??

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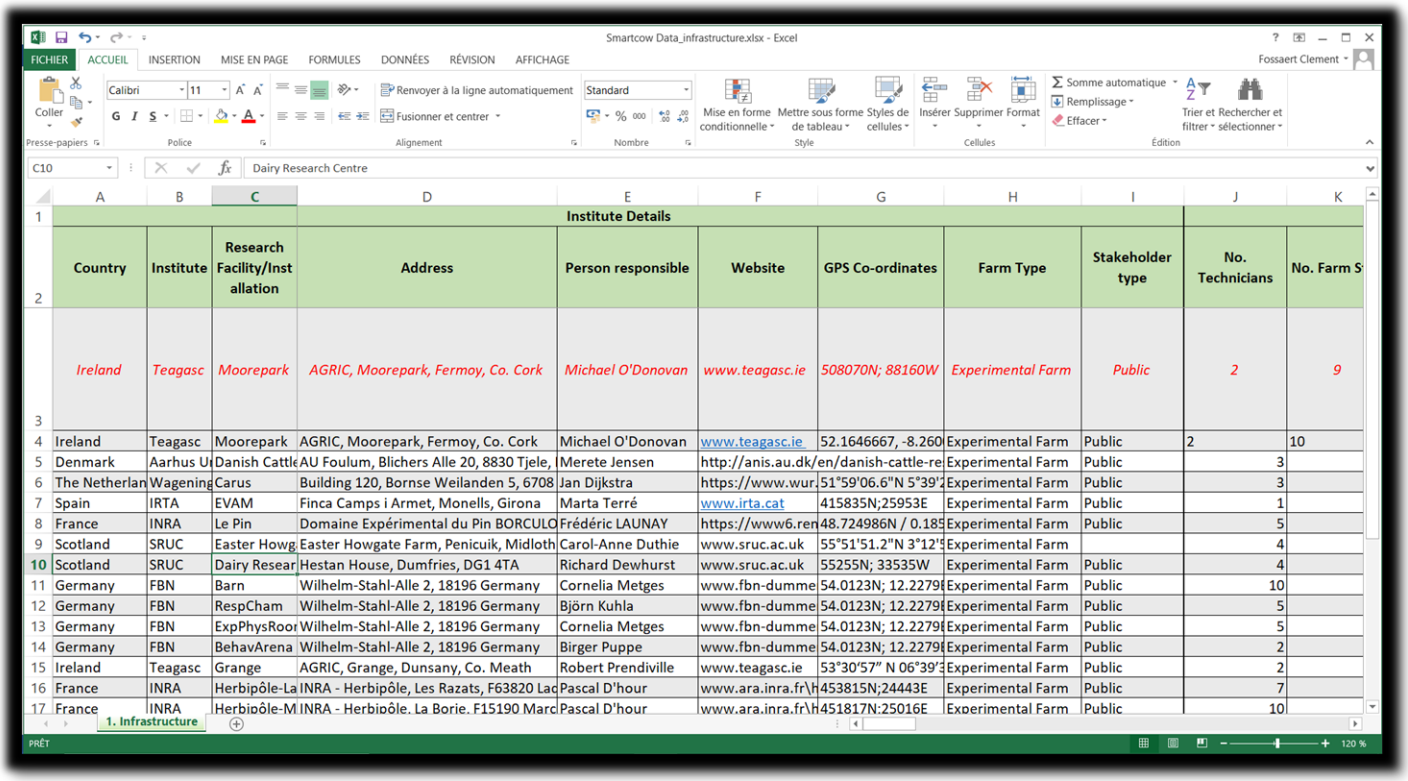
1.3.1 Overview of data collected

To give an overview of the content of the database, the following are screen shots of the data which have(?) been collected and passed to the relevant people in Task 1.1 and Task 3.1 to allow them to progress their respective areas.



	A	B	C	D	E	F	G	H	I	J	K
1				Institute Details							
2	Country	Institute	Research Facility/Installation	Address	Person responsible	Website	GPS Co-ordinates	Farm Type	Stakeholder type	No. Technicians	No. Farm S
3	*Ireland*	*Teagasc*	*Moorepark*	*AGRIC, Moorepark, Fermoy, Co. Cork*	*Michael O'Donovan*	*www.teagasc.ie*	*508070N; 88160W*	*Experimental Farm*	*Public*	*2*	*9*
4	Ireland	Teagasc	Moorepark	AGRIC, Moorepark, Fermoy, Co. Cork	Michael O'Donovan	www.teagasc.ie	52.1646667, -8.260	Experimental Farm	Public	2	10
5	Denmark	Aarhus U	Danish Cattle	AU Foulum, Blichers Alle 20, 8830 Tjele,	Merete Jensen	http://anis.au.dk/en/danish-cattle-re		Experimental Farm	Public	3	
6	The Netherlan	Wagening	Carus	Building 120, Bornse Weilanden 5, 6708	Jan Dijkstra	https://www.wur.	51°59'06.6"N 5°39'	Experimental Farm	Public	3	
7	Spain	IRTA	EVAM	Finca Camps i Armet, Monells, Girona	Marta Terré	www.irta.cat	415835N;25953E	Experimental Farm	Public	1	
8	France	INRA	Le Pin	Domaine Expérimental du Pin BORCULO	Frédéric LAUNAY	https://www6.ren	48.724986N / 0.185	Experimental Farm	Public	5	
9	Scotland	SRUC	Easter Howg	Easter Howgate Farm, Penicuik, Midloth	Carol-Anne Duthie	www.sruc.ac.uk	55°51'51.2"N 3°12'5	Experimental Farm		4	
10	Scotland	SRUC	Dairy Resear	Hestan House, Dumfries, DG1 4TA	Richard Dewhurst	www.sruc.ac.uk	55255N; 33535W	Experimental Farm	Public	4	
11	Germany	FBN	Barn	Wilhelm-Stahl-Alle 2, 18196 Germany	Cornelia Metges	www.fbn-dumme	54.0123N; 12.2279	Experimental Farm	Public	10	
12	Germany	FBN	RespCham	Wilhelm-Stahl-Alle 2, 18196 Germany	Björn Kuhla	www.fbn-dumme	54.0123N; 12.2279	Experimental Farm	Public	5	
13	Germany	FBN	ExpPhysRoor	Wilhelm-Stahl-Alle 2, 18196 Germany	Cornelia Metges	www.fbn-dumme	54.0123N; 12.2279	Experimental Farm	Public	5	
14	Germany	FBN	BehavArena	Wilhelm-Stahl-Alle 2, 18196 Germany	Birger Puppe	www.fbn-dumme	54.0123N; 12.2279	Experimental Farm	Public	2	
15	Ireland	Teagasc	Grange	AGRIC, Grange, Dunsany, Co. Meath	Robert Prendiville	www.teagasc.ie	53°30'57" N 06°39'	Experimental Farm	Public	2	
16	France	INRA	Herbipôle-La	INRA - Herbipôle, Les Razats, F63820 Lac	Pascal D'hour	www.ara.inra.fr\h	453815N;24443E	Experimental Farm	Public	7	
17	France	INRA	Herbipôle-M	INRA - Herbipôle, La Borie, F15190 Marc	Pascal D'hour	www.ara.inra.fr\h	451817N:25016E	Experimental Farm	Public	10	

