

# Understanding the Impact of Porcine Rotavirus

## Virulence, Prevalence, and Impact on Herds: A Detailed Analysis

Porcine rotaviruses exhibit a remarkable ability to persist within swine populations worldwide. Of the 7 antigenically distinct serogroups of rotaviruses, 4 (A, B, C, E) affect swine. Most is known about the more common group A rotaviruses. Type C is currently considered clinically most significant. Immunity is not cross-protective between serogroups and is incomplete between genotypes. Rotaviruses are very stable in the environment. They are resistant to temperature changes, many chemicals, various pH levels, and many disinfectants.

## Variability Across Regions and Age Groups: Insights from University of Minnesota Veterinary Diagnostic Laboratory.

In the USA, Marthaler et al. (2012) conducted extensive analysis at the University of Minnesota Veterinary Diagnostic Laboratory, revealing intricate dynamics. They observed that 86.4% of examined samples (N = 173), displaying current or prior gastrointestinal symptoms, exhibited co-infection of Rotavirus A, B, and C, along with various combinations (Figure 1A). This pattern was especially prominent in pigs aged less than 21 days, with co-infections more prevalent in nursery or finisher-aged pigs. The research unearthed 20 distinct VP7 (G) gene fragments for Rotavirus B, showcasing the highest genetic diversity in Minnesota, Missouri, and Oklahoma (Figure 1B).

## Economic Impact of Porcine Rotavirus: Challenges and Consequences

In the US, the ubiquity of rotaviral strains among pigs is undeniable, with nearly 100% testing positive. Pre-farrowing sow vaccinations bolster offspring immunity through vital antibodies—colostrum's IgG and milk's IgA. Yet, challenges arise, as improper colostrum intake due to litter size or chilling can compromise nursing piglet immunity. Surviving early diarrheal infection can cast a shadow over a pig's life, leading to sluggish growth and inefficiency.

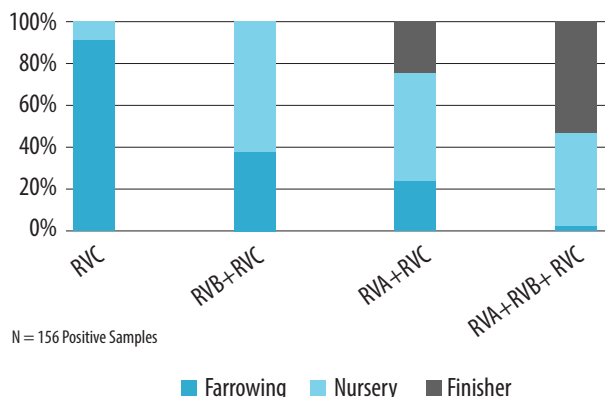
Compounding economic losses, rotavirus-inflicted intestinal damage after weaning invites the colonization of enteropathogenic E. coli, further impairing pig health.

For U.S. producers, the impact is stark. Divergence between gilt litters and multiparous sows in post-weaning IgG prevalence highlights a significant financial implication. Presuming subclinical or post-infected rotavirus involvement, gilt morbidity potentially extends market times and elevates feed costs. This scenario translates into an approximate cost of over \$4 per gilt pig slaughtered or up to \$1 per pig, reflecting about 20% of pigs sourced from gilt litters.

## Conclusion: Navigating Porcine Rotavirus Challenges

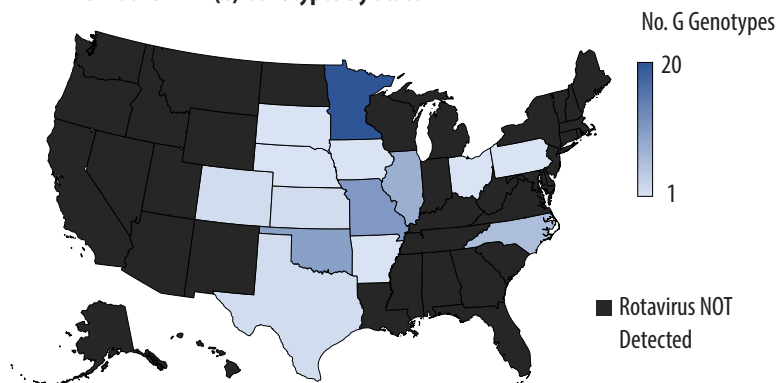
Global studies uncover diverse prevalence, spotlighting virus adaptability. The University of Minnesota's research unveils co-infections and genetic diversity nuances. Economically, porcine industry strains persist. Rotavirus challenges span impaired immunity to growth inefficiency. For U.S. producers, gilt litters' IgG disparities amplify costs per pig.

PCR Positive Samples (%) By Production Phase



▲ **Figure 1.** Adapted from Marthaler et al., 2012. (A) The prevalence of Rotavirus A, B, C and coinfections by phase of production and (B) the genetic diversity of Rotavirus B by state of submitted samples.

Number of VP7 (G) Genotypes By State



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