

MONITORING CATTLE SPERM STORAGE TEMPERATURE FOR ARTIFICIAL FERTILIZATION

CRYOPRESERVATION OF SPERM ENSURED DURING TRANSPORT



A farmer breeding cattle was using artificial insemination methods to ensure optimum fertility and herd quality while avoiding the cost of keeping or borrowing a stock bull. Using this approach, all resources were devoted to the successful fertilization of the breeding cow. To guarantee high fertility rates, the farmer needed to keep the bull semen stored, transported, and ready for implant at the necessary sperm storage temperature.

If storage over 4 days was required, the semen was kept and transported in special containers filled with liquid nitrogen that needed to remain at a constant temperature of -196°C (-320°F). For successful artificial fertilization to occur, the deep-frozen semen needed to be thawed prior to implantation and maintained at 25°C (77°F) for a maximum of around 2 days. In the occasional event of a container leak, nitrogen escaped in gas form and failed to maintain the deep-freeze temperatures without showing any visual indication of the problem. In this case, the semen would be rendered infertile, but the farmer would implant the semen anyway without knowing that this was the case. As a result, his breeding cows failed to fall pregnant, and the farmer fed his livestock without the expected outcome and financial reward.

The farmer could not afford to run the risk of receiving infertile semen, so it was

important for him to carefully control the sperm storage temperature. For storing deep-frozen semen, it was most effective to monitor the nitrogen level in container. Therefore, the customer needed a device featuring a probe suitable for liquid nitrogen temperatures, high accuracy readings, customizable alarm capabilities, and user-friendly software for easy data download.

INSTALLATION

The farmer installed a [SwiTrace IPMT8.CRYO](#) multi-use ultra-low temperature data logger on the liquid nitrogen storage container. The stainless-steel tip of the external sensor was inserted into the container at a depth to match the nominal level of the liquid nitrogen. The logger itself was placed in a small plastic enclosure with a clear lid to allow easy viewing. In the event of a nitrogen leak, as the nitrogen level dropped below the the sensor, the IPMT8 would immediately register a dramatic rise in temperature.

The IPMT8 supported many features which allowed the farmer to make decisions immediately, including a clear LCD display and active & alarm LEDs, incorporating multi-function viewing to see real-time data. The data logger also listed the highest, lowest, and average temperature recorded and offered customizable alarm settings and programmable start function, so the farmer was able to assess immediately if semen viability had been jeopardized by a leaking container. Whenever seeing any indications of a problem, the farmer downloaded a PDF report with a full temperature profile to determine both the time and extent of any temperature rise. This evidence helped the farmer to obtain financial compensation from his insurance company.



USAGE

The temperature logger's 0.01°C (.018°F) external sensor resolution provided an effective early warning system. The IPMT8 also recorded temperatures that thawed or fresh semen had been exposed to, and the farmer could choose to configure the data logger in either Celsius or Fahrenheit. The real-time clock, which the temperature data was recorded against, helped to keep track of the time the semen had been stored between thawing/retrieval and insemination. Logger memory stored up to 8,000 samples.

Free [iPlug Manager software](#) was provided with the IPMT8 for easy programming and the PDF download feature allowed convenient retrieval of recorded data. This user-friendly, intuitive software enabled the farmer to quickly customize the data logger.

BENEFITS

The farmer benefitted in several ways from installing the IPMT8 temperature data logger in the semen storage container. The farm experienced an increased fertility in its livestock due to the temperature logger's high-accuracy readings, which in turn led to savings in feed and labor costs. The inexpensive IPMT8 provided the farmer with the technological solution he needed to introduce total quality control for the temperature-sensitive semen and fertilization process so key to the farm's success.

For more information on [SwiTrace data loggers](#), or to find the ideal solution for your application-specific needs, contact a CAS DataLogger Application Specialist at **(800) 956-4437** or www.DataLoggerInc.com.