Figure 1. List of research institutes and some general information

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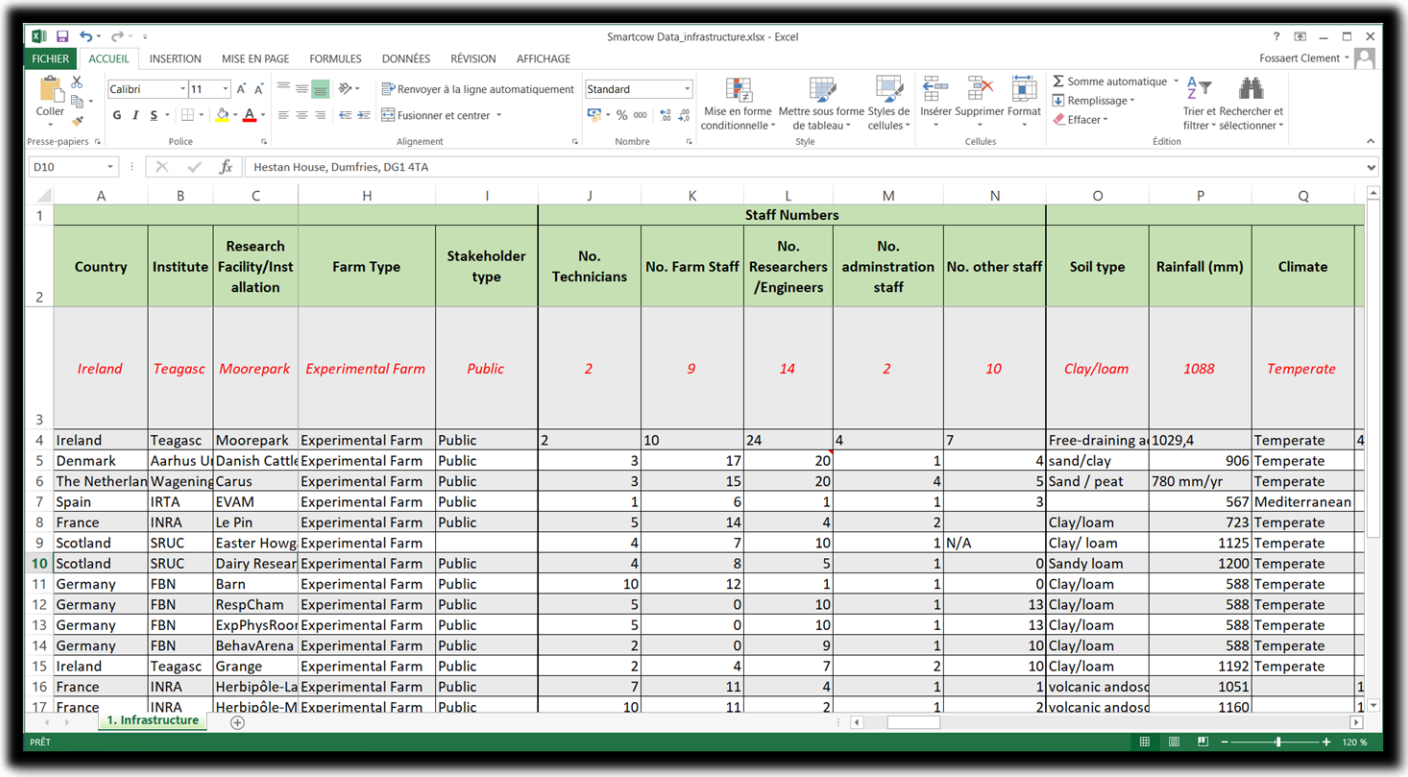
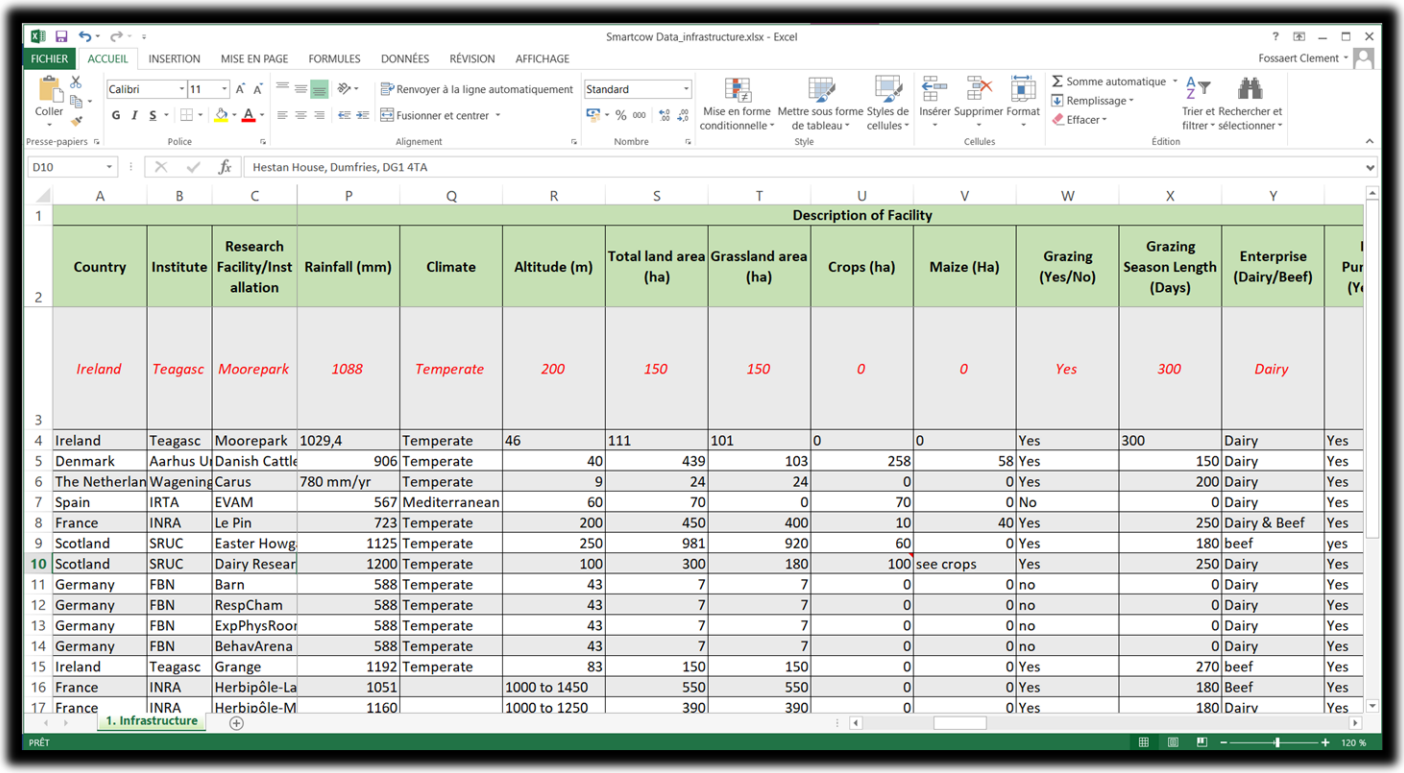


