

STANDARD OPERATING PROCEDURES
DIVISION OF COMPARATIVE MEDICINE
UNIVERSITY OF SOUTH FLORIDA

SOP#: 1019.1

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TITLE: **Certification of Scales and Balances**
SCOPE: This procedure describes USF Comparative Medicine's (CM) method for certifying scales and balances.
RESPONSIBILITY: Facility Manager, Assigned Program Personnel
PURPOSE: To outline the procedure for monitoring the accuracy of the scales and balances used in CM.

I. PURPOSE

1. To ensure that weighing equipment used in animal facilities for the generation,

alue), on at least 30 m
certification.

Check the scale in a c
be stabilized to the sa

Test weights should b

storage place after use. **Test weights will only be handled with appropriate tools such as tweezers, forks, handles or gloves.**

The weighing instrument should be at a horizontal level. There may be a bubble-level to use to ensure it is level by adjusting the feet.

Perform a few pre-tests by placing weights within the range on the instrument to ensure it works normally.

2. Eccentricity test

In normal use of a weighing instrument the load is not always placed perfectly on the center of the load receptor. Sometimes the results of a weighing instrument can vary slightly depending if the load is placed in different locations on the load receptor. In order to test how much effect the location of the load has, the eccentricity test is performed.

In the eccentricity test, the reference load is placed in a few different specified locations on the load receptor. First, the load is placed in the center of the load receptor (the load's center of gravity) and the result is observed. Next, the load is placed in four different sectors of the load receptor, as illustrated in the picture below.

The test load used in an eccentricity test **should be within the range** of the weighing instrument and preferably using just one test load. That way it is easier to be sure that the load's center of gravity is in the specified location. For a weighing instrument with multiple ranges, the eccentricity test should be done with the highest range.

It is important to use the same load through the test.

Procedure for the eccentricity test

The indication is zeroed before the test. The test load is placed to location 1 and indication is recorded. The test load is then moved to locations

load is placed again to location 1 to check that the indication has not drifted from the earlier indication in location.

The zero may be checked between each location to see that it has not changed. If necessary, the instrument can be zeroed in between each test.

Alternatively, you may also tare the instrument when the load is in location number 1, as

- Read the stable value from the display and note it
- Remove the test weight
- Repeat the measurements from 'tare the balance to 'remove test weight" 3 times
- Record the values on **CMDC #262 Weight Scale Certification Record Sheet**.

4. Weighing test

The purpose of the weighing test is to test the accuracy of the weighing instrument within its range in several steps, with increasing and decreasing weight.

Five different loads (test points) will be used. The loads used should be within the load range of the instrument. The smallest test load can be 10% of the maximum load, or the smallest weight normally used.

The most common practice is the following:

- Start with zeroing the instrument without any load.
- Set the loads of the first test point, wait for stabilization, and **record the indication**.
- Continue increasing the loads through all the increasing test points.
- Once the maximum load is recorded, start decreasing the loads through the decreasing test points.

Generally, the test points are selected so that they are equally distributed throughout the range. More test points can be used for the typical range of usage of the instrument.

Scale Accuracy: The scale is accurate to 2% for each weight. See example table below:

Weight	Scale Requirement	Calibration Reading
100g	100g	99.8g
200g	200g	199.6g
300g	300g	299.4g
400g	400g	399.2g
500g	500g	499.0g
600g	600g	598.8g
700g	700g	698.6g
800g	800g	798.4g
900g	900g	898.2g
1000g	1000g	998.0g
900g	900g	898.2g
800g	800g	798.4g
700g	700g	698.6g
600g	600g	598.8g
500g	500g	499.0g
400g	400g	399.2g
300g	300g	299.4g
200g	200g	199.6g
100g	100g	99.8g

If any of the test fail, report the problem to the manager/supervisor and mark the instrument "out of control limits".

Approved:

Date: