

Low cost sensors keeping farm vaccines effective

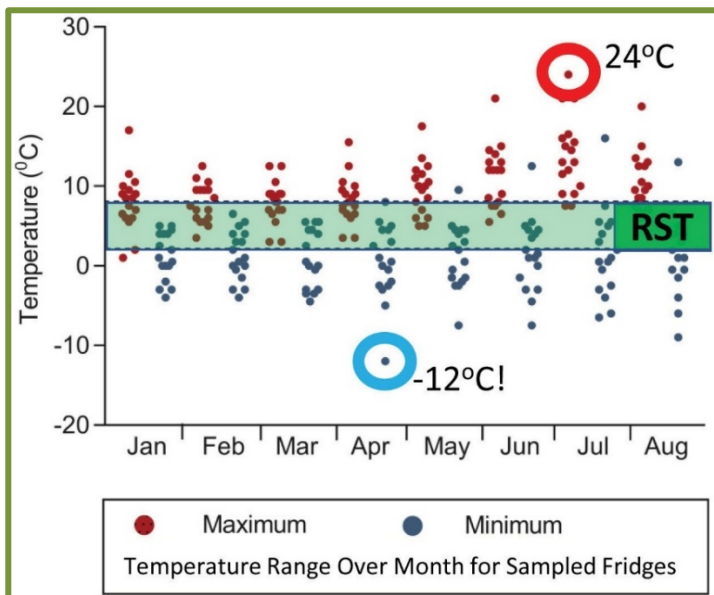
The economic impact of sub-optimal health and welfare in livestock is huge and costs the industry millions of pounds each year. With the drive to reduce the use of antibiotics on livestock of all types, vaccines are increasingly being used on farm. Storing these vaccines correctly is essential to maintaining their effectiveness.

Vaccines vary, but they generally require a storage facility that maintains temperature in the range of 2-8°C, the Recommended Storage Temperature (RST). Storage at temperatures outside this range can markedly impact the effectiveness of the vaccine, meaning that both the value of the vaccine is wasted but, more importantly, the animal to which it is administered is at risk because the vaccine may have no positive effect.

Given the above, it is important to understand both the efficiency of the farm's on-site storage at maintaining the required temperature range, and that of the vaccine itself.

Whilst some vaccines are kept by the vets at their practice and deployed by them when required, a significant number of farms store their own vaccines on site.

This is commonly done in domestic specification fridges, which have no thermostatic controls, and can be highly influenced by the conditions around them.



Work by PD Williams & G Paixão (*1) found in a study of fridges on UK farms, that the majority would have failed to keep the temperature within the RST.

It's not just a problem of overheating, the study recorded a fridge with an internal temperature of -12°C, which would have had severe effects on the vaccine.

Because domestic specification fridges do not have sophisticated temperature control systems and do not display internal temperatures, farmers can be unaware of the problem and may only suspect an issue when the animals start to suffer from the ailments that the vaccine should have protected them from.

Deploying a standard temperature and humidity sensor in the fridge would feed data back to an app that monitors the fridge's internal temperature. If temperatures recorded move outside the recommended range, an alert would be sent.

Using this simple, low-cost, sensor would give piece of mind that vaccines are kept in optimal conditions and remain effective.

Insulation material used in fridges does not affect the workings of the sensor device. The fridge sensor shown (right), successfully transmitted through the stone walls of the barn and over a hill to the base station.



(*1) Williams, P.D., Paixão, G. On-farm storage of livestock vaccines may be a risk to vaccine efficacy: a study of the performance of on-farm refrigerators to maintain the correct storage temperature. BMC Vet Res 14, 136 (2018). <https://doi.org/10.1186/s12917-018-1450-z>