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## **Inspecting and Testing Electronic Carcass Evaluation Devices**

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This is the first in a series of articles intended to familiarize field officials with the standards for and the operation, inspection, and testing of electronic carcass evaluation devices. Since the 2006 edition of NIST Handbook 44 will include a new tentative code Section 5.59. Electronic Livestock, Meat, and Poultry Evaluation Systems and/or Devices-Tentative Code, it is important that field officials begin evaluating these devices to determine if any changes are need to the tentative code.

There are four documentary standards that are applicable to electronic carcass evaluation devices during inspection and testing in the field. The first is NIST Handbook 44 Section 5.59. Electronic Livestock, Meat, and Poultry Evaluation Systems and/or Devices-Tentative Code, the primary documentary standard to be used by weights and measures officials. It provides the legal basis for field inspections and for testing of the devices when the jurisdiction adopts the current edition of Handbook 44 into its law or regulation. In addition to Section 5.59., three ASTM documentary standards apply and are referenced in Section 5.59: (1) ASTM Standard F2341 - 03 Standard Practice for User Requirements for Livestock, Meat, and Poultry Evaluation Devices or Systems; (2) ASTM Standard F2342 - 03 Design and Construction of Composition or Quality Constituent Measuring Devices or Systems; and (3) ASTM Standard F 2343 - 04 Standard Test Method for Livestock, Meat, and Poultry Evaluation Devices. The ASTM Standards which are referenced in Section 5.59. are voluntary standards that provide the basis for some of the requirements in Handbook 44 Section 5.59.

Like other Handbook 44 codes, Section 5.59. is divided into Subsections addressing device application, Specifications, Test Notes, Tolerances, and User Requirements. The Application paragraphs state that this code is applicable to electronic devices or systems for measuring the composition or quality constituents of live animals, livestock and poultry carcasses, and individual cuts of meat or a combination thereof for the purpose of determining value. It further states that the code is not applicable to scales used to weigh live animals, livestock and poultry carcasses, and individual cuts of meat unless the scales are part of an integrated system designed to measure composition or quality constituents. Scales used in integrated systems must also meet NIST Handbook 44 Section 2.20. requirements.

The Specifications subsection cites ASTM Standard F2342 Standard Specification for Design and Construction of Composition or Quality Constituent Measuring Devices or Systems, which provides design and construction requirements for device manufacturers.

The Notes subsection cites ASTM Standard F 2343 Test Method for Livestock, Meat, and Poultry Evaluation Devices and provides addition guidance for weights and measures

officials for inplant testing of the applicable devices. Paragraph N.3.1. Official Tests encourages officials to periodically witness "in-house" tests which are required on a daily basis, using the appropriate reference standards device owners are required to have on site.

The paragraphs in the Tolerance Subsection and table provide the tolerances for devices that are currently being used for commercial purposes by the meat packing industries. Additional tolerances may need to be added for other types of devices or measurements if packers begin using the measurement of other constituents, such as "pH", in the determination of carcass value.

The paragraphs in the User Requirement subsection require that all devices and systems shall be installed in accordance with manufacturer's instructions. Devices and systems are also required to be maintained in an accurate condition and in accordance with the manufacturer's instructions and ASTM Standard F 2341 Standard Practice for User Requirements for Livestock, Meat, and Poultry Evaluation Devices or Systems. Probably the most important paragraph of the entire code for weights and measures officials is UR.4. Testing Standards. This paragraph requires the user of a commercial device to make available to the official with statutory authority over the device testing standards that meet the tolerance expressed in Fundamental Considerations, paragraph 3.2. (i.e., one-third of the smallest tolerance applied). The accuracy of the testing standards shall be verified annually or, for those states that have a policy for re-verification based on a history for each standard, at a frequency as required by the jurisdiction with statutory authority. The device user is also responsible for providing documentation of the required verification, which shows traceability to a national standard.

The ASTM F10 Subcommittee responsible for F 2341 recently began developing language to be included in that Standard to require the manufacturer of a livestock, meat, or poultry evaluation device or system to provide the required testing standards at the time of installation. After installation, the user of the device will still be responsible for properly maintaining the testing standards.

Before weights and measures officials begin testing or witnessing the testing of these systems, it would be important for them to have some training on the testing criteria for the devices. The NIST Weights and Measures Division (WMD) and the Packers and Stockyard Program (PSP) of the United States Department of Agriculture (USDA) have begun to develop material for presentation at some of the Regional Weights and Measures Association meetings. This material is intended to provide an overview of various systems currently in use by the packing industry. The presentations will also introduce the official to testing criteria and procedures for these systems. WMD and PSP have also agreed to work together on the development of a training program for presentation on a regional basis for jurisdictions that would like to participate.

Subsequent articles in this series will provide information on several different technologies currently being used commercially for making measurements that are used to determine the value of harvested animals by the meat packing industry. They will

provide information on how the various technologies operate and how they are used, as well as inspection and testing procedures for each type of device or system.

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