LEARNING AREAS: DESIGN AND TECHNOLOGIES, SCIENCE

Research and Development in the Thoroughbred Industry

Primary Industries Education Foundation Australia

TBA — Thoroughbred Breeders Australia

Research and Development in the Thoroughbred Industry

Research and development (R&D) in the Australian thoroughbred industry helps improve how horses are bred, trained, and cared for. The adoption of innovation and new technologies allows the industry to enhance horse performance, improve health outcomes, and ensure its economic viability. The insights gained through R&D contribute to better breeding strategies, safer training practices, and more effective healthcare for racehorses. As a result, R&D is vital for maintaining the competitive edge of Australia's thoroughbred industry on the world stage.

The impacts of research and development

Research and development bring many benefits to the thoroughbred industry, especially in horse health and welfare. Advances in veterinary science, like genetic testing and digital imaging, help detect health issues early, allowing for quicker treatment, helping to keep horses healthier and provide them with a better quality of life. Better health also leads to better performance. Trainers can use technology such as tools designed to monitor how a horse is performing during training and adjust their routines to help them improve safely. This not only leads to faster, stronger horses but also increases the value of the horses and the industry's overall success.

In addition to health and performance, R&D has positive economic impacts for the thoroughbred industry. Healthier and faster horses lead to better race results, which increases their value at sales and results in larger amounts of prize money for the sector. This benefits the entire industry, making it more profitable and contributing significantly to the Australian economy.

R&D organisations in the thoroughbred industry

AgriFutures Australia is a federal government Research and Development Corporation that manages the Thoroughbred Research Levy, which is responsible for conducting research and development for the thoroughbred industry. This organisation supports research projects that aim to improve all aspects of the industry, from breeding and training to animal welfare and environmental sustainability.

Other organisations involved in R&D within the thoroughbred industry include universities, such as the University of Sydney's Equine Health Research Centre and the Equine Centre at the University of Melbourne. These organisations work on research projects aimed at improving different aspects of the industry, such as the prevention, management, and treatment of equine diseases and injuries.

Another important organisation involved in R&D in the industry is Racing Australia, which researches aspects such as improving racing safety (e.g., studies on track surfaces and their impact on horse performance and injury rates). These organisations and their research projects are important in ensuring that the thoroughbred industry continues to innovate and improve.

Research and development careers

There are many science, technology, engineering, and mathematics focused careers involved with research and development for the Australian thoroughbred industry.

Veterinary scientists are responsible for developing new diagnostic tools, treatments, and preventative measures for injuries and diseases. They collaborate with other specialists to create advanced technologies such as digital imaging and genetic testing, essential for maintaining horse health and improving breeding practices.

Geneticists have an important role in studying horse DNA to identify traits that lead to better health, speed, and endurance. Their research helps breeders select the best horses for producing foals with desirable characteristics such as speed and strength which is key to the success of the industry. Geneticists may also work on projects aimed at reducing genetic disorders, ensuring the long-term viability of thoroughbred populations.

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Equine nutritionists research and develop specialised diets that enhance horse performance and recovery, ensuring that thoroughbreds receive the right balance of nutrients. Their work is important in tailoring diets to individual horses, which can significantly impact their health and racing success.

Technologists and **engineers** are involved in designing and developing the equipment used in training, monitoring, and caring for thoroughbreds. They work closely with trainers and veterinarians to create technologies that improve horse welfare and performance.

Data analysts interpret the data generated by technologies used in breeding, training, and racing. By analysing performance metrics, health data, and breeding outcomes, they help trainers and breeders make informed decisions that can improve horses' health and track results.

Research coordinators and **project managers** oversee R&D projects within the industry. They ensure that research is conducted efficiently and the findings effectively implemented in practice. These roles often involve coordinating between different organisations, such as universities, breeding associations, and racing bodies, to ensure that the industry benefits from the latest scientific advancements.

