

Gene editing to support genetic improvement in livestock

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Transgenic animals – animals with additional genes

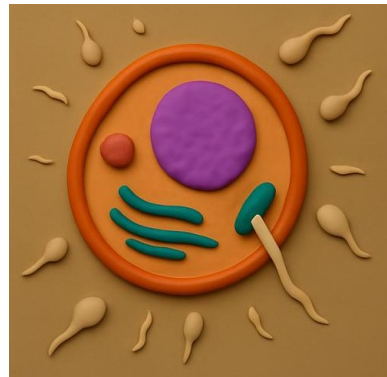


How genetic manipulation has changed during my career?

How do I get my transgene into a cell???

How do I get appropriate expression???

Random integration of transgenes



Novel promoters

Difficult, inefficient and unpredictable



How genetic manipulation has changed during my career?

Then things got a bit easier.....

Transgene delivery via viral vectors

Still somewhat laborious

Simple, efficient but still unpredictable

Only good for adding genes



How genetic manipulation has changed during my career?

Today

Transgenesis still has a place

Gene editors have transformed the field

Targeted transgenesis

Efficient designed changes to host genome

Baby-steps, one gene at a time

Multiplexing to combine monogenic traits

CRISPR/Cas fusions

Prime editors

Base editors

CRISPRi (repression)

CRISPRa (upregulation)

