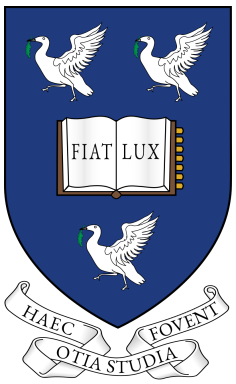
Standard operating procedure (EPA)

Anders Jensen



Equine Protein Atlas

Cornea

Background

The equine eye is highly sensitive and prone to various diseases and injuries due to its large size and exposed position. Early diagnosis and treatment are critical to preserving vision and preventing complications. Among the ocular structures, the cornea—the transparent, dome-shaped outer layer of the eye—is particularly vulnerable to injury and disease.

As horses age, they are prone to various eye conditions, including corneal degeneration, recurrent ulcers, and changes in transparency due to reduced healing capacity and cellular function. Common corneal issues include calcific keratopathy (calcium deposits), lipid keratopathy (fat accumulation), and chronic or non-healing ulcers, which may result from trauma or age-related degeneration. Age-related systemic conditions, like equine recurrent uveitis (ERU) and glaucoma, can also indirectly affect the cornea by causing vascularization, scarring, or edema. Routine eye exams, prompt treatment of infections or injuries, and supportive measures, such as proper nutrition and UV protection, are essential to managing these conditions and preserving vision in older horses.

Equipment needed

1. Rounded scissors
2. Scalpel
3. Scissors
4. Tweezers
5. Liquid Nitrogen
6. Formalin

Methods

1. Collect equine heads from abattoir or following informed consent and ethical approval from horses donated for veterinary research . Take details of age, breed and sex from passport. Avoid leaving head in fridge for more than 24h.
2. If this is not possible use equine dentition to determine age and sex (Click here)[https://extension.usu.edu/equine/research/aging-horses-by-their-teeth]
3. To gain access to the eyeball, first use a scalpel to cut around the eye lid (Left side)
4. Then use rounded scissors to cut any connective tissue
5. When the eye can be gently lifted cut the optic nerve
6. Gently remove the eyeball
7. Make an vertical incision with a scalpel along the center of the cornea
8. Pull center of eye with tweezers and cut central region of cornea (100mg)
9. Ensure sample is translucent
10. Split the tissue into two

    A. One part into 10% formalin in an appropriate container for histology and one for protein which will be snap frozen.

    B. Place into an appropriate sized and LN proof tube. Ensure tubes are suitable for liquid nitrogen
11. Annotate sample with age, type of tissue and date collected
12. Transfer to labelled box store at -80°C (Age, Type of Tissue, Date of collection)

13. Remove rest of cornea for histological processing
14. Store in 10% Formalin