	A	B	C	H	I	J	K	L	M	N	O	P	Q
1						Staff Numbers							
2	Country	Institute	Research Facility/Installation	Farm Type	Stakeholder type	No. Technicians	No. Farm Staff	No. Researchers /Engineers	No. adminstration staff	No. other staff	Soil type	Rainfall (mm)	Climate
3	*Ireland*	*Teagasc*	*Moorepark*	*Experimental Farm*	*Public*	*2*	*9*	*14*	*2*	*10*	*Clay/loam*	*1088*	*Temperate*
4	Ireland	Teagasc	Moorepark	Experimental Farm	Public	2	10	24	4	7	Free-draining a	1029,4	Temperate
5	Denmark	Aarhus U	Danish Cattle	Experimental Farm	Public	3	17	20	1	4	sand/clay	906	Temperate
6	The Netherlan	Wagening	Carus	Experimental Farm	Public	3	15	20	4	5	Sand / peat	780 mm/yr	Temperate
7	Spain	IRTA	EVAM	Experimental Farm	Public	1	6	1	1	3		567	Mediterranean
8	France	INRA	Le Pin	Experimental Farm	Public	5	14	4	2		Clay/loam	723	Temperate
9	Scotland	SRUC	Easter Howg	Experimental Farm		4	7	10	1	N/A	Clay/ loam	1125	Temperate
10	Scotland	SRUC	Dairy Resear	Experimental Farm	Public	4	8	5	1	0	Sandy loam	1200	Temperate
11	Germany	FBN	Barn	Experimental Farm	Public	10	12	1	1	0	Clay/loam	588	Temperate
12	Germany	FBN	RespCham	Experimental Farm	Public	5	0	10	1	13	Clay/loam	588	Temperate
13	Germany	FBN	ExpPhysRoor	Experimental Farm	Public	5	0	10	1	13	Clay/loam	588	Temperate
14	Germany	FBN	BehavArena	Experimental Farm	Public	2	0	9	1	10	Clay/loam	588	Temperate
15	Ireland	Teagasc	Grange	Experimental Farm	Public	2	4	7	2	10	Clay/loam	1192	Temperate
16	France	INRA	Herbipôle-La	Experimental Farm	Public	7	11	4	1	1	volcanic andosc	1051	
17	France	INRA	Herbipôle-M	Experimental Farm	Public	10	11	2	1	2	volcanic andosc	1160	

Figure 2. List of research institutes and their staff numbers



	A	B	C	P	Q	R	S	T	U	V	W	X	Y
1				Description of Facility									
2	Country	Institute	Research Facility/Installation	Rainfall (mm)	Climate	Altitude (m)	Total land area (ha)	Grassland area (ha)	Crops (ha)	Maize (Ha)	Grazing (Yes/No)	Grazing Season Length (Days)	Enterprise (Dairy/Beef)
3	*Ireland*	*Teagasc*	*Moorepark*	*1088*	*Temperate*	*200*	*150*	*150*	*0*	*0*	*Yes*	*300*	*Dairy*
4	Ireland	Teagasc	Moorepark	1029,4	Temperate	46	111	101	0	0	Yes	300	Dairy
5	Denmark	Aarhus U	Danish Cattle	906	Temperate	40	439	103	258	58	Yes	150	Dairy
6	The Netherlan	Wagening	Carus	780 mm/yr	Temperate	9	24	24	0	0	Yes	200	Dairy
7	Spain	IRTA	EVAM	567	Mediterranean	60	70	0	70	0	No	0	Dairy
8	France	INRA	Le Pin	723	Temperate	200	450	400	10	40	Yes	250	Dairy & Beef
9	Scotland	SRUC	Easter Howg	1125	Temperate	250	981	920	60	0	Yes	180	beef
10	Scotland	SRUC	Dairy Resear	1200	Temperate	100	300	180	100	see crops	Yes	250	Dairy
11	Germany	FBN	Barn	588	Temperate	43	7	7	0	0	no	0	Dairy
12	Germany	FBN	RespCham	588	Temperate	43	7	7	0	0	no	0	Dairy
13	Germany	FBN	ExpPhysRoor	588	Temperate	43	7	7	0	0	no	0	Dairy
14	Germany	FBN	BehavArena	588	Temperate	43	7	7	0	0	no	0	Dairy
15	Ireland	Teagasc	Grange	1192	Temperate	83	150	150	0	0	Yes	270	beef
16	France	INRA	Herbipôle-La	1051		1000 to 1450	550	550	0	0	Yes	180	Beef
17	France	INRA	Herbipôle-M	1160		1000 to 1250	390	390	0	0	Yes	180	Dairy