Methylation/Acetylation

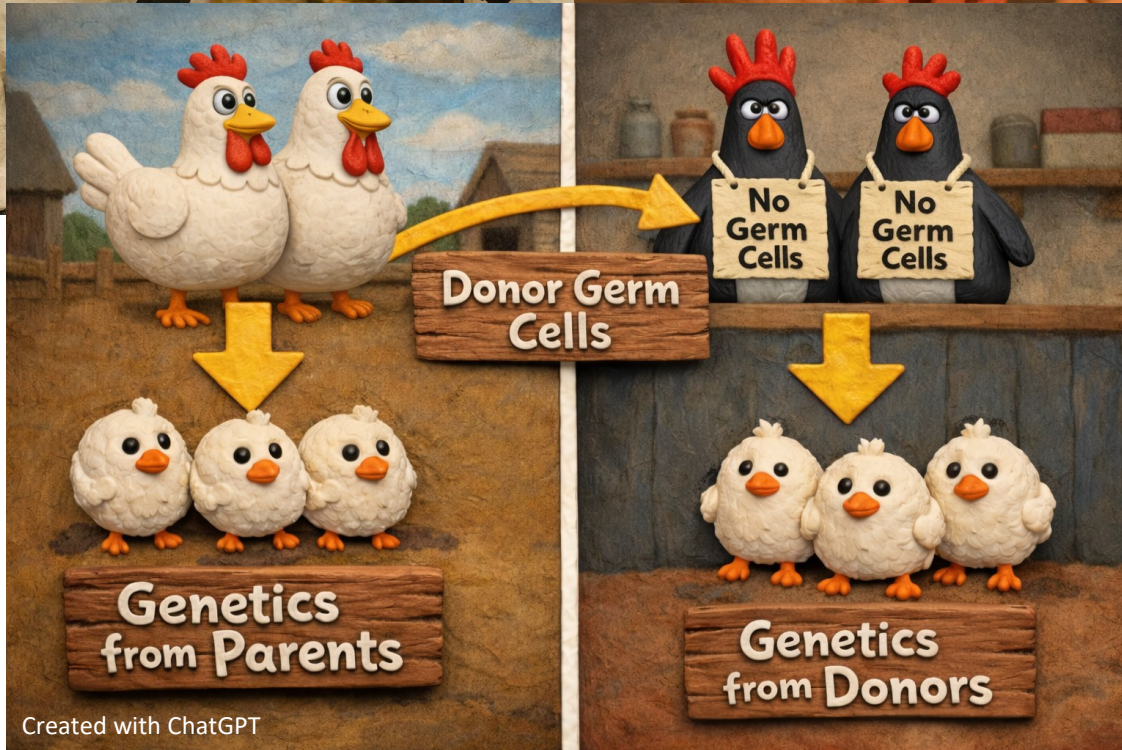


Improved livestock for agriculture

Created with ChatGPT



