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Devices Used to Measure Fat Content in Animal Carcasses

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Prior to the NCWM 2000 Annual Meeting, the Grain Inspection, Packers, and Stockyards Administration (GIPSA) branch of the U.S. Department of Agriculture (USDA) approached NIST and the NCWM to discuss the development of standards for devices used to measure fat content in animal carcasses. The NCWM, NIST, and GIPSA began discussing possible approaches and the appropriate forum for the development of these standards.

At the 85th NCWM held in Richmond, VA, GIPSA gave a presentation to the attendees on the practice of measuring the back fat of hog carcasses in meat packing plants. This type of fat measurement is used to adjust the price paid to the producer based on the fat-to-lean ratio of a carcass. A premium price may be paid for carcasses with less fat, or a lower price may be paid for carcasses with a higher fat content. The fat-to-lean ratio is a determinate in what percentage of the carcass the packer is able to deliver to the marketplace as normal meat products. The term "yield grade" is a classification of carcasses based on the fat to lean ratio. GIPSA reported the value of the hogs slaughtered in the United States in 1998 at 8.7 billion dollars. GIPSA anticipates that the same devices may soon be used in the beef packing industry. The value of beef in the United States slaughtered in 1998 was 25.1 billion.

There are several different technologies in use by various instrument manufacturers today. The original "Fat-O-Meater" is an optical instrument that uses the difference in the opaqueness (opacity) of fat and muscle tissue to measure and compute the fat-to-lean ratio. This device is the most common in use today. Other technologies include ultrasonic units, magnetic resonance imaging (MRI) instruments, and a vision system. The ultrasonic units use sound waves to measure the difference in the amount of fat and lean. The MRI instruments operate similarly to MRI instruments used in health care facilities. The vision system, which is the latest technology, uses video cameras and a computer program to determine the amount of fat in a carcass.

On August 31, 2000, representatives from OWM met with James R. Baker, Administrator of the GIPSA branch of the USDA, and members of his staff. This meeting was a follow-up to the GIPSA presentation at the Annual Meeting of the NCWM and the subsequent meeting with the NCWM Board of Directors. At the meeting, Henry Oppermann, Chief, NIST OWM, expressed a concern that the scope of the project may exceed the resources of the NCWM and/or OWM. Other standards-writing organizations may be a potential source of assistance. The NCWM and OWM may want to be involved in the process but not be the responsible party for the development of a standard. Considering the commercial implications of use of these devices, the NCWM may at some future time wish to consider adoption of NIST Handbook 44 requirements relative to specifications, tolerances, and user requirements for the instruments.

At the January 2001 NCWM Interim Meeting, OWM reported that ASTM was interested in being the standards writing organization for the development of the fat measurement standard. GIPSA and the NCWM Board of Directors agreed to pursue that avenue.

On February 6, a meeting was held at ASTM headquarters in Conshohocken, PA, with representatives from ASTM, NCWM, GIPSA, and NIST. At that meeting, ASTM agreed to develop standards for the measurement of fat in animal carcasses with participation by NCWM, GIPSA, NIST, device manufacturers, user groups, and other interested parties. A meeting to begin organizing the effort has been tentatively scheduled for the first week in April 2001. For further information regarding this issue or to be added to the list of interested parties, contact Dick Suiter (NIST) by e-mail at rsuiter@nist.gov or by phone at (301) 975-4406.