Consensus Statement on the Translation and Application of Genomics in the Equine Industries

A group of scientists met at the 12th Dorothy Russell Havemeyer International Horse Genomics Workshop in Pavia, Italy from September 12-15, 2018 and have agreed the following:

- The overarching goal of the equine genomics research community, set out in 1995, is to improve the health and welfare of the horse. The developing field of genomics will continue to provide knowledge and tools to enable informed breeding and management for the improved welfare of the horse.
- In the ten years since the publication of the horse genome sequence, there has been continual development of new genomic tools to increase our understanding of the structure and function of the horse genome.
- These tools and knowledge have led to considerable advances in understanding the molecular variants underlying key equine health, appearance, and performance traits.
- These variants are likely to prove useful as genetic markers for risk of disease or other traits of economic importance.
- In addition, advances in functional genomics, bioinformatics, and computational biology are revealing the fine detail of the biochemical and cellular pathways underlying equine traits of interest, which may lead to novel diagnostic and therapeutic approaches to influence and regulate them.
- The equine genomics research community, however, recognises there are practical, educational, and societal challenges facing the translation of the outcomes from the Horse Genome Project into practice.

Therefore, the workshop participants note that:

1. It is important that industry stakeholders are provided with the appropriate opportunities for education so that scientific developments are best communicated for translation into practice that will have the greatest potential to benefit the horse.
2. Scientific discovery covers a wide spectrum of basic to applied research and resulting discoveries may be translated directly or indirectly into practice for the benefit of the horse. Given commercial motivations, however, clear disclosure of potential conflicts of interest should be made both in relation to funding sources for the reported study and professional affiliations of the authors.
3. Scientific discovery should be reproducible, the data should be publicly available, when not in conflict with confidentiality, and the results and conclusions must be published in peer-reviewed journals.
4. In industry communications, including journalism and other public media, there must be a clear distinction between published peer-reviewed science and anecdote or opinion.
5. Scientific research projects should conform to best practice in relation to informed owner consent for use of samples and research ethics.
6. Many of the current platforms allow for partitioning of genetic variants contributing to complex traits in horse breeds. Continued development of these tools will further enhance these capabilities.
7. As a consequence of the genetic population structure, the application of genetic information is more straightforward in horse breeds compared to humans.
8. For some Mendelian traits, genetic tests may be diagnostic. For complex traits involving multiple genes and gene-environment interactions, genetic testing may instead be viewed as a screening and selection tool.
9. The integration of genetic information with traditional breeding approaches will be valuable to the sustainability of a healthy horse population for the future.

10. The equine genomics research community continues to welcome collaboration and cooperation with the equine industries.

Equine Genome Workshop Scientists' Approval of Consensus Statement:

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