

Advanced microbial testing to improve disease detection in dairy calves



Dr Brito Rodriguez

Dr Brito Rodriguez hopes using advanced microbial testing tools will improve the accuracy and timeliness of disease detection in calves.

Dairy UP researchers using advanced microbial testing tools to better understand disease patterns in Australian dairy calves hope to improve the accuracy and timeliness of disease detection.

As part of their research, a broad spectrum of pathogens has been identified in pre-weaned calves, generating valuable baseline data and laying the foundation for better diagnostic protocols that can support improvements in disease monitoring, diagnostics and on-farm decision making.

Project lead Dr Barbara Brito Rodriguez, from the NSW Department of Primary Industries, says this could be a critical step in avoiding unnecessary use of antibiotics and preventing antimicrobial resistance.

“To have a clear and early diagnosis of what viruses, bacteria and parasites are causing a disease on a farm means you can target the control and treatment based on that,” Dr Brito Rodriguez said.

As part of the research, the Dairy UP team visited 72 New South Wales farms to collect nasal and rectal samples from both sick and healthy calves up to 7-weeks-old. In addition, samples were collected from cows that had calved within the past 50 days.

Dr Brito Rodriguez said the sampling strategy involved different farms in different regions to represent all NSW. The work focussed on calf scours and respiratory diseases in NSW dairy calves, but the findings enable early identification of new microbial variants and have the potential for broader application across Australian dairy regions.

The study found Rotavirus A on almost all farms, including some with vaccination programs. It also identified a range of viruses not previously thought to be common on NSW dairy farms, including Kobuvirus and Adenovirus, which are not usually tested by labs but were present on half the farms, and Rhinitis A and Rhinitis B, potentially important causes of respiratory disease. Pestivirus was found on 17 farms.

The team has prepared a series of fact sheets, collating current knowledge about 11 bugs for farmers and vets.

The study detected genes known to be used by bacteria to cause disease and commonly found in *E. coli* and *Campylobacter*, associated with scours, and identified several parasites associated with scours. Little evidence of *Salmonella* – considered an important microbe in calf scours and respiratory disease – was detected in this study.

Dr Brito Rodriguez said that in the past, diagnostic labs would test a sample for a particular pathogen but the new approach sequences all DNA and genetic material to test for different microbes.

“We don’t have to ask the sample what we have to test for – the sample will tell us what’s there. It’s untargeted testing which is unbiased in detecting all those organisms that are usually hard to test for in the lab.

“We are being more accurate with diagnostics and understanding what is present in those organisms.”

More research is needed to understand antimicrobial resistance and how that could be decreased, and the prevalence of the rotavirus bug. “We found rotavirus present in almost all farms,” Dr Brito Rodriguez said. “Some farms with really good management of calves in general, still have issues with rotavirus, and we want to understand the genetic diversity of the bug and if that is impacting the vaccine that is used to prevent it.”

The project is part of Dairy Up’s portfolio of projects aimed to unlock the potential of cows and is a collaboration between researchers from Dairy UP, University of Technology Sydney (UTS), NSW DPI, Elizabeth Macarthur Agricultural Institute, Scibus and the 72 participating dairy farms. Two PhD students enrolled at UTS, Zain Ul Abedien and Aleksandra ‘Ola’ Stanczak, are working on the project. ■■

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