Figure 3. List of research institutes and some information about their facility

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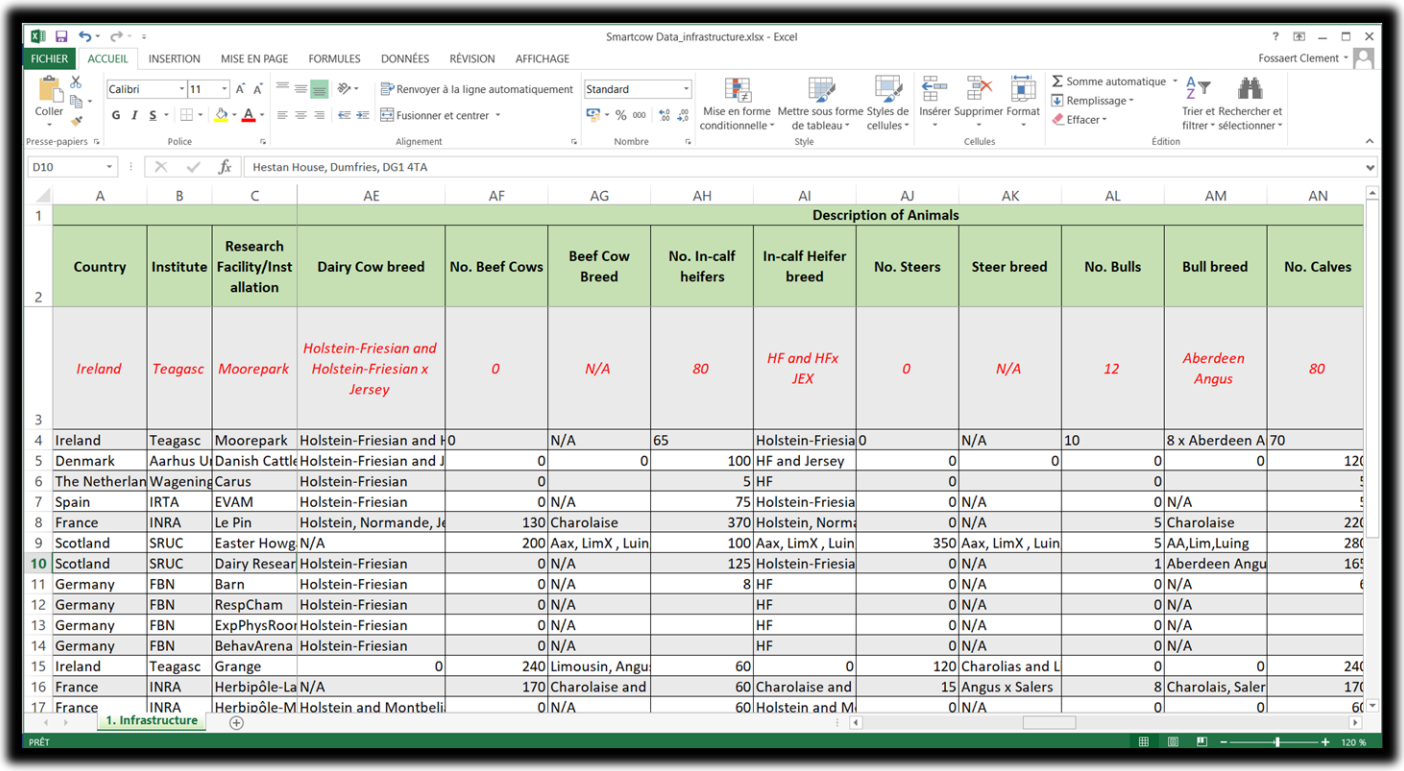
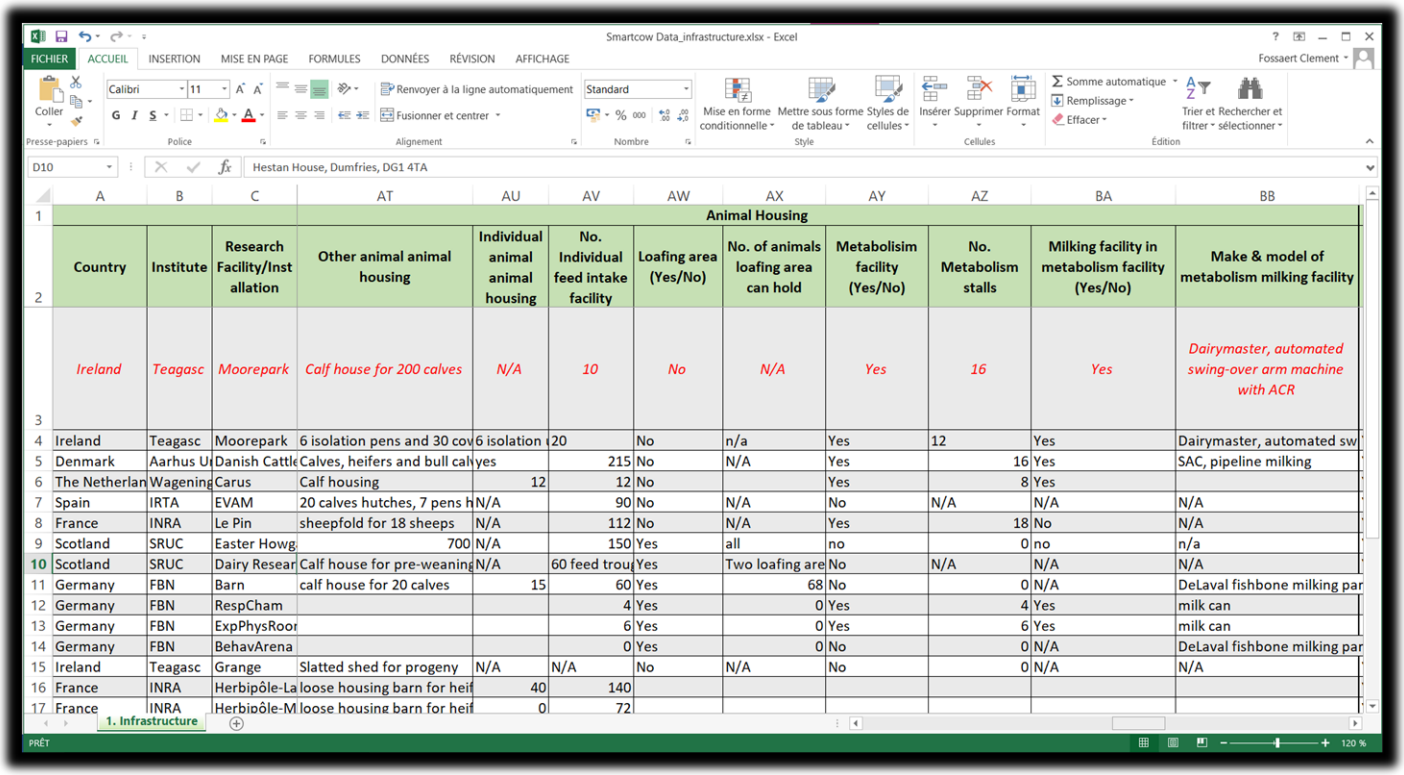


