SmartCow

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

Newsletter – Issue 3

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Summary

SmartCow participation in scientific conferences

1. **EAAP 70th annual meeting in Ghent (Belgium), 26th – 30th August 2019**

The main theme of the EAAP's annual meeting this year was "Animal farming for a healthy world", and it dealt with topics such as resource efficiency, animal welfare, diversification, agroecology, climate change and product quality. The program covered various disciplines such as animal genetics, animal health and welfare, animal nutrition, animal physiology, livestock farming systems, cattle, horse, pig, sheep and goat production, precision livestock farming and insects.

SmartCow was highly active during this year's EAAP annual meeting, which was held in Ghent, Belgium. It organized four different initiatives:

- A session (n°43) organized jointly with the Common Dissemination Booster (CDB) Fitter Livestock Farming, "Burning issues in biodiversity 2: fitter livestock farms from better gene banks" (more details in the CDB article below).

- A presentation in session n°36, to present the project's inventory tools,

- A poster in session n°35, to present the first results on the proxies for predicting digestibility and intake in cattle,

- And a booth providing information about the project, organized jointly with EAAP.

- On Wednesday 28th August, during session n° 36, "Beef farming and products towards the future", chaired by Jean-François Hocquette (President of the Cattle Commission of EAAP), SmartCow project lead Dr René Baumont made a presentation on SmartCow: "SmartCow: fostering synergies through mapping cattle research infrastructures and research". The aim was to present to the scientific public the different inventory tools realized by the project, and to encourage researchers to participate in their development. These include: a) the inventory of national and regional cattle infrastructures in Europe, b) the interactive map of

these infrastructures, c) the inventory of research animal databases and existing sample banks, and d) the catalogues of equipment and techniques used throughout Europe, as well as their associated protocols.

- On Wednesday 28th August, during the session n° 45, "Alarm management, individual feed efficiency, data quality and data ownership, decision support systems in PLF", work from the SmartCow Joint Research Activities was presented as Poster n°475: "Faecal-NIRS for predicting digestibility and intake in cattle: efficacy of two calibration strategy" (D. Andueza, et al.).

- The Animal Task Force (ATF) organized session n°13 on Monday 26th August afternoon: "Towards a climate smart European livestock farming" in support of the Common Dissemination Booster's objectives. The session was a step towards the ATF-CDB joint meeting which will held on 6th November (more details below and in the article on the CDB).

- A SmartCow booth was organized jointly with EAAP. The main aims were:

   o To disseminate the information about the calls for proposals,

   o To encourage researchers to participate in the survey for the inventory of research infrastructures,

   o To disseminate the catalogue of training among young researchers,

   o To encourage interested participants to become stakeholders.

2. ICAR annual conference in Prague (Czech Republic), 17th – 21st June 2019

SmartCow has also participated in the International Committeee for Animal Recording (ICAR) Annual Conference 2019, in Prague, Czech Republic, from 17th to 21st June 2019. During the Technical Session n°1 Part 1 chaired by Andrew Cromie and Eric Venot: "New Traits & Developments in beef cattle breeding", René Baumont made a presentation: "SmartCow: A project aimed at improving phenotyping capacity across cattle research infrastructures in Europe", which was followed by a discussion with the participants.

3. ISRP in Leipzig (Germany), 3rd – 6th September 2019

Finally, SmartCow participated in the International Symposium on Ruminant Physiology (ISRP) conference in Leipzig from 3rd to 6th September. This conference occurs every five year with participation by researchers in Ruminant Physiology from all parts of the world. René Baumont gave a presentation on SmartCow in the session "Biosensors and big data management". It was the occasion to highlight the first achievements and the main ongoing activities of the project: The mapping of research infrastructures; the elaboration of the book of methods in cattle physiology; the ring-test on gas recovery in methane chambers; the establishment of databases for the studies of proxies of feed efficiency and its determinants; and the guidelines for validation of sensor output for cattle behaviour.

4. Next meeting

A joint session organized by the Common Dissemination Booster, in cooperation with ATF (Animal Task Force), and EAAP in Brussels, 6th November 2019: "What Research Infrastructures can deliver to support climate mitigation and adaptation in livestock farming". René Baumont will present on SmartCow. For the six projects taking part in the CDB, the aim of this meeting is to focus jointly on the stakeholders (see a more detailed analysis of this workshop in the article on CDB in this Newsletter: "SmartCow's involvement in the CDB, Common Dissemination Booster "Fitter Livestock Farming").

