Determining Fertility Potential at Weaning using Lipdome Profiles

A rapid vaginal swab test and lipid profile analysis allows for earlier, cost-effective identification of fertile female pigs, improving breeding selection and long-term cost savings in sow breeding.

Researchers at Purdue University have developed a new method for determining fertility potential of young female pigs at weaning using lipidome profiles. Currently, ~50% of young female pigs selected at 3 weeks of age are infertile by the time they reach 32 weeks of age. The new technique created by Purdue researchers can identify gilts to replace sows in a breeding herd and reduce the age of identification by 6 months, allowing for a more cost-effective solution for breeding selection. Purdue researchers have identified that a low level of fatty acid complexes including arachidonic acid and docosahexaenoic acid and a prominent level of two very-long chain fatty acids, cerotic and ximenic acid, are a strong indicator of potential long-term fertility. A screening assay has been created with a rapid vaginal swab test for obtaining lipid samples that can be rapidly characterized for lipidome analysis.

Advantages:

-Rapid Testing

-Long-Term Cost Savings

-Improves Selection of Gilt with Potential Fertility

Potential Applications:

-Agriculture and Farming

-Sow Breeding

-Gilt Selection

Technology Validation:

Technology ID

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Category

Biotechnology & Life Sciences/Biomarker Discovery & Diagnostics
Agriculture, Nutrition, & AgTech/Livestock & Animal Health Solutions

Authors

Theresa Casey
Christina R Ferreira
Kara Stewart

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Development of a screening assay with a swab for lipidome biomarker analysis.

Additional Innovator Biographies:

Dr. Kara Stewart is an Associate Professor of Animal Sciences at Purdue University. Dr. Stewart earned a Bachelor of Science from Purdue University and Master of Science and PhD in Animal Science from North Carolina State University. Dr. Stewart's emphasis is on the development of an innovative Extension and research program targeted toward improving reproductive efficiency in swine and beef cattle. In general, Dr. Stewart focuses on management practices, including feeding strategies, and adoption or improvements in reproductive technologies to improve reproductive outcomes in livestock. â€‹ Her research interests include reproductive physiology, reproductive management in farm animals, mammary gland biology and lactation, artificial insemination, cell cultures, and data analytics and statistics.

Dr. Christina Ferreira is a Lipidomics Research Scientist with Purdue University's Bindley Bioscience Center. Dr. Ferreira is a earned a Bachelor of Science in Veterinary Medicine, Master of Science in Animal Reproductive Biotechnology, and PhD in Animal Biotechnology and Embryology at the State University of Sao Paulo, Brazil, also completing a Residency in Animal Reproduction. In 2008, she started post-doctoral training at the University of Campinas in Brazil focusing on mass spectrometry focused in the area of culture media metabolomics and lipidomics of embryonic early development. In 2010 she came to Purdue University to work with Dr. Graham Cooks on diverse projects with lipid analysis and in Parkinson's disease biomarker search in cerebrospinal fluid. Due to her chemical-biological background, Dr. Ferreira has developed and introduced diverse tailored analytical approaches. Dr. Ferreira works with the Metabolite Profiling Facility faculty at Purdue University to develop high-throughput metabolomics analysis focused on lipid profiling. Her research interests include molecular biology and animal biotechnology.

TRL: 2

Intellectual Property:

Provisional-Patent, 2020-12-22, United States | NATL-Patent, 2021-12-17, Europe | PCT-Patent, 2021-12-17, WO | NATL-Patent, 2021-12-17, Israel |

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