

Calibration of Portable Scales

2024 Meter & Scale Technician Training School

Steven Sievert

Manager, Quality Certification Services Inc.

Technical Director, National DHIA

Chair, ICAR Subcommittee for Measuring, Recording and Sampling Devices

Scale Calibration Requirements



- All scales must be calibrated at least once every 12 months
- Calibrated to:
 - 2% accuracy on single weight
 - 3% accuracy on two consecutive weights
- Data is reported to QCS as part of annual field service audit

Scale Calibration Requirements

Portable Scale Calibration Readings (Imperial - Pounds)

Reference Weight	Calibrate 1X	Calibrate 2X	Repair or Remove
			42 5.0%
			52 4.0%
			41.9 4.8%
			51.9 3.8%
			41.8 4.5%
			51.8 3.6%
			41.7 4.3%
			51.7 3.4%
			31.7 5.7%
			41.6 4.0%
			51.6 3.2%
			31.6 5.3%
			41.5 3.8%
			51.5 3.0%
			31.5 5.0%
			41.4 3.5%
			51.4 2.8%
			31.4 4.7%
			41.3 3.3%
			51.3 2.6%
			31.3 4.3%
			41.2 3.0%
			51.2 2.4%
			31.2 6.0%
			41.1 2.8%
			51.1 2.2%
			31.1 3.7%
			41.1 2.8%
			51.1 2.2%
			21.3 6.5%
			31.3 4.3%
			41.3 3.3%
			51.3 2.6%
			21.2 6.0%
			31.2 4.0%
			41.2 3.0%
			51.2 2.4%
			21.1 5.5%
			31.1 3.7%
			41.1 2.8%
			51.1 2.2%
			11 10.0%
			21 5.0%
			31 3.3%
			41 2.5%
			51 2.0%
			10.9 9.0%
			20.9 4.5%
			30.9 3.0%
			40.9 2.3%
			50.9 1.8%
			10.8 8.0%
			20.8 4.0%
			30.8 2.7%
			40.8 2.0%
			50.8 1.6%
			10.7 7.0%
			20.7 3.5%
			30.7 2.3%
			40.7 1.8%
			50.7 1.4%
			5.7 14.0%
			10.6 6.0%
			20.6 3.0%
			30.6 2.0%
			40.6 1.5%
			50.6 1.2%
			5.6 12.0%
			10.5 5.0%
			20.5 2.5%
			30.5 1.7%
			40.5 1.3%
			50.5 1.0%
			1.5 50.0%
			2.5 25.0%
			5.5 10.0%
			10.5 5.0%
			20.5 2.5%
			30.5 1.7%
			40.5 1.3%
			50.5 1.0%
			1.4 40.0%
			2.4 20.0%
			5.4 8.0%
			10.4 4.0%
			20.4 2.0%
			30.4 1.3%
			40.4 1.0%
			50.4 0.8%
			1.3 30.0%
			2.3 15.0%
			5.3 6.0%
			10.3 3.0%
			20.3 1.5%
			30.3 1.0%
			40.3 0.8%
			50.3 0.6%
			1.2 20.0%
			2.2 10.0%
			5.2 4.0%
			10.2 2.0%
			20.2 1.0%
			30.2 0.7%
			40.2 0.5%
			50.2 0.4%
			1.1 10.0%
			2.1 5.0%
			5.1 2.0%
			10.1 1.0%
			20.1 0.5%
			30.1 0.3%
			40.1 0.2%
			50.1 0.2%
			1.0 0.0%
			2.0 0%
			5.0 0%
			10.0 0%
			20.0 0%
			30.0 0%
			40.0 0%
			50.0 0%
			0.9 -10.0%
			1.9 -5.0%
			4.9 -2.0%
			9.9 -1.0%
			19.9 -0.5%
			29.9 -0.3%
			39.9 -0.3%
			49.9 -0.2%
			0.8 -20.0%
			1.8 -10.0%
			4.8 -4.0%
			9.8 -2.0%
			19.8 -1.0%
			29.8 -0.7%
			39.8 -0.5%
			49.8 -0.4%
			0.7 -30.0%
			1.7 -15.0%
			4.7 -6.0%
			9.7 -3.0%
			19.7 -1.5%
			29.7 -1.0%
			39.7 -0.8%
			49.7 -0.6%
			0.6 -40.0%
			1.6 -20.0%
			4.6 -8.0%
			9.6 -4.0%
			19.6 -2.0%
			29.6 -1.3%
			39.6 -1.0%
			49.6 -0.8%
			0.5 -50.0%
			1.5 -25.0%
			4.5 -10.0%
			9.5 -5.0%
			19.5 -2.5%
			29.5 -1.7%
			39.5 -1.3%
			49.5 -1.0%
			4.4 -12.0%
			9.4 -6.0%
			19.4 -3.0%
			29.4 -2.0%
			39.4 -1.5%
			49.4 -1.2%
			4.3 -14.0%
			9.3 -7.0%
			19.3 -3.5%
			29.3 -2.3%
			39.3 -1.8%
			49.3 -1.4%
			9.2 -8.0%
			19.2 -4.0%
			29.2 -2.7%
			39.2 -2.0%
			49.2 -1.6%
			9.1 -9.0%
			19.1 -4.5%
			29.1 -3.0%
			39.1 -2.3%
			49.1 -1.8%
			9 -10.0%
			19 -5.0%
			29 -3.3%
			39 -2.5%
			49 -2.0%
			18.9 -5.5%
			28.9 -3.7%
			38.9 -2.8%
			48.9 -2.2%
			18.8 -6.0%
			28.8 -4.0%
			38.8 -3.0%
			48.8 -2.4%
			18.7 -6.5%
			28.7 -4.3%
			38.7 -3.3%
			48.7 -2.6%
			28.6 -4.7%
			38.6 -3.5%
			48.6 -2.8%
			28.5 -5.0%
			38.5 -3.8%
			48.5 -3.0%
			28.4 -5.3%
			38.4 -4.0%
			48.4 -3.2%
			28.3 -5.4%
			38.3 -4.3%
			48.3 -3.4%
			28.2 -4.5%
			38.2 -4.5%
			48.2 -3.6%
			28.1 -4.8%
			38.1 -4.8%
			48.1 -3.8%

