



**Wisconsin Veterinary
Diagnostic Laboratory**
UNIVERSITY OF WISCONSIN-MADISON

***Salmonella enterica* serotype Dublin ELISA Testing**

Background information regarding serological testing of *Salmonella enterica* serotype Dublin

There are many methodologies in determining a current infection with *Salmonella enterica* serotype Dublin. These include conventional culture with serotyping or polymerase chain reaction (PCR). In addition, diagnostic laboratories in the United States and several countries in Europe also utilize an enzyme linked immunosorbent assay (ELISA) to measure the level of antibodies directed against O-antigens from *Salmonella enterica* serotype Dublin in both blood and milk samples. These ELISAs measure the humoral immune response as an indicator of current or previous infections. ELISA results are reported as a semi-quantitative percentage value, giving an optical density reading referable to a standard set of controls. Individual or bulk tank milk samples can also be conducted on ELISAs and have been used for screening / active surveillance programs for this serovar. Sensitivity for the serum ELISA is considerably higher than fecal culture for the identification of *Salmonella enterica* serotype Dublin infected cattle. As a diagnostic test, the serum ELISA is reported to perform best when used in animals between 3 and 10 months of age. (CL Holschbach *et al.*, 2017)

Interpretation of testing results

This serologic test can be performed on serum, plasma, milk and bulk milk tank samples. Results are reported as a percent positivity per PrioCHECK *Salmonella* Ab bovine Dublin ELISA recommendations. An animal that samples are collected from should be greater than 100 days of age for this specific test to be accurate.

Samples with a percent positivity of:

- Less than 35% are classified as negative for *Salmonella enterica* serotype Dublin antibodies
- Greater than or equal to 35% are classified as positive for *Salmonella enterica* serotype Dublin antibodies

A positive test result from an individual bovine indicates the presence of antibodies, which suggests that the animal has been exposed to, or is a carrier of, *Salmonella enterica* serotype Dublin.

A negative test result indicates the lack of antibodies and thereby a lack of exposure to *Salmonella enterica* serotype Dublin, or that there was an exposure event resulting in antibody production below the limit of detection for this test.

Individual animal management should not be based solely on an ELISA test result. As with any biological test, occasional false positives or negatives do occur as a result of local conditions within the animal, herd or location. Seroconversion can take up to 7 weeks following infection. A test should be interpreted in the context of all available clinical, historical, and epidemiological information. For further testing of animals with clinical symptoms, the Wisconsin Veterinary Diagnostic Laboratory (WVDL) offers PCR testing for *Salmonella* species including *Salmonella enterica* serotype Dublin. A carrier animal is defined as those that remain positive for three ELISA tests over an 8 to 12 month period (LR Nielsen *et al.*, 2004). An ELISA-positive animal may not yield a positive fecal PCR result as some animals shed *Salmonella enterica* serotype Dublin at an undetectable level and therefore PCR testing cannot be used to rule out the possibility of the animal being a carrier.