

# Novel vaccine to stop the spread of Japanese encephalitis virus in pigs

Scientists at The University of Queensland have developed a novel vaccine for Japanese encephalitis virus (JEV) in pigs, to help stop the spread of the disease in Australia.

The mosquito-borne disease can also severely affect humans, but cannot be passed from pigs to people and commercially-produced pork products remain safe to consume.

Dr Jody Hobson-Peters from UQ's School of Chemistry and Molecular Biosciences said the new vaccine will help keep the virus at bay.

Japanese encephalitis virus can cause production problems on pig farms, but more alarmingly it can lead to serious neurological symptoms in humans that are sometimes permanent or fatal.

When pigs are bitten by virus-carrying mosquitoes the virus is amplified, increasing the risk to people who may be bitten by a mosquito.

By vaccinating pigs and stopping them from contracting the virus we'll help stop this pathway to humans – hopefully saving lives as well as keeping pigs healthy."

Dr Jody Hobson-Peters, UQ's School of Chemistry and Molecular Biosciences

UQ-developed chimera virus technology was used to make a 'hybrid' version of the virus, using a harmless-to-humans, mosquito-only Australian virus – the Binjari virus.

"The resulting chimeric – or hybrid – virus looks identical to JEV but can only grow in mosquito cells and also happens to be dead in this vaccine, so is very safe to use," Dr Hobson-Peters said.

"When injected into pigs – or other species – the hybrid virus is recognised as JEV by the immune system which generates antibodies and provides immunity.

"We're hoping it will be developed into a JEV vaccine for humans and a version for horses, which can also suffer from JEV-induced neurological symptoms."

The project was supported by Australian Pork Limited, with recent efficacy trials conducted on pigs at the Elizabeth MacArthur Agriculture Institute.

UQ's Professor Roy Hall said the vaccine performed extremely well.

"More than 90 per cent of the young pigs in the trial were protected from JEV infection, and we expect the same in other species like humans and horses," Professor Hall said.

"The researchers are now working with veterinary company Treidlia Biovet on manufacturing the vaccine so it can undergo safety trials on a larger scale.

"Pending successful outcomes, we hope to roll the vaccine out commercially later in 2023 – a fantastic outcome."

Professor Hall said the development of an effective vaccine in Australia is now critical, with JEV likely to be here to stay.

"This dangerous virus will remain a major health threat to humans, and a big problem to the pig and horse industries," he said.

"Australia's current weather patterns are conducive to its further spread here, so it's crucial that we have a safe and effective Australian-made vaccine available.

"We're proud that Australian science can be at the forefront of tackling this virus."