**Record your responses to the questions below in a workbook or a digital document:**
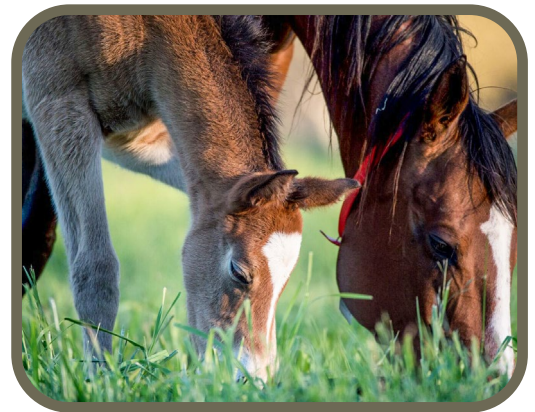
a) Explain how research and development (R&D) activities contribute to the health and welfare of thoroughbred horses in the Australian industry.

b) What role does genetic testing play in breeding thoroughbred horses, and how does it impact the overall success of the industry?

c) Describe the economic benefits that can result from advancements in veterinary science and technology within the thoroughbred industry.

d) Identify and explain the roles of two organisations involved in research and development within the Australian thoroughbred industry.
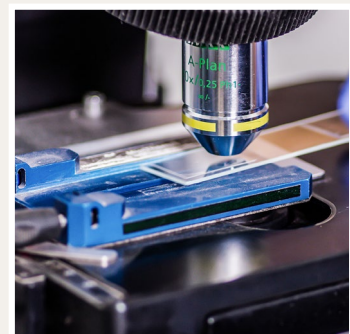
Research and development
Case studies

Developing a novel diagnostic test for early pregnancy in the mare is an R&D project conducted by The University of Newcastle, in collaboration with AgriFutures Australia.

This project aims to make breeding thoroughbred horses more successful by developing a new way to detect and monitor early pregnancy. Even with the best breeding practices, many attempts still fail, causing economic losses. Although fertilisation happens about 95% of the time, only around 65% of these pregnancies result in a foal. Better ways to monitor pregnancies are urgently needed. In this project, scientists will use advanced technology to compare the blood of early pregnant and non-pregnant mares, looking at proteins and fats. They will also study the unique features of horse pregnancy in the lab. This research aims to create a simple, quick, and accurate blood test that can be used on farms to detect early pregnancy and help understand why some pregnancies fail early on.

Adapted from Developing a novel diagnostic test for early pregnancy in the mare (AgriFutures Australia, 2023)

e) Identify the name of the research and development project.

f) Describe the industry challenge/challenges this research project aims to address.

g) Explain how this research could improve the social, economic, and/or environmental sustainability of the thoroughbred industry.

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Professor Chris Whitton, Head of the Equine Centre at the University of Melbourne conducted a research project funded by AgriFutures Australia, designed to develop knowledge about how racetrack surface selection can improve safety for racehorses and jockeys.

Scan the QR code or click on the link to hear about this research on the AgriFutures On Air episode: **Courses for horses: Improving racetrack surface selection for safer conditions for thoroughbred racehorses (20:50)**

https://agrifutures.com.au/resource/courses-for-horses-improving-racetrack-surface-selection-for-safer-conditions-for-thoroughbred-racehorses/

After listening to the podcast, record your responses to the questions.

h) Identify the name of the research and development project.

i) Describe the industry challenge/s this research project aims to address.

j) Explain how this research could improve the social, economic, and/or environmental sustainability of the thoroughbred industry.

Learning Areas | Australian Curriculum Content:

Design and Technologies
Analyse how people in design and technologies occupations consider ethical, security and sustainability factors to innovate and improve products, services and environments (AC9TDE10K01)

Science
Explain how scientific knowledge is validated and refined, including the role of publication and peer review (AC9S9H01, AC9S10H01)

ATTRIBUTION, CREDIT & SHARING

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