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

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

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SmartCow

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EXECUTIVE SUMMARY

Background	Each project partner was invited to send a description of the training course or study-tour on offer and these descriptions were collated into a catalogue. For study tours, the program is designed to visit the best-equipped facilities in the consortium and to discuss with scientists on recent measurement techniques and scientific results. For training courses, a diversified program ranging from teaching scientific basics, recent research results, state-of-the-art analytical techniques and for face-to-face trainings, hands-on-training in the lab was tailored to attract specifically young scientists.
Objectives	The study tour and training program aim at transferring and ensuring sustainability of the knowledge generated by the project and fostering innovation by the means of online, face-to-face courses and study tours targeting very specific and specialised actors, in particular the next generation of scientists in cattle breeding.
Methods	We used the following method: • Designing a study tour and training program, • Disseminating this program among the scientists and stakeholders, using the networks of the SmartCow partners and existing media, • Managing the enrolment of the candidates, • Organizing the study tours and courses.

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Results & implications	5 training courses were planned and were finally successfully organized as webinars: "Validation and use of sensor outputs", 22nd Apr 2020 "Ethics in experiments on animals", 22nd-23rd September 2020, "Ontologies in Smartcow", 15-16th December 2020 "Biomarkers assisted-predictions of feed efficiency and their main determinants in cattle", 26-th November 2021 "Introduction to Infrared spectroscopy tools to investigate fermentation parameters", dispensed by CRA-W, 23rd November 2021 As a result of Covid, several training programs originally organised to be in-person had to be changed to webinars. This meant rethinking the program, in particular in the even to of practical exercises. But actually, this enabled a far wider audience to be reached than that of in person training courses. In general, the participants fell within the target range of Bachelors, Masters and PhD students, researchers, scientists and stakeholders, depending on the training course. Most of them came from European countries, and some of them from countries in the rest of the world. However, the 2 study tours planned in the DAO (one at Danish Cattle Research Centre (Denmark) early 2021, and one early 2022 in Ireland) were cancelled due to the Covid pandemic.

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1 The 2020-2021 study tour program

According to the DOA, 2 study tours were initially scheduled in 2020-2021:

- one at Danish Cattle Research Centre (Denmark) early 2021. It was finally decided that this study tour could take place in September 2021, alongside the project's Annual Meeting.
- one early 2022 in Ireland

Over a period of one or two days, it should have consisted of:

• A general presentation of the SmartCow program and its potential benefits for stakeholders

• Visits of research installations

• Indoor presentations by researchers, with discussion sessions

The idea is to organise these study tours alongside the project's Annual Meeting, to enable the partners to take part, while opening up participation widely to stakeholders and researchers, etc, from various European countries, well beyond the project partners.
However, due to the pandemic situation, the September Annual Meeting planned in Germany had to be replaced by a digital meeting. Thus the study tour had to be cancelled.

Given the pandemic and all the ensuing difficulties involving travel and organising events such as these, we had to cancel also the study tour which should have taken place in Ireland in early 2022.

The unspent budget was allocated to the funding of an additional TNA project at AU.

2 The 2020-2021 training program

2.1 Preparation and dissemination of the training program

The general catalogue of SmartCow training courses was created by Idele on the basis of propositions by each training course organising partner. Then the catalogue was published from the start of the project on the SmartCow website, via social media and by emailing to the project's various partners. Then, a few months before each training course, a new communication campaign was carried out to prompt enrolments.
Idele managed the enrolment of the participants, coordinated the organization with the trainers, and provided the webinar platform and technical assistance for the trainers and the participants.

The program of the courses, as well as some of the training materials, can be downloaded from the SmartCow website:
https://www.smartcow.eu/resources/training/

2.2 Validation and use of sensor outputs, 22nd Apr 2020

Initially designed as a face-to-face course, the course had to be changed to a webinar due to the Covid situation. The initial program had to be revisited taking this constraint into account. In the end, the program included 2 hours of presentations in the morning, followed by a practical case study carried out by each participant during the lunch break, and then once again 2 hours online with all participants. The presenters were Lene

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Munksgaard and Guiherme Amorin Franci from Arrhus University. More than 80 participants followed this webinar, most of them from European countries.

2.3 Ethics in experiments on animals, 22-23rd Sept 2020

Put forward by the INRAE, this training course was also initially scheduled to take place in person, but as a result of Covid, it had to be converted into an online training course, shortly before the course began.
The program addressed the following topics:

- Balancing issues
- The 3Rs approach
- Welfare, stress, pain, cut-off points
- Adjustment of animal numbers in experimentation
- Refinement of experimental conditions
- Alternatives to experiments

The speakers were 8 INRAE scientists, placed under the coordination of Isabelle Veissier.
Practical exercises included the evaluation of 3 protocols. Twelve trainees attended the e-learning, from Spain (5), France (3), Hungary (2), Bulgaria (1) and UK (1). At the end of the training, they expressed a high degree of satisfaction.

2.4 Ontologies in SmartCow, 15-16 Dec 2020

This training course, put forward by INRAE, was also scheduled to take place in person, and was changed to a webinar on account of Covid.
The program, which took place over 3 half-days, addressed the following topics:

- What is an ontology?
- The ontology engineering lifecycle and its best practices
- Presentation of French ontologies from INRAE, example of application/use of an ontology, text based annotation with ontologies,

The speakers were O. Dameron from University of Rennes 1, M. Solanki from Agrimetrics, J. Bugeon, M.C. Salaün, C. Nédellec and C. Hurtaud from INRAE.
32 people were present at least one part of the webinar. They were from France (14), Germany (5), Greece (3), Hungary (2), UK (2), Ireland, Spain, Finland, Switzerland, China and Austria.
Some participants were interested in a more applied suite to make the best use of ontologies.

2.5 Introduction to Infrared spectroscopy tools developed in SmartCow, 23th Nov 2021

This 2-hour long webinar was dispensed by Vincent Baeten, Clément Grelet and Amélie Vanlierde, under the coordination of Frédéric Dehareng, from CRA-W.

The program included a presentation of infrared spectroscopy, development of prediction models and key factors affecting the quality, and selected examples developed in SmartCow project. 28 people participated in this webinar, from Western European countries (68%), Eastern European countries (10%), Latin America (4%), Africa (4%) and Asia (4%).

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2.6 Biomarkers assisted-predictions of feed efficiency and their main determinants in cattle, 26th Nov 2021

This webinar, lasting 2 x 1h30 was presented by Gonzalo Cantalapiedra and Donato Andueza of the INRAE, under the coordination of Cécile Martin from INRAE. The program addressed the following points:

- Biomarkers to predict feed efficiency in beef and dairy cattle

Potential of fecal NIR spectra to predict total tract digestibility and enteric methane emissions in cattle

52 people took part in this webinar, from Western European countries (58%), Eastern European countries (16%), Latin America (16%), Africa (6%) and Asia (4%).

General note regarding gender of participants

When registering for training, participants did not have to enter their gender as this personal data is not necessary to the execution of the training. Therefore, it is not possible to provide precise statistics on this subject. However, according to the first names of the trainees, it seems that we have close to male-female parity participation during these training sessions.

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