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SmartCow's involvement in the CDB "Fitter Livestock Farming"

Smartcow participates with five other EU-funded projects (Feed-a-Gene, Image, Saphir, GplusE, GenTORE) in the CDB Fitter Livestock Farming[1], a joint tool created by the European Commission, with its financial support, and coordinated by Trust IT-Services[2]. These six projects are closely related to each other, with similar objectives. The idea is to help them collaborating, developing synergies, and to organize both:

- A pooling of the common developments, through a cooperation on the projects' outcomes

- A pooling of the stakeholders (helping them not to divide their attention between different similar initiatives)

This involves both the organization of cooperation events (exchange of expertise) and of joint communication events (dissemination of the common outcomes).

The involvement in this activity has resulted in both: new kinds of events and new dissemination tools.
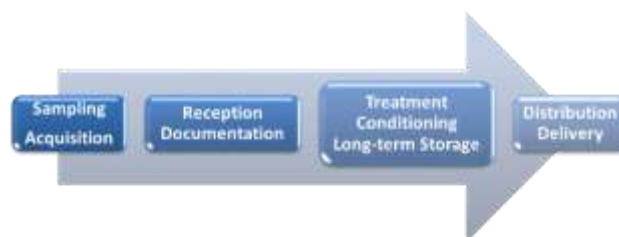
1. **Joint events**

A joint CDB session was organized during the EAAP annual meeting (28th August 2019) in Ghent, session n°43: "Burning issues in biodiversity 2: fitter livestock farms from better gene banks". The Chair was Michèle Tixier-Boichard coordinator of IMAGE. René Baumont has made a presentation for Smartcow: "Integrating European cattle research infrastructures to improve their phenotyping offer". The purpose of this joint session was to foster synergies between the projects on their common goal of facilitating the use of genetic resources through the standardization of languages, protocols, procedures and methods. In conclusion, Michèle Tixier-Boichard summarized the four different levels at which the cooperation should develop between the six different projects

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[1] The contractual name of this joint booster is CDB GenTORE, since it was created at first under the initiative of Nicolas Friggens, coordinator of GenTORE.

[2] Trust-IT is an SME specialised in market & technical research analyses in the field of ICT. It designs and implements digital marketing and communication strategies and commercial initiatives for research and innovation actions worldwide

within the CDB. They correspond to the different steps of the creation of a gene bank. At each step the main objectives of cooperation can be synthesized as follows:

> Step 1: Sampling/Acquisition: the focus should be on sampling protocols (how to store the samples from EU projects securely?). Which objectives when choosing the samples: Preservation of diversity? How to preserve reference samples?
>
> Step 2: Reception/Documentation: the focus should be to inform and document the open data from EU projects with animals having samples in gene banks. Helping to localize and identify them (animal common identifier). How to guide users to relevant data?
>
> Step 3: Treatment/Conditioning/Storage: the focus should be on quality control, safety, traceability and re-usability.
>
> Step 4: Distribution/Delivery: The focus should be on the criteria operating in the agreements: access and benefit sharing, decreasing the number of animals in experiments, time series analysis, and new phenotypes.

A second joint session will be organized in Brussels, on 6th November 2019 (afternoon) as part of the in collaborative emeeting between the CDB, ATF (Animal Task Force) and EAAP: "**What Research and Innovation can deliver to support climate mitigation and adaptation in livestock farming**". The aim of this session is to concentrate dissemination on a shared (between the six projects) and consensual (for the public opinion) objective, by a pooling of stakeholders, in order to help them not divide their attention between the projects. Other new events will be organized by the CDB in 2020 and 2021.

2. Joint tools

In order to implement these events, several tools have been created and can be used and disseminated by the project partners to help advertise the activities of SmartCow within the CDB. They have been developed with the help of Trust IT-Services, and for the moment, the following have been produced:

- Three tweets announcing the events
- Tools developing the content on the CDB: a flyer, a roll-up, and an article[3].
- A beautiful video has been produced to help announce the meeting on 6th November.

Conclusion

So far, the experience of the CBD seems positive and fruitful, and the expertise of the start-up IT-Services in the field of communication has been useful for the entire consortium.

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[3] The tools and the video are available on the SmartCow website.

**Participate to SmartCow survey!**

SmartCow has set out among its first priorities and outcomes in cattle research to give a harmonized description of European facilities. SmartCow wants to establish an inventory of all existing cattle research infrastructures across Europe, so it has set on its website an interactive map of these infrastructures, allowing web users to get all the available information about each infrastructure. We have already begun to develop this map which you can consult at the following link.

