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School of Health, Medical and Applied Sciences

Case study: Unleashing gut biota for better health and more productive poultry

The secrets to unlocking some of life's greatest challenges can be hidden in the most unusual places ... and that includes the gut inhabitants of humans and animals.

Through her work investigating microbiota, CQUniversity researcher Dr Dana Stanley has revealed new insights into a raft of human health problems, from obesity to prostate cancer, as well as ways to boost poultry production.

The work has grabbed the attention of researchers around the world, with numerous papers being published in prestigious journals including *Nature Communication*, as well as popular national ABC science program, *Catalyst*.

"The gut produces such large numbers of molecules that are sent to all of the other parts of the body and in this one organ there are answers that can be applied across multiple health issues," Dr Stanley said.

"For animals it's about improving the immune response by controlling the pathogens in the gut in order to improve nutrient retention and reduce the need for antibiotics," she said.

"We have shown that with an organic diet supplemented with natural alternative to antibiotics, we can restore imbalanced intestinal microbiota and boost immune resistance to new-coming bacteria for diseases like spotty liver.

"By administering beneficial microbiota at hatching, we can ensure permanent colonisation of the beneficial bacteria and this results in improved growth rates in the birds, with meat chickens reaching target weights earlier and layers producing eggs more efficiently."

Dr Stanley's poultry work has been financially supported by the Australian Research Council, following a competitive bid through its Discovery Early Career Research Awards, as well as the Poultry CRC.

In ensuring the research is industry-relevant, together with Professor Kerry Walsh and Dr Surya Bhattarai, she has worked closely with D&H Hall and organic seed producer Mara Seeds, in running successful commercial scale trials spanning more than 10,000 birds which have confirmed the benefits of the mixing probiotics daily into feed rations.

The team, which includes scientists from RMIT, SARDI and CQUniversity, is now working towards commercialising the food supplement formula to widen its adoption within industry.

Juggling long hours of complex research involving specialist teams located across Australia, Dr Stanley's research is also being applied to human health issues.

Microbiota, including short chain fatty acids and metabolites produced by bacteria in the human gut, has also been found to reduce the severity of colitis, asthma and Type 1 diabetes.

"Working in conjunction with eminent immunologist Professor Charles Mackay and his team at Monash University, we have shown that by adding some bacterial metabolites to food, or manipulating bacteria in the gut to produce metabolites, can almost remove the presence of some diseases in mice," she said.



Through the Clinical Research Institute and the Westmead Specialist Centre, large-scale clinical trials involving prostate patients are now underway.

“We’re really just at the tip of the iceberg as to the potential applications for this field of research - it’s challenging work but it’s a really exciting time to be at CQUniversity and collaborating with the leading institutions around Australia,” she said.

Dr Stanley’s leadership and research knowledge has also been recognised with a seat on the National Health and Medical Research Council committee.

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