

WI-Department of Natural Resources

The Dairy Mercury Manometer Replacement Project

The objective of the dairy Mercury Manometer replacement project in “America’s Dairyland “ is to replace these mercury filled devices with a non-mercury gauge on as many dairy farms as funding will cover. As of June 1, 2004, 526 manometers have been removed from dairy farms, 448 were removed from operating farms and the rest were removed from farms that are no longer milking cows. These 508 manometers contained approximately 405 pounds of mercury. All the collected mercury and manometer devices were picked up at the dealer's place of business and were transported by a licensed hazardous waste hauler to a mercury processor. An \$80,000 grant from the Great Lakes National Program Office (GLNPO) provided the initial funding. After the initial grant was spent the Great Lakes Protection Fund started to provide funding but this source of funding can only be used for farmers in counties that drain into the Great Lakes. The current status is that the project has been terminated in the counties outside the Great Lakes drainage basin and currently only farmers in the Great Lakes drainage basin counties are eligible.

This is a significant project because Wisconsin has approximately 17,000 operating dairy farms that milk cows two or three times a day. Each of these dairy cow milking systems require a vacuum pump and pipeline to remove and transport milk from the cow's udder to a bulk tank. The vacuum pump also powers the milking machine that massages the cow’s teats to stimulate and remove an even flow of milk. The vacuum pressure (about 12 inches of mercury) is very important to the optimum operation of the milking process and must be accurately measured. Milk removed from the cow is sucked to the milk cooling tank by the vacuum pump.

A small percentage of Wisconsin's dairy farmers have chosen to measure vacuum pressure with an accuracy and reliable mercury filled U-tube about 30 inches long containing about 12 ounces of mercury. One end of the tube is connected directly to the milking pipeline by a vacuum hose. The other end of the U tube is open to the atmosphere so that when the pump is running the farmer reads the height difference between the two columns of mercury. Today there are mechanical gages, some with digital readout, that provide a suitable substitute for these mercury filled tubes. The challenge of the project was to provide a satisfactory incentive for removal of the mercury filled tubes, and then convince the dairy farmer to give up the device, which has an established satisfactory performance record.

The success of the project was due to the formation of partnerships with other state agencies and the private business sector, which has more credibility with the farmer than a regulatory agency. The cooperation of the private business sector was vital to convince the dairy farmer that the mercury manometer on their milking system could be replaced by an accurate and reliable non-mercury vacuum gauge.

We first sought technical support from a University of Wisconsin professor, who is an expert on milking equipment and was familiar with replacement gauges, and agreed to set up a meeting

with dairy equipment service providers. The University of Wisconsin Extension county agriculture agents were briefed on the project and distributed our brochures and helped to publicize the project.

We received help from the Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP) inspectors who check the sanitation on each dairy farm twice a year. They noted on their inspection form, the number of farms that still use mercury manometers: at the start of 2004 there were approximately 100 still being used. By coordinating with DATCP's agriculture clean sweep project, so that the hazardous waste contractor also picked up mercury manometers from the participating dairy equipment service providers when they were in the area, we were able to significantly reduce costs and save money.

The farmer's regular dairy equipment service provider performs the important task of removing the mercury manometers and correctly installing and calibrating a new gauge. These are the people that are most familiar with their customer's milking equipment, have some experience with handling mercury and should know what kind of replacement gauge would work best. The incentive to the farmer is that they will get a reimbursement of \$200.00 for a replacement gauge and their milkhouse will be mercury free. The dealers charge the farmer the regular retail cost of the gauge plus labor for installation, thus giving the dealers a profit motive to promote the replacement. There is no need for DNR to get involved in gauge and installation cost because competition, and the dealer's long-term relationship with their customer, assure a fair price.

The dairy business in Wisconsin is changing and although the total number of cows is not changing significantly, many smaller farmers are leaving the business as more large farms are expanding. When a farmer goes out of the milking business a manometer maybe abandoned and a replacement gauge is not needed. In this situations a dealer will receive \$100.00 to find, remove and handle an abandoned manometer that could be spilled into the environment.

An important part of the mercury manometer replacement project was to manage the activities performed by the private sector so that the mercury was handled in a safe manner and to maintain accountability for the money spent. Most manometers have two open tubes sealed with plastic plugs and it was feared that the momentum of the heavy mercury would blow out these plugs while in transit. Most dealers preferred to empty the mercury from the manometer into a sealed jar at the farm. Each of the 36 participating dealers were sent instructions for a safe transfer and a kit which included bottles, a bottle holder, a transfer pan and spill kit with a surface collection pan, absorbent sponges and an absorbent powder. The dealer transported the mercury and empty manometers back to the dealer's place of business where they were picked up by a licensed hazardous waste hauler and transported to a mercury processor.

Financial accountability was achieved by requiring the dealers to fill in and sign an official numbered certificate for each farm, which also required the farmer's signature. Payment was made to the dealer upon receipt and verification of the certificate by the program manager. As each numbered certificate was sent to a dealer the information was entered into a database. The name and address and county of each farmer served are recorded to ensure strict adherence to the grant restrictions on which counties the money could be spent.

The key to the success of the project was the grant money that provided an incentive to the farmer to replace their mercury manometer. A profit motive provided the incentive for the dealers to seek out dairy farmers and convince them that they could install a reliable non-mercury gauge. Partnerships with the University of Wisconsin and DATCP provided credibility, information about which farms had manometers and saved money on collection cost.

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