	A	B	C	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN
1				Description of Animals									
2	Country	Institute	Research Facility/Installation	Dairy Cow breed	No. Beef Cows	Beef Cow Breed	No. In-calf heifers	In-calf Heifer breed	No. Steers	Steer breed	No. Bulls	Bull breed	No. Calves
3	*Ireland*	*Teagasc*	*Moorepark*	*Holstein-Friesian and Holstein-Friesian x Jersey*	*0*	*N/A*	*80*	*HF and HFx JEX*	*0*	*N/A*	*12*	*Aberdeen Angus*	*80*
4	Ireland	Teagasc	Moorepark	Holstein-Friesian and H	0	N/A	65	Holstein-Friesia	0	N/A	10	8 x Aberdeen A	70
5	Denmark	Aarhus U	Danish Cattle	Holstein-Friesian and J	0	0	100	HF and Jersey	0	0	0	0	120
6	The Netherlan	Wagening	Carus	Holstein-Friesian	0		5	HF	0		0		5
7	Spain	IRTA	EVAM	Holstein-Friesian	0	N/A	75	Holstein-Friesia	0	N/A	0	N/A	5
8	France	INRA	Le Pin	Holstein, Normande, J	130	Charolaise	370	Holstein, Norma	0	N/A	5	Charolaise	220
9	Scotland	SRUC	Easter Howg	N/A	200	Aax, LimX , Luin	100	Aax, LimX , Luin	350	Aax, LimX , Luin	5	AA,Lim,Luing	280
10	Scotland	SRUC	Dairy Resear	Holstein-Friesian	0	N/A	125	Holstein-Friesia	0	N/A	1	Aberdeen Angu	165
11	Germany	FBN	Barn	Holstein-Friesian	0	N/A	8	HF	0	N/A	0	N/A	6
12	Germany	FBN	RespCham	Holstein-Friesian	0	N/A		HF	0	N/A	0	N/A	
13	Germany	FBN	ExpPhysRoor	Holstein-Friesian	0	N/A		HF	0	N/A	0	N/A	
14	Germany	FBN	BehavArena	Holstein-Friesian	0	N/A		HF	0	N/A	0	N/A	
15	Ireland	Teagasc	Grange	0	240	Limousin, Angu	60	0	120	Charolias and L	0	0	240
16	France	INRA	Herbipôle-La	N/A	170	Charolaise and	60	Charolaise and	15	Angus x Salers	8	Charolais, Saler	170
17	France	INRA	Herbipôle-M	Holstein and Montbeli	0	N/A	60	Holstein and M	0	N/A	0	0	60

Figure 4. List of research institutes and the description of their animals



	A	B	C	AT	AU	AV	AW	AX	AY	AZ	BA	BB
1				Animal Housing								
2	Country	Institute	Research Facility/Installation	Other animal animal housing	Individual animal animal housing	No. Individual feed intake facility	Loafing area (Yes/No)	No. of animals loafing area can hold	Metabolisim facility (Yes/No)	No. Metabolism stalls	Milking facility in metabolism facility (Yes/No)	Make & model of metabolism milking facility
3	*Ireland*	*Teagasc*	*Moorepark*	*Calf house for 200 calves*	*N/A*	*10*	*No*	*N/A*	*Yes*	*16*	*Yes*	*Dairymaster, automated swing-over arm machine with ACR*
4	Ireland	Teagasc	Moorepark	6 isolation pens and 30 cov	6 isolation	20	No	n/a	Yes	12	Yes	Dairymaster, automated sw
5	Denmark	Aarhus U	Danish Cattle	Calves, heifers and bull cal	yes	215	No	N/A	Yes	16	Yes	SAC, pipeline milking
6	The Netherlan	Wagening	Carus	Calf housing	12	12	No		Yes	8	Yes	
7	Spain	IRTA	EVAM	20 calves hutches, 7 pens h	N/A	90	No	N/A	No	N/A	N/A	N/A
8	France	INRA	Le Pin	sheepfold for 18 sheeps	N/A	112	No	N/A	Yes	18	No	N/A
9	Scotland	SRUC	Easter Howg	700	N/A	150	Yes	all	no	0	no	n/a
10	Scotland	SRUC	Dairy Resear	Calf house for pre-weaning	N/A	60 feed trou	Yes	Two loafing are	No	N/A	N/A	N/A
11	Germany	FBN	Barn	calf house for 20 calves	15	60	Yes	68	No	0	N/A	DeLaval fishbone milking par
12	Germany	FBN	RespCham			4	Yes	0	Yes	4	Yes	milk can
13	Germany	FBN	ExpPhysRoor			6	Yes	0	Yes	6	Yes	milk can
14	Germany	FBN	BehavArena			0	Yes	0	No	0	N/A	DeLaval fishbone milking par
15	Ireland	Teagasc	Grange	Slatted shed for progeny	N/A	N/A	No	N/A	No	0	N/A	N/A
16	France	INRA	Herbipôle-La	loose housing barn for heif	40	140						
17	France	INRA	Herbipôle-M	loose housing barn for heif	0	72						

Figure 5. List of research institutes and the description of their animal housing