Created with GPT-4o



Created with ChatGPT

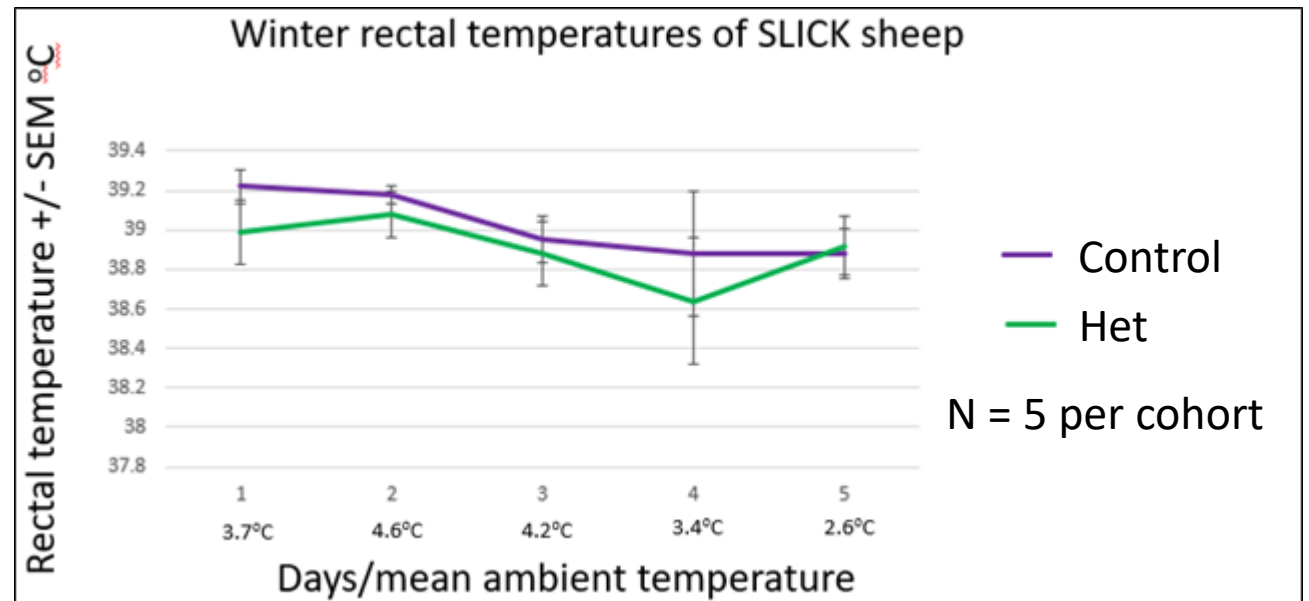
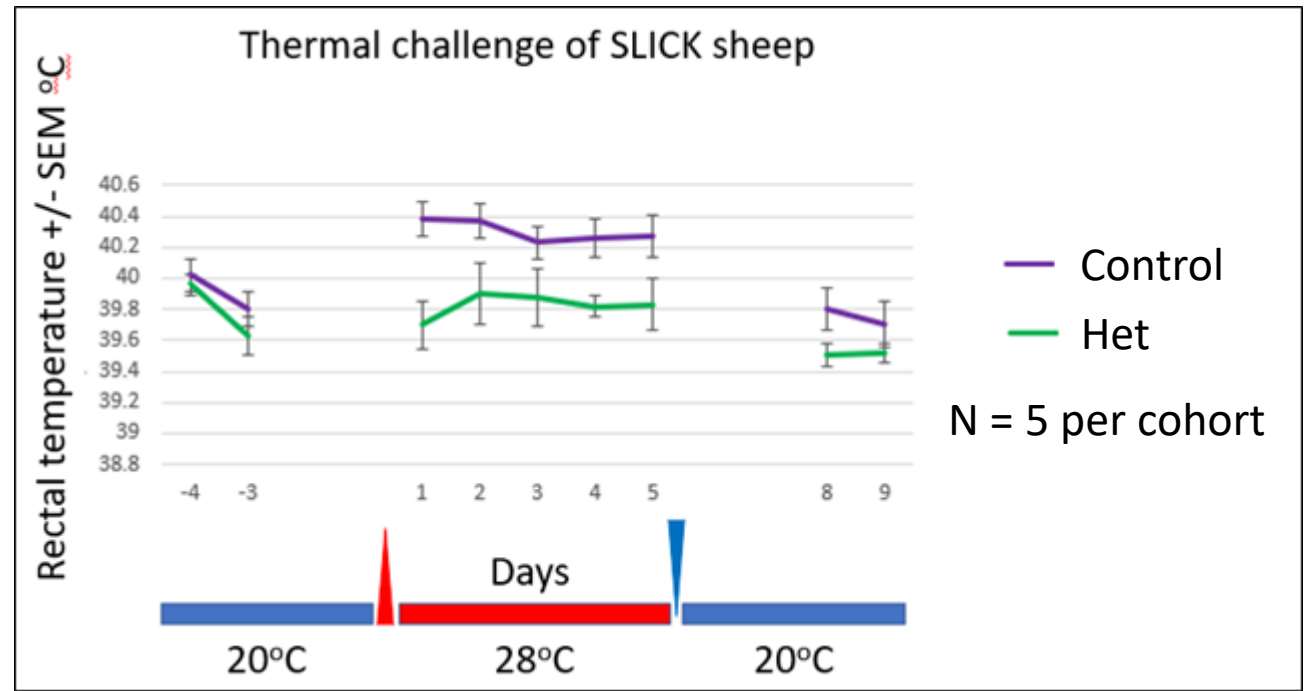


