



Sensor Devices Task Force (SD-TF) Summary & Status Report

Steven J. Sievert, National DHIA, USA, Martin Burke ICAR, Clément Allain, Institut de l'Elevage, France, Franz Josef Auer, Landeskontrollverband Tirol, Austria, Cecilia Bågenvik, DeLaval, Sweden, Kees De Koning, Animal Sciences Group Wageningen UR, The Netherlands, Christa Egger-Danner, ZuchtData EDV-Dienstleistungen GmbH, Austria, Uffe Lauritsen, Danish Agricultural Advisory Service, Denmark, Reinhard Reents, VIT, IT, Germany, Jeroen van den Ban, Lely International N.V., The Netherlands, Harrie van den Bijgaart, Qlip B.V., The Netherlands, Brian Wickham, ICAR

The Sensor Devices Task Force (SD-TF), as outlined in the Terms of Reference, is charged with providing leadership and direction to ICAR and its members with respect to the usability of data generated by these devices and guidelines for validation or certification of sensor devices. The SD-TF focused on properties, protocols and data structure of sensor devices/systems so to provide various ICAR SC and WG with working tools to develop specific tools for development of specific device measurement standards moving forward.

In the table below, there is a summary of progress made and deliverables complete. There are specific actions that will require follow-up by the ICAR Recording and Sampling Devices Subcommittee (RSD-SC). Further, using the data structure standards, respective ICAR SC and WG have tools to develop specific standards for accuracy, repeatability, and reproducibility as well as define the data measurement(s) such as number of milkings, number of days, or other descriptive term(s) as needed.

Objective	Deliverable Status	Work to be completed
SD Landing page and resources	SD-TF has created a landing page on the ICAR website for dissemination of information.	Ongoing updates from the RSD-SC and other ICAR SC/WG.
SD Survey	SD-TF completed and published a survey of members, experts and interested parties/data users.	
Outreach to Industry Partners/Research Organisations Working on Sensors	SD-TF included members of the 4D4F project team and has created links to access the 4D4F warehouse directory of sensors	
SD Summary Table of Devices	SD-TF has compiled and published a summary of SD and trait measurements/method provided by the device/system. This summary is available on the SD landing page on the ICAR website.	Ongoing maintenance by RSD-SC including addition of new devices/systems and incorporation of performance criteria from manufacturers.
SD Reference Table of Validation Criteria	SD-TF has compiled and published a reference table of trait characterization and validation criteria including gold standard(s) for measurements where applicable. This table is an internal reference for respective SC and WG.	Ongoing maintenance of table by ICAR including addition of new measurements as defined.
New Section (number to be determined) for addition to ICAR Guidelines	SD-TF has draft language for a new section to add to the ICAR Guidelines that will provide an overview of data collection challenges and standards when using SD. These challenges include affirmative animal ID, data	ICAR Staff to prepare proposed new section to ICAR Guidelines and then follow normal adoption process involving ICAR Board, feedback and ultimate affirmation by General Assembly.



	connectivity, data handling/editing and other data quality factors.	
Standard Specification for Data Usability for each Measurement/Trait	SD-TF has developed a specification for each measurement (or trait) where data originates from devices/systems. This includes data use, measurement principle, scheme(s), data expression, accuracy, repeatability, and reproducibility for various schemes, and includes other associated data points such as animal ID, DIM, etc.	Incorporation of the specification into the new section of the ICAR guidelines and distribution to ICAR SC/WG for adoption in development of specific performance criteria for respective traits.
Guidelines for Testing of Sensor Devices and/or Systems	SD-TF has drafted new guidelines for testing sensor devices and/or systems for incorporation into Section 11 of the ICAR Guidelines. (With emphasis on developing test plans based on the application and more of a system than device testing basis)	The ICAR RSD-SC is rewriting all of Section 11 of the ICAR Guidelines. This revision has a target of November 2019 for completion. The draft then goes to ICAR Board for endorsement followed by vote by General Assembly.
Universal Coding System for RSD & SD	SD-TF has asked Interbull to be the lead to develop and maintain a universal coding system for existing RSD and new SD	Interbull to develop specification and protocol for coding system and disseminate information to MRO and database managers.

Recommendations from the SD-TF;

Since its formation in 2016 the Sensor Task Force has completed the initial project deliverables (above) but others, like the guidelines and development of performance standards have yet to be completed. As these outstanding tasks and work plan have been identified by the SD-TF, it is now recommended:

- a. Conclude the work of the Sensor TF as of June 2019, noting that all Task Forces have a set lifetime and defined scope of work,
- b. The execution of these outstanding tasks be placed under the remit of ICAR's Recording & Sampling Devices SC to coordinate their completion, with support from ICAR staff and other Sub Committees and Working Groups as required,
- c. ICAR Board to set direction with respect to the appropriate level of ICAR certification, approval, verification, validation, categorisation or other terminology for data and the sensor devices or systems that generate these data.

Steven Sievert /Martin Burke / Uffe Lauritsen 06th June 2019