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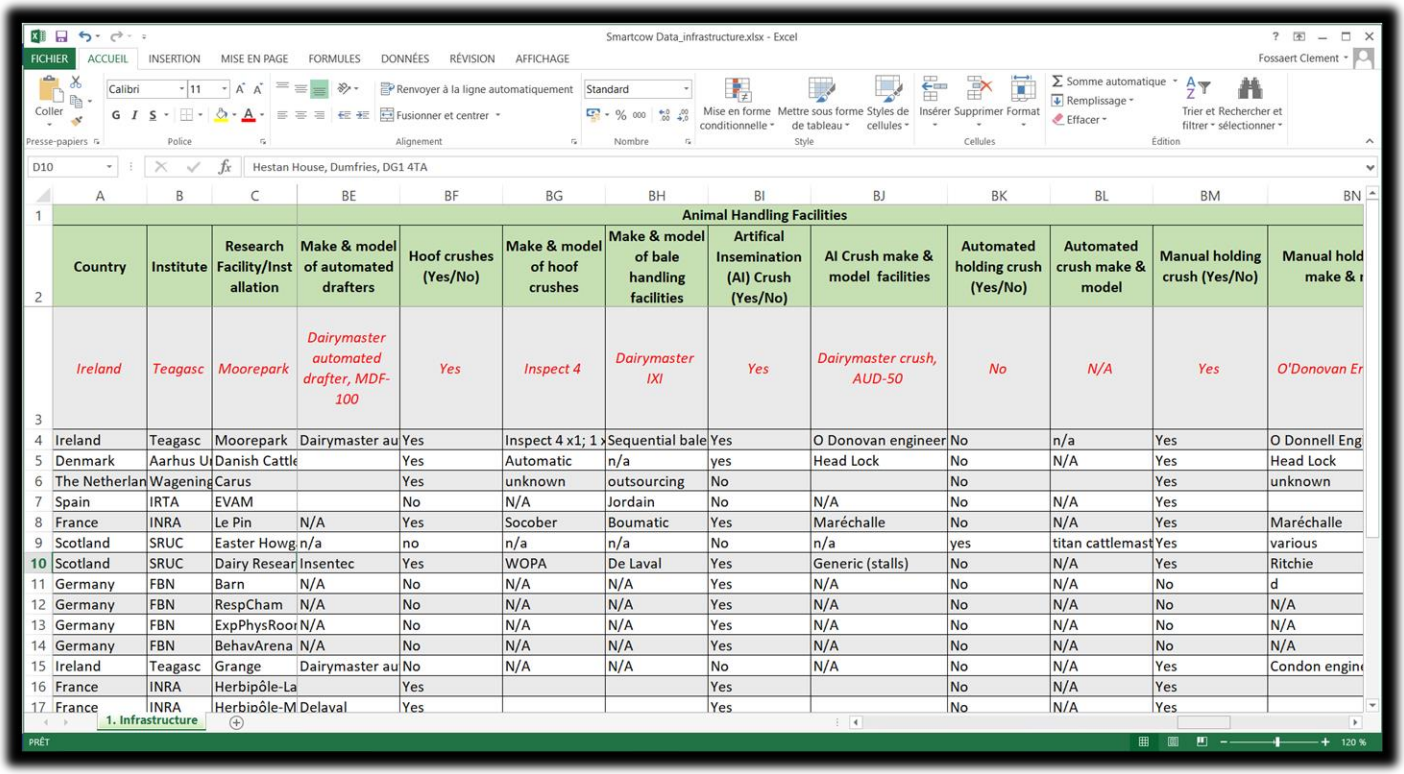
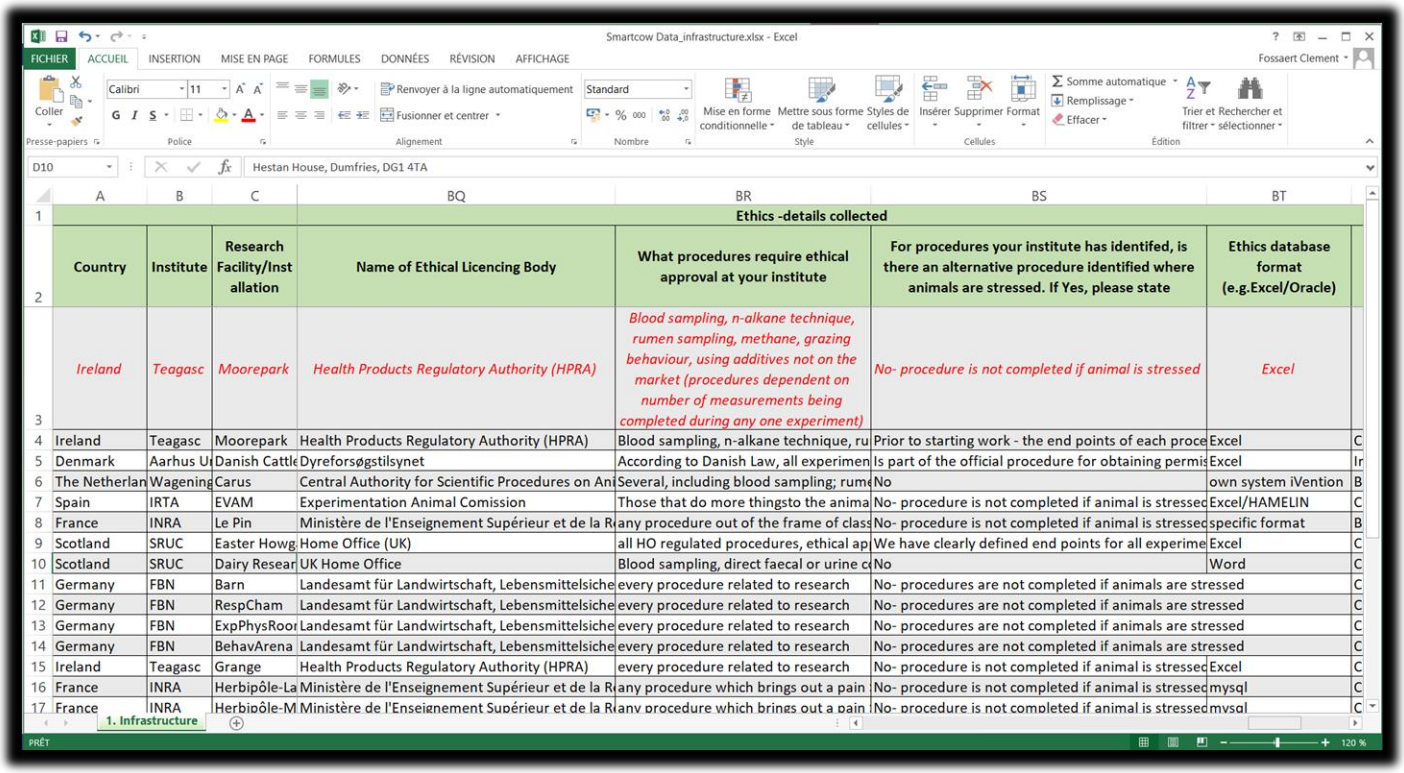


	A	B	C	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN
1				Animal Handling Facilities									
2	Country	Institute	Research Facility/Installation	Make & model of automated drafters	Hoof crushes (Yes/No)	Make & model of hoof crushes	Make & model of bale handling facilities	Artifical Insemination (AI) Crush (Yes/No)	AI Crush make & model facilities	Automated holding crush (Yes/No)	Automated crush make & model	Manual holding crush (Yes/No)	Manual hold make &
3	*Ireland*	*Teagasc*	*Moorepark*	*Dairymaster automated drafter, MDF-100*	*Yes*	*Inspect 4*	*Dairymaster IXI*	*Yes*	*Dairymaster crush, AUD-50*	*No*	*N/A*	*Yes*	*O'Donovan Er*
4	Ireland	Teagasc	Moorepark	Dairymaster au	Yes	Inspect 4 x1; 1 x	Sequential bale	Yes	O Donovan engineer	No	n/a	Yes	O Donnell Eng
5	Denmark	Aarhus Ut	Danish Cattle		Yes	Automatic	n/a	yes	Head Lock	No	N/A	Yes	Head Lock
6	The Netherlan	Wagening	Carus		Yes	unknown	outsourcing	No		No		Yes	unknown
7	Spain	IRTA	EVAM		No	N/A	Jordain	No	N/A	No	N/A	Yes	
8	France	INRA	Le Pin	N/A	Yes	Socober	Boumatic	Yes	Maréchalle	No	N/A	Yes	Maréchalle
9	Scotland	SRUC	Easter Howg	n/a	no	n/a	n/a	No	n/a	yes	titan cattlemast	Yes	various
10	Scotland	SRUC	Dairy Resear	Insentec	Yes	WOPA	De Laval	Yes	Generic (stalls)	No	N/A	Yes	Ritchie
11	Germany	FBN	Barn	N/A	No	N/A	N/A	Yes	N/A	No	N/A	No	d
12	Germany	FBN	RespCham	N/A	No	N/A	N/A	Yes	N/A	No	N/A	No	N/A
13	Germany	FBN	ExpPhysRoor	N/A	No	N/A	N/A	Yes	N/A	No	N/A	No	N/A
14	Germany	FBN	BehavArena	N/A	No	N/A	N/A	Yes	N/A	No	N/A	No	N/A
15	Ireland	Teagasc	Grange	Dairymaster au	No	N/A	N/A	No	N/A	No	N/A	Yes	Condon engin
16	France	INRA	Herbipôle-La		Yes			Yes		No	N/A	Yes	
17	France	INRA	Herbipôle-M	Delaval	Yes			Yes		No	N/A	Yes	