Gene editing the prion protein gene

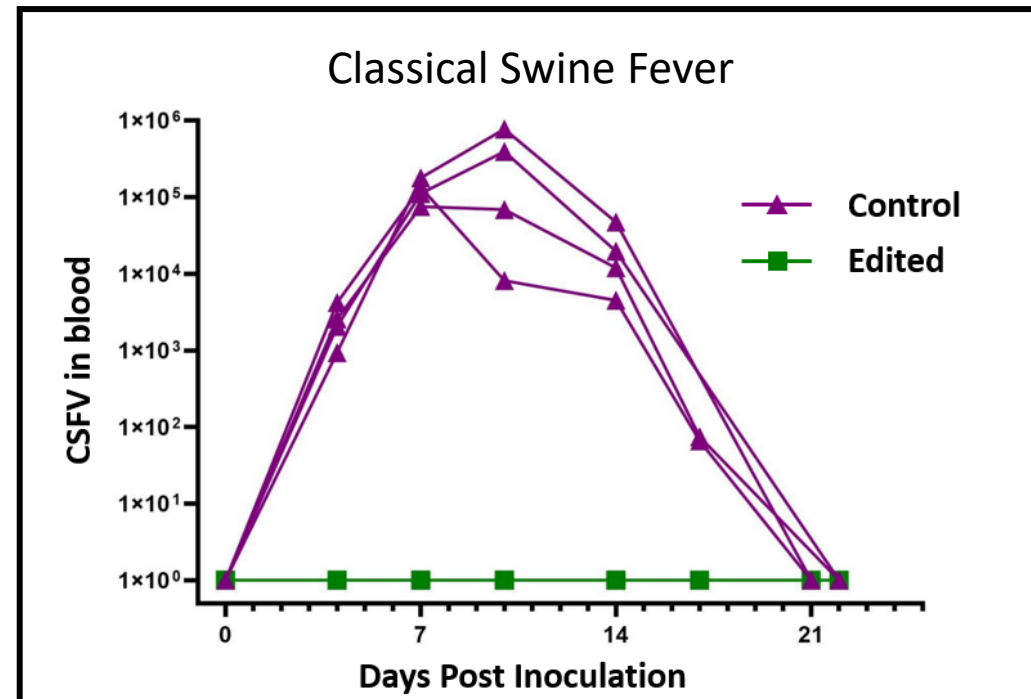
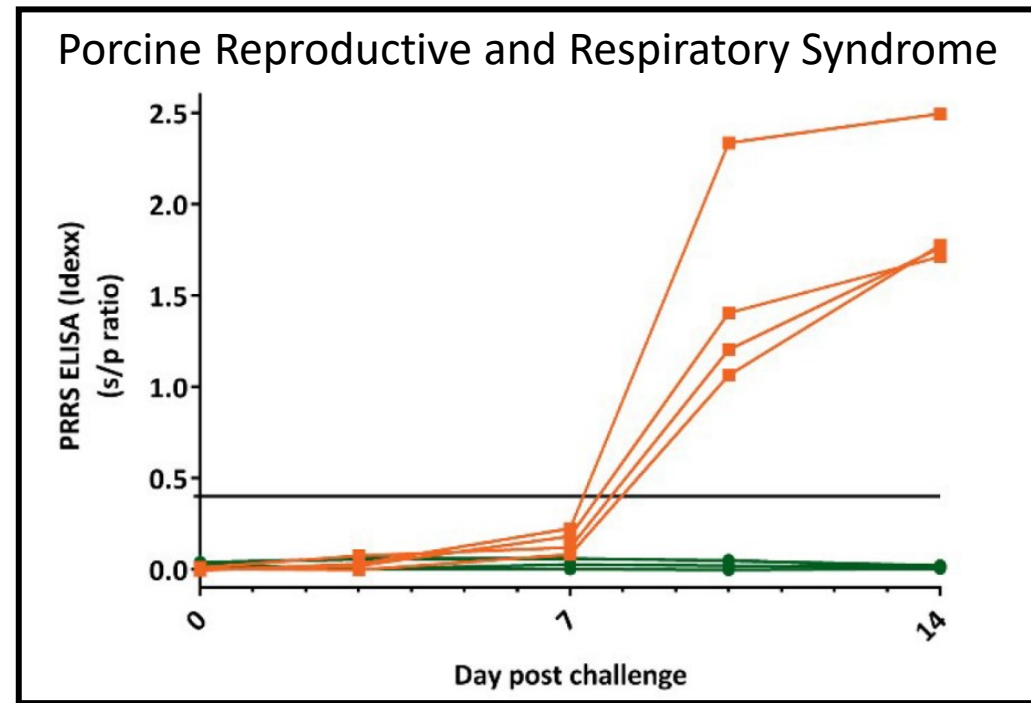


Gene editing for heat tolerance





Gene editing for disease resistance



Scale up to commercial production and approval challenging



UK's Genus secures FDA approval for PRP gene edit; shares soar

By Chandini Monnappa

April 30, 2025 11:01 AM GMT+1 · Updated 2 hours ago



April 30 (Reuters) - British animal genetics company Genus ([GNS.L](#)) on Wednesday said the U.S. Food and Drug Administration (FDA) approved its PRP gene edit under its PRRS Resistant Pig ("PRP") programme for use in the U.S. food supply chain.

