

Season 5, Episode 7: Pelvic Organ Prolapse (POP) – Understanding the Problem and Solutions

Dr. Jack Dekkers, Iowa State University, and **Dr. Jenelle Dunkelberger**, Topigs Norsvin, share the importance of Pelvic Organ Prolapse (POP), what factors contribute to POP, and ways breeders and producers can reduce the risk of prolapse through nutrition and management.

What is POP?

Pelvic Organ Prolapse (POP) is a condition where pelvic organs, such as the uterus, bladder, or rectum, descend from their normal position due to weakened support structures. This condition has become a growing concern in the swine industry, contributing to a steady increase in sow mortality since approximately 2013. Sow mortality has been characterized into three primary buckets: POP, lameness (issues with feet and leg structure), and other unknown causes.

Over the past decade, efforts to understand the underlying causes of POP have intensified. In 2018, Dr. Jason Ross from Iowa State University initiated a comprehensive study known as the Pelvic Organ Prolapse project. This research, based on data collected from over 100 farms, identified several risk factors for POP, including bump feeding strategies, water treatment methods, perineal scores, and body condition. Additionally, genetics emerged as a significant area of interest, highlighting the multifactorial nature of the condition and the need for a combined approach involving both management improvements and genetic solutions.

Genetic Factors Contributing to POP

Topigs Norsvin, a leading genetics company, has conducted extensive research into the genetic components of POP. Initial investigations using pedigree data revealed that POP has a heritability of approximately 22%, challenging the belief that the condition was minimally or non-heritable. Collaborating with Iowa State University, Topigs Norsvin expanded this research by employing genomic data. PhD student Vishesh Bhatia analyzed data from 25,000 genome-wide markers, providing a more precise measure of genetic relationships.

This genomic analysis revealed that POP heritability is around 35%, indicating a stronger genetic influence than previously understood. Moreover, the research identified specific genomic regions linked to prolapse, associated with genes involved in critical biological processes such as reproductive hormone regulation, collagen synthesis, fibroblast activity, and elastin production. These findings underscore the potential for genetic selection to reduce the prevalence of POP.

How to Reduce POP

Reducing Pelvic Organ Prolapse (POP) requires a combination of improved management practices and targeted genetic selection. On the management side, producers and breeders should focus on maintaining optimal body condition and perineal scores in sows, as extremes in body weight can increase physical stress on the pelvic region. Implementing precise feeding strategies, especially during late gestation are essential steps to minimize risk.

On the genetic side, selective breeding offers significant potential for reducing POP. With heritability estimated at 35%, breeders can target specific genetic traits associated with prolapse risk, including genes tied to reproductive hormones, collagen, fibroblast activity, and elastin. Integrating genomic tools into breeding programs can lead to a gradual reduction in the frequency of POP. By combining optimized management practices with genetic advancements, the swine industry can adopt a comprehensive approach to mitigate POP, enhancing both sow welfare and productivity.

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