



THE GLOBAL STANDARD  
FOR LIVESTOCK DATA

# **Procedure 9 of Section 11 of ICAR Guidelines - Evaluation of Installation and Routine Calibration Procedures for Sensor Systems**

Section 11 – Evaluation of Installation and Routine Calibration Procedures for Sensor Systems

Version March 2023

**Network. Guidelines. Certification.**

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## Change Summary

Date of Change	Nature of Change
March 2023	Creation of separate Procedure.
July 2023	Approved by General Assembly and published.

## 1 Introduction

Sensor system validation is the final stage of the ICAR testing and validation process for sensor systems as illustrated in [Procedure 1](#) of Section 11 of the ICAR Guidelines. ICAR-validated sensor systems have demonstrated through ICAR testing that the system delivers data for the purpose and as described in the test report and the manufacturer of the system meets the conditions for validation outlined in Section 11 of the ICAR Guidelines.

When a new or modified sensor system is to be submitted for an ICAR validation test, the test applicant must provide to ICAR several documents as described in [Procedure 1](#). Among these documents are the system installation and system routine calibration or periodic checking procedures. These procedures will be evaluated as part of the sensor system validation test.

As an alternative to the routine calibration or periodic checking procedure for the sensor system, a computerized solution for monitoring the sensor system may be considered. Computerized solutions and procedures are described in [Procedure 10](#) of Section 11.

## 2 Installation test

After installing the sensor system, whether in a parlour or other area of the livestock operation, the performance of the system must be tested by means of an installation test when applicable. This test is carried out in agreement with the member organization and/or in collaboration with the technician of the manufacturer or an authorized dealer. The manufacturer or the dealer is responsible for the installation, calibration and testing of the system before the acceptance test is carried out.

The installation test procedure shall include:

- Instructions for performing the installation test.
- Components of the sensor system included in the installation test (i.e. sensor, controller, connection, interface)
- Software version, where applicable
- Limits for the test or pass/fail criteria

An installation test for a sensor system, depending on the requirements for calibration testing for the parameter(s), will be evaluated as part the ICAR test of the sensor system using the procedure provided by the manufacturer. If the sensor system provides milk yield estimates (or if milk yield estimates are one of multiple parameters in the system test application), then the specific procedures for the installation test found in [Procedure 6](#) of Section 11 will be referenced in the test.

Note: For those systems that have a milk weight component to the parameter(s) measured; platform scales, balance beams and spring scales used as reference during installation and routine calibration tests must be of adequate range of weighing and must be calibrated at the beginning of a test. The accuracy of platform scales, balance beams and spring scales should be at least within 0.02 kg.

For sensor systems providing estimates of parameters other than milk yields, the installation test consists of the procedure provided by the manufacturer and evaluated during the ICAR test of the system.

Only when results of the installation test are within the described limits for the test, the system may be used.

### 3 Routine calibration test

A routine calibration (or periodic checking) procedure to test the system must be carried out annually, at a minimum, in the field. The method for testing has to be provided by the manufacturer as part of the test application ([Procedure 1](#) of Section 11). The validity and reproducibility of the routine calibration procedure for the sensor system will be tested during the field test.

Routine calibration tests for ICAR-validated systems will be made available for ICAR members. In the case that the routine calibration procedure is modified from the original procedure evaluated during the ICAR test of the sensor system, the modified procedure must be reviewed by ICAR. This review may be a desk review or modified test based on the modifications described in the application by the manufacturer.

*Details on the application for testing of modified systems may be found in [Procedure 1](#) of Section 11.*

#### 3.1 Routine calibration tests of on-farm installed sensor systems

The routine calibration test must be carried out at least once every 365 days due to maintenance reasons and in accordance with the manufacturer's requirements. The routine calibration test also includes check on accuracy of the system based on the parameter(s) described in the test application and for the purpose of the data use.

Different procedures may be followed to do the routine procedure regarding the accuracy of the system:

- a. If the manufacturer's routine calibration test or periodic checking procedure prescribes an interval shorter than once every 365 days, the timing of the routine procedure shall follow the manufacturer's instructions.
- b. The sensor component of a system may be tested according the routine procedure for calibration testing provided by the manufacturer and reviewed during the ICAR test of the sensor system.
- c. In case of a sensor system that includes a milk analyser, the accuracy for analysing fat and protein content shall be part of the routine calibration procedure at a minimum.
- d. An electronic or computerized system may be subjected to an automatic check of errors as part of a recording program (this procedure can be given by a manufacturer, member organization or third-party farm management software suppliers). The procedure must be reviewed and validated by ICAR as detailed in [Procedure 10](#) of Section 11. This procedure is not a substitute for routine maintenance procedures as described by the manufacturer.
- e. In the case of systems providing estimates of parameters that are measured by a single sensor in the system, the installation test must follow the routine calibration or periodic check procedure provided by the manufacturer and evaluated during the ICAR test of the system.
- f. The manufacturer shall identify critical components of the sensor system, should they exist, and that may impact the routine calibration test or periodic checking procedure.