

Standard Operating Procedure

Calibration of Roff Micro Doser with VFD

1. Purpose

To ensure the Micro Doser delivers micronutrient premix within $\pm 2\%$ of the target addition rate during maize-meal fortification.

2. Scope

This SOP applies to all Micro Doser units installed in Roff maize-meal milling plants.

3. Responsibilities

Quality Assurance (QA) Technicians are responsible for performing and documenting calibration. Maintenance staff assist with mechanical adjustments.

4. Equipment & Materials

- Calibrated digital scale (± 0.1 g resolution)
- Clean collection container (≥ 2 kg capacity)
- Stopwatch or timer
- Test medium (coarse salt or vitamin premix)
- Personal protective equipment (PPE)

5. Safety Precautions

Ensure the doser is isolated from the main power supply before mechanical adjustments. Wear dust masks and eye protection when handling premix.

6. Calibration Procedure

6.1 Preparation

- Verify the hopper is clean and empty.
- Fill hopper with test medium.
- Confirm maize-meal throughput is stable at the nominal rate (e.g., 2 t/h).

6.2 Static Calibration (Salt-Bucket Test)

- Place the collection container on the scale and tare.
- Run the Micro Doser for exactly 60 s while collecting discharge.
- Weigh the sample and record the mass (g).
- Calculate actual dosage:
$$\text{Actual mg/kg} = (\text{Collected mass (g)} \times 1000) / (\text{Throughput (kg/min)})$$
- Adjust VFD screw speed to correct any deviation $> \pm 2\%$.

6.3 Dynamic Verification

- a) Resume normal production.
- b) After 15 min, collect a composite product sample.
- c) Perform rapid tests for iron and vitamin A; record results in the Hourly QC Log.

6.4 Documentation

Record all calibration data, adjustments and signatures in the Calibration Record section of the Hourly QC Log.

7. Calibration Frequency

- At daily start-up.
- After any maintenance on the doser or VFD.
- Whenever product throughput changes by > 20 %.
- At least once per production week.

8. References

- Roff Micro Doser with VFD – Operations Manual
- National Food Fortification Regulations
- HACCP Plan (Fortification CCPs)

9. Revision History

Rev 1.0 – 12 June 2025 – Initial issue.