- Must calibrate at each of the following weights...

- Dairy Cows

- 10, 20, 30, 40, 50 lbs.

- Dairy Goats/Sheep

- 1, 2, 5, 10, 20 lbs.

- Refer to chart in MTTTS Manual for acceptable weight readings

Scale Calibration Requirements



- Every scale must have unique serial number
- Each scale must be marked with calibration tag/sticker
 - Month & Year
 - Meter Center Used
 - Meter/Scale Technician

Reporting Scale Calibration Results to QCS

Scale no	FT	Make	Model	2013 Date	2014 Date	Int	MC	MT	1#	2#	5#	10#	20#	30#	40#	50#	2015 Status	2016 Status
174434	999	AWS	PK-110	7/7/2016	9/12/2016	67	Meter Center Name	Meter Tech Name	1	2	5	10.1	20.1	30.2	40.4	50.4		New 2016

- Proper reporting improves audit efficiency
 - Unique serial number – avoid alphanumeric values
 - Make and model of scale
 - Calibration date(s)
 - Meter center and technician name
 - Calibration weights at each level
 - Status during the audit period

Reporting Scale Calibration Results to QCS

- Suggested Status Codes for Scale Calibration Worksheets
 - Active
 - New (+ year) – scale new from the box
 - Return (+ year) – repaired scale or returned to active status
 - Storage – calibrated scale not in active use (backup)
 - Out (+ year) – scale taken out of service
 - Perm Out or POS – broken scale that cannot be repaired
 - Goat – scale that has only been calibrated for goats

Reporting Scale Calibration Results to Producer

DHIA Goat Milk Scale Calibration Record

DATE: _____ Scale owner & herd name: _____

Scale make and model number: _____ Scale ID number: _____

digital? Y / N on milk test? Y / N Name of DHIA: _____

Calibration readings:

1.0 _____

comments: _____

2.0 _____

5.0 _____

10.0 _____

20.0 _____

Passed Y / N

Technician: _____

SCALES SUITABLE FOR DHI PROGRAMS

Hanson Dairy Scale 600



- The old 'standard' for DHI milk weighing
- No longer manufactured
- Can reface the scale with new label – contact auditor
- Maintains calibration over the weight range

Chatillon MD-60



- Designed specifically for dairy applications
- Easy to read
- Heavy gauge steel construction, baked enamel finish
- Expensive purchase price but durable
- Easy to calibrate

Detecto MCS-60M



- Designed specifically for dairy applications
- Accurate weighing at all levels
- Combination plastic and steel
- Expensive purchase price but durable
- Easy to calibrate

Pelouze (Viking) 7800 and 7842



- Low-cost scale
- Metal construction, baked enamel finish
- Moderately durable, can lose calibration easy
- **Does not like travel**
- Marketed by some dairy supply places as replacement for the Hanson scale

Salter Brecknell 235-Series



- Medium cost point
- Metal construction, baked enamel finish
- Moderately durable

Taylor 3460 and 3470



- Low-cost scale
- Combination plastic and thin steel
- NOT durable and loses calibration easy
- Does not like to travel
- Treat as disposable scale to send unsupervised/owner-sampler herds

American Weigh Scales: PK - SR Series



- Digital scale with low purchase price
- PK – 110 (110 lb. capacity)
- SR – 20 (44 lb. capacity)
- Easy to carry in computer bag
- Accurate but not legal for trade
- Can be calibrated
- Modern image for DHI providing accurate results

Kingon Hanging Scale



- Digital scale with low purchase price
- 110 lb. capacity
- Easy to carry in computer bag
- Accurate but not legal for trade
- Can be calibrated
- Modern image for DHI providing accurate results

Dr. Meter ES-PS01/FS-01



- Digital scale with low purchase price
- 110 lb. capacity
- Easy to carry in computer bag
- Accurate but not legal for trade
- Can be calibrated
- Modern image for DHI providing accurate results

EtekCity EHS-18



- Digital scale with low purchase price
- 110 lb. capacity
- Easy to carry in computer bag
- Accurate but not legal for trade
- Can be calibrated
- Modern image for DHI providing accurate results

Intelligent Weighing Technology AHS-60



- Digital scale with high purchase price
- 60 lb. capacity. 0.05 lb. increments
- Larger size scale, carrying case available.
- Uses 4 C batteries or AC adapter
- NTEP certified, NIST certificate available and legal for trade
- Can be easily calibrated