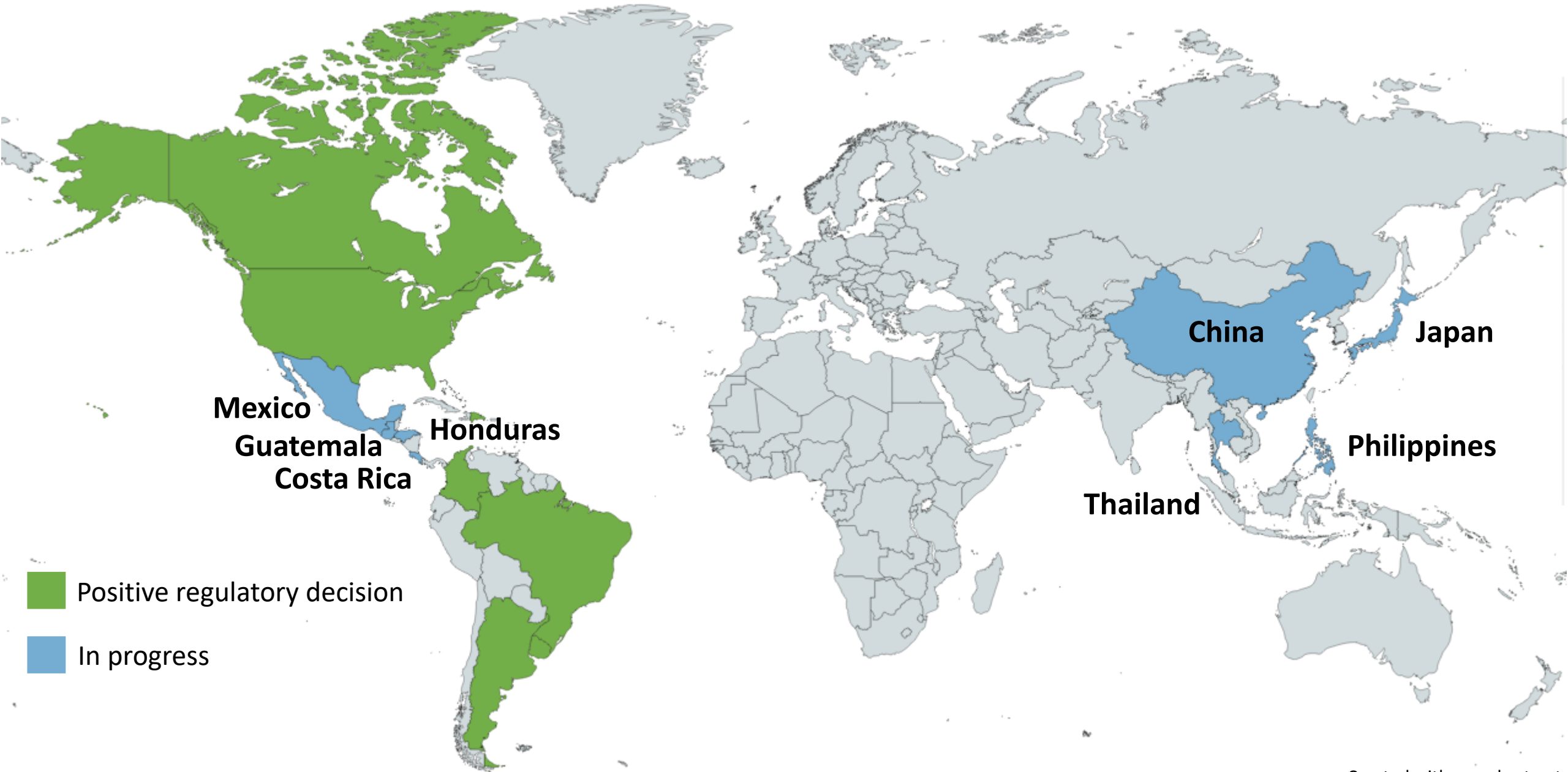
PRRS caused an estimated \$1.2 billion per year in lost production in the U.S. pork industry from 2016 to 2020, an 80% increase from a decade earlier, according to an analysis published in 2024 by an Iowa State University expert.



In its capital market update in November 2023, Genus had said that its PRP is resistant to prevalent PRRS strains.

Genus' shares rose as much as 30% to a near six-month high, and were on track for their biggest one-day gain since December 2008.

PRP won't really start affecting Genus' income statement until fiscal year 2027, but it could supercharge growth from then on, said Seb Jantet, research analyst at Panmure Liberum.

PRRSV-resistant pigs: pathway to market



 Positive regulatory decision
 In progress

Animal products are traded globally



With specific exceptions

