Milking Test at Dairy Farm
for ORION MMD500 milk meter

DETERMINE CALIBRATION VALUE

DETERMINE REFERENCE VALUE

Determine calibration value

STEP 1.

1. Check the current calibration value of each MMD500 milk meter and record it as the initial calibration value prior to the milking test.
2. Collect the milk into the milk bucket via milk meter.
3. Measure the collected milk by a calibrated electronic scale and the measured value is defined as the Reference.
4. Record the observation with the MMD500 display reading and the Reference and then calculate the difference between them using the next formula.

$$\text{Difference}(\%) = \frac{\text{Milk Meter reading(kg)} - \text{Reference from the scale (kg)}}{\text{Reference from the scale (kg)}} \times 100$$

5. Take minimal 3 readings per a milk meter and calculate the differences (if the three readings not differ more or less equally it is advised to take more readings).
6. If the average difference is less than or equal to 3% and the average difference of all the milk meters on the farm is less than or equal to 2%, the current calibration of the milk meters are correct. (*)
   No further observations are necessary.
   It is recommended to determine calibration around ZERO (between -1 and +1%).
7. If the difference can not meet the above mentioned judgment condition, the milk meter (s) involved must be recalibrated and assessed according to STEP 2 and STEP 3.

(*) ICAR guideline / Chapter 11.6.1.1.(ver.2012):
The calibration of the milk meter is considered correct if the average difference is less than or equal to 150 % of the limits for bias (2%) according to table11.2 and the average difference of all the devices on the farm shall be less than or equal to 100% of the limits for bias according to the table 11.2.

STEP 2.

1. If the difference is exceeding the judgment condition, the milk meters involved must be recalibrated according to the following procedure.

   <u>Recalibration Example:</u>
   If the Initial calibration value is – 2 and the average difference is – 5%:
   – 1 x – 5 = 5
   – 2 + 5 = **3**

Result: The corrected recalibration value is **3**.
Input the new value into the milk meter.

2. Record 3 new readings per the recalibrated milk meter and calculate and evaluate the result in the same manner described in STEP 1.
3. If the difference is out of the judgment condition, perform STEP 3.

STEP 3.

1. The milk meter(s) which is failed in STEP 2, 3 more readings must be done and the average difference of six readings will be calculated.
2. The calibration of the milk meter is considered correct if the average difference is less than or equal to 3%.
3. If not, the milk meter is not acceptable and readjustment, repair or replacement has to be done by the manufacturer, after which the above procedure has to be repeated.

Determine Reference Value

1. When meters are installed or replaced or when repairs influence the measurement, the meters are to be tested during the milking, after which the testing procedure with the water test should be carried out twice.
2. The average of the two measurements will then serve as "reference value".
3. When proceeding to periodic checking, the reference values are handed over for support.
   This report includes:
   - Farm information
   - Meter and/or serial #
   - Vacuum level during determine reference value
   - Calibration value
   - Reference value
4. The explanation how to fulfill the water test is described in the document “Periodic Checking Method” with special attention to properly cleaned milk meters, required equipment, test liquid and the principle of the test.

Example (use of ORION “Reference Value Recording Sheet” is recommended):

MMD500 No. / serial #	**Calibration value**	**Reading of Display [kg]**	**Measuring value [kg]**	**Difference [kg]**	**Reference value (average of 2 differences) [kg]**
12345	**-2**	10.0	10.32	-0.32	**-0.34**
		10.0	10.36	-0.36	
06789	**0**	10.2	10.38	-0.18	**-0.17**
		10.2	10.36	-0.16	
Remark: Own readings and differences can differ from above due to control board and calibration value.					

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