Currently, the only Research Installations (RIs) mentioned on the map are those of the project partners and your contribution will be very important for the network we are building.

We have prepared a questionnaire; whose objective is to survey all the existing cattle RIs in Europe. We invite you to complete the survey here. This could be a great opportunity to give more visibility to your RI and develop new opportunities for cooperation with other existing RIs.

For any question or information concerning this survey, please contact: **Pauline Madrange**, Institut de l'Elevage, Pauline.Madrange@idele.fr Tel : +33 (0)4 43 76 06 86, or +33 (0)4 73 62 42 77

**SmartCow Transnational Access: Second Call underway**

**Free access to the leading European cattle research facilities**

The Transnational Access (TNA) programme of SmartCow makes available cattle research facilities of SmartCow partners for research by academic or industry colleagues from other (mainly EU) countries. There are 18 research installations in seven countries, covering a range of cattle types managed in diverse husbandry and feeding systems. They include the most advanced animal science technologies applied to cattle in the fields of nutrition, physiology, ethology and animal husbandry. Successful bidders will receive funding to cover the operating costs of facilities, but not their own costs.

The second call for proposals was launched in April 2019. Pre-proposals received by the deadline of 30th June 2019 have been assessed for eligibility under the scheme rules and applicants invited to submit Full Proposals by 30th September 2019. We have adopted a two-stage application process with initial short pre-proposals allowing us to check eligibility of project teams and availability of facilities before teams add more detail about the proposed work at the full proposal stage. Full proposals will only be accepted by invitation from those who submitted pre-proposals. We have moved to using an Online Submission tool to ease the processes of submitting and reviewing Pre-proposal and Full Proposals.

We expect to launch the next call for TNA in April 2020 – this will be the final call as SmartCow runs from 2018 until 2022.

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A special section of the SmartCow web site provides more detail about the TNA call:

- Rules regarding the operation of the scheme and selection of projects
- Data Protection Notice for the processing of personal data
- Descriptions of facilities available for TNA projects
- Priority research areas

The SmartCow Access Management Team is available to provide advice on any aspect of the scheme; please contact them by email (smartcow-tna@inra.fr forwards to them all) or individually:
- Richard Dewhurst (Richard.Dewhurst@sruc.ac.uk) – Transnational Access leader
- René Baumont (rene.baumont@inra.fr) - SmartCow Coordinator
- Lene Munksgaard (Lene.Munksgaard@anis.au.dk)

TNA experiment at INRA Herbipôle

The experimental work within the TNA SmartCow project « From grassland biodiversity and grass conservation to the animal's, microbial ecosystem, and to milk and cheese quality » started in the beginning of May 2019 at the INRA Herbipôle facility in Marcenat and lasted until the end of July 2019. During three months, fifteen people including researchers, technicians and students from Switzerland, Italy, and France participated in the field work. As a provisional result, the cellars of the Joint Research Unit for Cheese Research are full of ripening experimental cheeses that will be analyzed soon.

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SmartCow Training Program!

Interested in feed efficiency of cattle and methane emissions? Join the SmartCow training program!

The 2 courses planned on October in France and Germany are full, but it is still possible to register to the 5 Webconferences (also in October 2019), dealing with topics such as feed efficiency of beef and dairy cattle and methane emissions.
For more information and registration, please visit the SmartCow website

 Study Tour at Inra Theix (France), 3rd October

On the occasion of the French Sommet de l'Elevage, Europe's n°1 livestock show, 2nd to 4th October, take the opportunity to visit an INRA centre. INRA (French National Institute for Agricultural Research) is Europe's foremost Institute for agronomic research, and the second largest at a global level. We will welcome you to the heart of the Herbipôle structure, a research site wholly dedicated to the rearing of herbivorous farm animals in mountain areas, with an ensemble of infrastructures adapted to new research questions, notably the sustainability of livestock-rearing systems.
For more information and registration, please visit the SmartCow website

Validation of sensor

Nowadays in cattle research infrastructures, a large amount of data is recorded using new smart technologies on a routine basis or for experimental purposes. This mirrors the increasing application of 'Precision Livestock Farming' technologies on farm. However, there is a lack of a common approach for validation of such devices. Thus, the SmartCow consortium proposes guidelines for validation of sensor output that highlights a checklist to consider before conducting a study to validate a sensor for measuring cattle behaviour.

Read the interesting document!

For more information visit our website: www.smartcow.eu

Twitter: @cow_smart - Facebook: @smartcowproject