Figure 6. List of research institutes and the description of their animal handling facilities



	A	B	C	BQ	BR	BS	BT
1				Ethics -details collected			
2	Country	Institute	Research Facility/Installation	Name of Ethical Licencing Body	What procedures require ethical approval at your institute	For procedures your institute has identifed, is there an alternative procedure identified where animals are stressed. If Yes, please state	Ethics database format (e.g.Excel/Oracle)
3	*Ireland*	*Teagasc*	*Moorepark*	*Health Products Regulatory Authority (HPRA)*	*Blood sampling, n-alkane technique, rumen sampling, methane, grazing behaviour, using additives not on the market (procedures dependent on number of measurements being completed during any one experiment)*	*No- procedure is not completed if animal is stressed*	*Excel*
4	Ireland	Teagasc	Moorepark	Health Products Regulatory Authority (HPRA)	Blood sampling, n-alkane technique, ru	Prior to starting work - the end points of each proce	Excel
5	Denmark	Aarhus Ut	Danish Cattle	Dyreforsøgstilsynet	According to Danish Law, all experimen	Is part of the official procedure for obtaining permis	Excel
6	The Netherlan	Wagening	Carus	Central Authority for Scientific Procedures on Ani	Several, including blood sampling; rume	No	own system iVention
7	Spain	IRTA	EVAM	Experimentation Animal Comission	Those that do more thingsto the anima	No- procedure is not completed if animal is stressed	Excel/HAMELIN
8	France	INRA	Le Pin	Ministère de l'Enseignement Supérieur et de la R	any procedure out of the frame of class	No- procedure is not completed if animal is stressed	specific format
9	Scotland	SRUC	Easter Howg	Home Office (UK)	all HO regulated procedures, ethical ap	We have clearly defined end points for all experime	Excel
10	Scotland	SRUC	Dairy Resear	UK Home Office	Blood sampling, direct faecal or urine c	No	Word
11	Germany	FBN	Barn	Landesamt für Landwirtschaft, Lebensmittelsiche	every procedure related to research	No- procedures are not completed if animals are stressed	
12	Germany	FBN	RespCham	Landesamt für Landwirtschaft, Lebensmittelsiche	every procedure related to research	No- procedures are not completed if animals are stressed	
13	Germany	FBN	ExpPhysRoor	Landesamt für Landwirtschaft, Lebensmittelsiche	every procedure related to research	No- procedures are not completed if animals are stressed	
14	Germany	FBN	BehavArena	Landesamt für Landwirtschaft, Lebensmittelsiche	every procedure related to research	No- procedures are not completed if animals are stressed	
15	Ireland	Teagasc	Grange	Health Products Regulatory Authority (HPRA)	every procedure related to research	No- procedure is not completed if animal is stressed	Excel
16	France	INRA	Herbipôle-La	Ministère de l'Enseignement Supérieur et de la R	any procedure which brings out a pain	No- procedure is not completed if animal is stressed	mysql
17	France	INRA	Herbipôle-M	Ministère de l'Enseignement Supérieur et de la R	any procedure which brings out a pain	No- procedure is not completed if animal is stressed	mysql

Figure 7. List of research institutes and their ethic procedures

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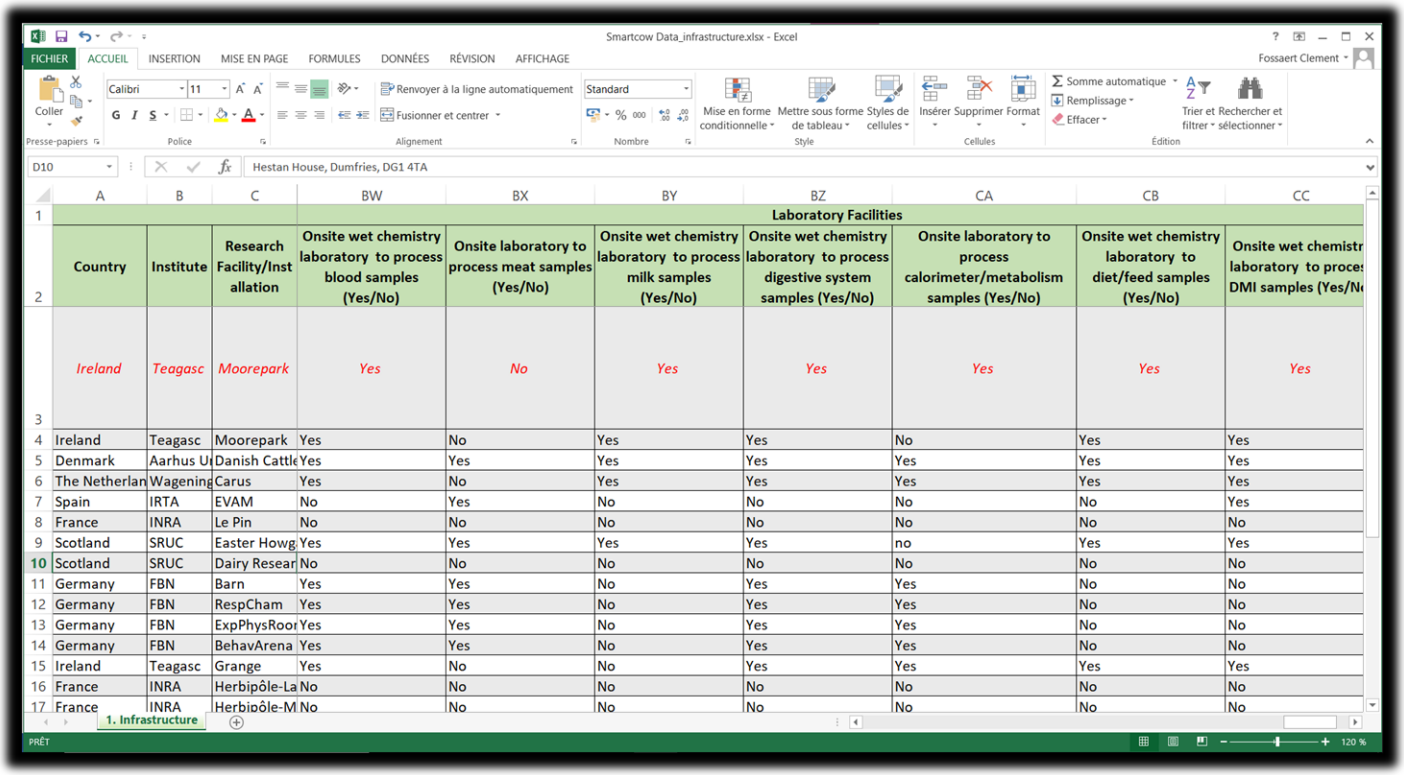

Smartcow Data_infrastructure.xlsx - Excel

D10: Hestan House, Dumfries, DG1 4TA

	A	B	C	BW	BX	BY	BZ	CA	CB	CC
1				Laboratory Facilities						
2	Country	Institute	Research Facility/Installation	Onsite wet chemistry laboratory to process blood samples (Yes/No)	Onsite laboratory to process meat samples (Yes/No)	Onsite wet chemistry laboratory to process milk samples (Yes/No)	Onsite wet chemistry laboratory to process digestive system samples (Yes/No)	Onsite laboratory to process calorimeter/metabolism samples (Yes/No)	Onsite wet chemistry laboratory to diet/feed samples (Yes/No)	Onsite wet chemistr laboratory to proces DMI samples (Yes/N
3	*Ireland*	*Teagasc*	*Moorepark*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
4	Ireland	Teagasc	Moorepark	Yes	No	Yes	Yes	No	Yes	Yes
5	Denmark	Aarhus U	Danish Cattle	Yes	Yes	Yes	Yes	Yes	Yes	Yes
6	The Netherlan	Wagening	Carus	Yes	No	Yes	Yes	Yes	Yes	Yes
7	Spain	IRTA	EVAM	No	Yes	No	No	No	No	Yes
8	France	INRA	Le Pin	No	No	No	No	No	No	No
9	Scotland	SRUC	Easter Howg	Yes	Yes	Yes	Yes	no	Yes	Yes
10	Scotland	SRUC	Dairy Resear	No	No	No	No	No	No	No
11	Germany	FBN	Barn	Yes	Yes	No	Yes	Yes	No	No
12	Germany	FBN	RespCham	Yes	Yes	No	Yes	Yes	No	No
13	Germany	FBN	ExpPhysRoor	Yes	Yes	No	Yes	Yes	No	No
14	Germany	FBN	BehavArena	Yes	Yes	No	Yes	Yes	No	No
15	Ireland	Teagasc	Grange	Yes	No	No	Yes	Yes	Yes	Yes
16	France	INRA	Herbipôle-La	No	No	No	No	No	No	No
17	France	INRA	Herbipôle-M	No	No	No	No	No	No	No

1. Infrastructure

Figure 8. List of research institutes and the description of their laboratory facilities

2 Use of the database

2.1 Creation of an interactive map

In order to portray the information collected, this database will be turned into an interactive map, created in google map form. First, the interactive map will localize and characterize the research infrastructure of each partner. All the infrastructures will be visible on the map with a label, and clicking on an infrastructure's label will give access to information about its localisation and research theme. A link will also lead to more detailed information about the staff, the facilities, the animals and ethic management, if needed. These information will be accessible to everyone.

Then, the mapping focus will extend beyond participating organisations within participating countries and finally to the rest of Europe. The second step will be to collect information about other European infrastructures and to add them to the map.

The aim of this map is to give more visibility to all research infrastructures, giving the possibility to every interested stakeholder to know what is available and where, leading to a better collaboration within European researchers.

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2.2 Use in other work packages of the project

The collected information will also be useful for some other work packages of the project. For instance, one of the objective of the work package 3 is to define common guidelines for research and routine data recording, based on an inventory of experimental protocols and ethical aspects.
The information about the equipment and the ethical aspects catalogued in this database can be a first draft of this inventory.

Moreover, this database and the interactive map created will give to the research infrastructures more visibility and these infrastructures will be more easily identified by European researchers, enabling an effective communication in the WP4.

3 Access to the database

3.1 Access to SmartCow partners

All the project partners can have access to the full database (excel file format) via the internal collaborative platform (a sharepoint).

3.2 General access

For non-partners, most of the information catalogued on the database will be available on the interactive map in the project's website :

- All Institute details (address, responsible person, website…)
- Site characteristics
    - Enterprise (dairy or meat)
    - Climate
    - Total land
    - Grazing land
    - Grazing season
- All Animal types and breeds
- Housing systems
    - Housing facilities
    - Number of individual hosing
    - Individual feed intake facilities (Yes/No)
    - Metabolism facilities (Yes/No)
- Animal handling facilities
    - Holding area (Yes/No)
    - Automated drafters (Yes/No)
    - Hoof crushes (Yes/No)
    - Artificial insemination crush (Yes/No)
    - Auto or manual holding crush
- Laboratory facilities
    - Capacity to process blood sample (Yes/No)
    - Capacity to process meat sample (Yes/No)
    - Capacity to process milk sample (Yes/No)
    - Capacity to process digestive system sample (Yes/No)

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  - Capacity to process calorimeter/metabolism sample (Yes/No)
  - Capacity to process diet/feed sample (Yes/No)
  - Capacity to process DMI sample (Yes/No)
- Ethical aspects
  - Animal Welfare body (Yes/No)
  - Licence to perform experiments (Yes/No)
  - Name of the ethical licence body

If needed, the excel file can be available with the agreement of the person in charge of the infrastructure.
Moreover, following the EU General Data Protection Regulation (GDPR) approved by the EU Parliament on 14 April 2016 and enforced on 25 May 2018, we put in place a procedure in order to protect the data gathered in the database and the exchange of contact details between the person of interest and the project partner. Each party will have to sign a consent form available on the website in which they are allowing the process and exchange of data through the Data Protection Notice linked to the consent form that have to be signed.

4 Extension and updates of the database

In the course of the project, the database and the interactive map will be extended progressively to other research infrastructures on cattle within the institutions and the countries of the SmartCow consortium in a first step. In a second step, the mapping focus will extend beyond participating countries to the wider EU by the means of a questionnaire sent to EAAP international network. This will allow to establish as far as possible the research capabilities of all cattle research centres in the EU and updates of the interactive map (milestones in year 2, 3 and 4 of the project). This will be also the occasion of existing infrastructures to update their data in the database. Beyond the SmartCow project, the database can be reissued in future infrastructure projects.

5 Communication about the database

Some communication will be done concerning this database on the project's website.
The creation of the interactive map based on this database could be the topic of an article on the SmartCow newsletter or on SmartCow facebook account. The work done on the database will also support scientific communication at international conference in animal science.

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