Ophthalmic Anatomy and Examination of Camelids

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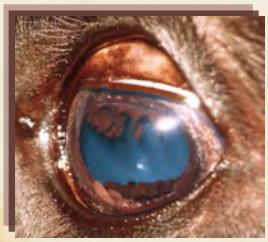
Camelid Vision

- **Alpacas**
  - **Nearly emmetropic (normal vision)**
- **Llamas**
  - **Slightly myopic (near-sighted)**
  - **Esp. females: pregnant>barren**



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Llama/Alpaca Ophthalmic Anatomy

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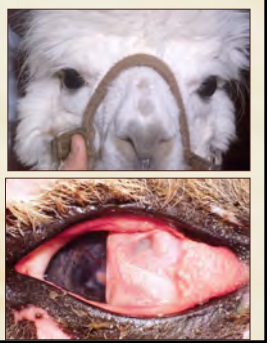
Camelid Adnexa

- Long vibrissae
  - Tactile hairs
- No meibomian glands in eyelids
- Prominent fleshy medial caruncle
  - Contains sebaceous glands
- Nasolacrimal anatomy
  - Similar to horse



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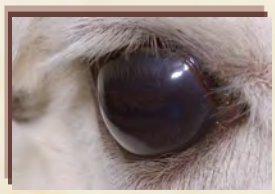
Camelid Cornea

- Prominent corneal curvature
- Ovoid shape
- Heavily pigmented limbus
- Thickness= 0.5-0.6mm
- Thick epithelium
  - 12-15 layers
  - Protective against microtrauma, UV light, dehydration



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Camelid Iris

- Ovoid pupil
- Prominent pleated **iridal folds** instead of corpora nigra
  - Extensions of the posterior pigmented epithelium of iris

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Camelid Iridal Folds

- Interdigitate when pupil is constricted

Newborn cria – photo compliments of Marylou Rings

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Camelid Iris

- Color dilute animals may have blue or variegated iris color
  - Heterochromia irides

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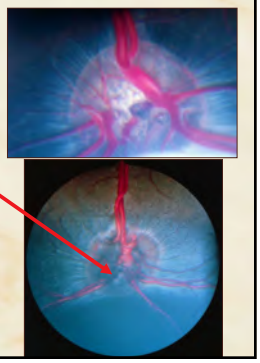
Camelid fundus

- Atapetal
- Oval optic disc
  - Often pigmented
- Long Bergmeister's papilla
  - Gray remnant of the hyaloid artery



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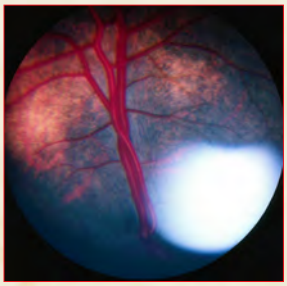
Camelid fundus

- Vitread retinal vessels
- Dorsal vein and arterioles cross



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Ocular Flora

- Similar to cattle, horses, pets
- Primarily gram positive bacteria
  - *Staphyloccus* sp., *Streptococcus* sp., *Bacillus*
- Small quantities of other gram negative bacteria & fungi
  - *Pseudomonas* sp., *Fusarium*, *Aspergillus*
- No mycoplasma isolated in 2 studies

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Ophthalmic Examination

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Vision Testing in Animals

- Observation in stall/pasture
- Menace reflex
  - Positive at 20/400
  - Absent in newborn cria
- Cottonball tracking
- Obstacle course
- Retinoscopy for refractive error
- ERG, Pattern ERG

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Menace Reflex

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Obstacle Course Navigation

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Cottonball Test

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Dazzle Response

- **Subcortical reflex**
- **Bright light induces squinting**
- **Requires minimal functional retina/optic nerve**
- **Present when the optic nerve is intact to the level of the midbrain**

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Pupil Symmetry & Size

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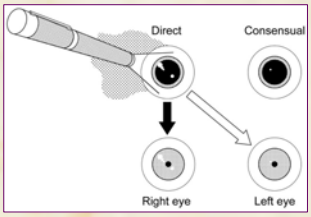
Pupillary Light Reflex

- Stimulate an eye and examine both eyes for response. Repeat on contralateral eye
- Direct PLR = stimulated pupil constricts
- Consensual PLR = contralateral pupil constricts



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Ophthalmic Diagnostic Tests in Camelids

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Schirmer Tear Testing

Normal STT for llamas: 15-19 (x=17) mm/minute

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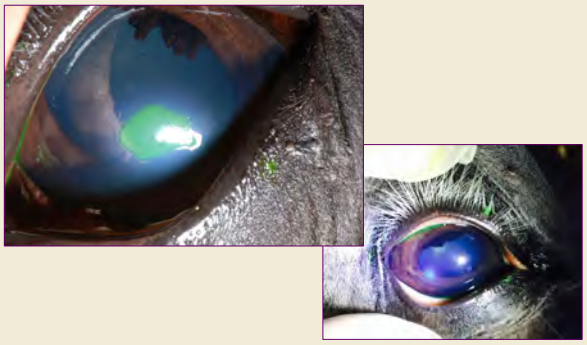
Fluorescein Staining – Used to confirm & delineate area of corneal ulcer



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Fluorescein dye passage (Jones test)

- Apply fluorescein dye
- Watch for dye to appear at nostril
- Appearance of dye confirms patent nasolacrimal system

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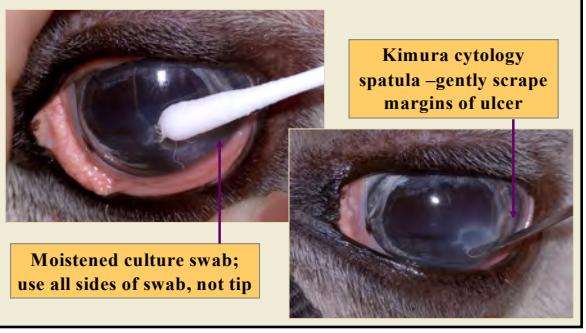
Culture and Cytology



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Conjunctival Brush Cytology

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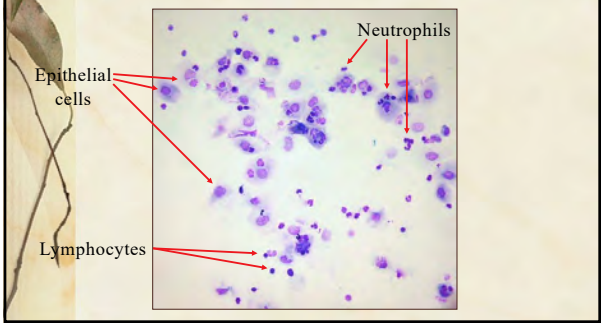
Cytology Diff-Quik: Non-specific conjunctivitis



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Applanation Tonometry

Tono-Pen XL or Tono-Pen Vet

Normal IOP Llamas 7-18 mmHg (x=13)
Alpacas 11-21 mmHg (x=15)

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Rebound Tonometry

TonoVet

Normal IOP ~ 10-25 mmHg

**No topical anesthetic used

**Normal IOP range not known for camelids specifically

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Pharmacologic Pupil Dilation

- Tropicamide 1%
- 1 drop each eye
- Takes 15-20 minutes
- Lasts 3-4 hours
- Provides complete view of lens and fundus

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Ophthalmic Anterior Segment Examination

- **Eyelids/Nictitans**
- **Conjunctiva**
- **Sclera**
- **Cornea**
- **Anterior Chamber**
- **Lens**
- **Anterior vitreous**

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Equipment - Anterior Segment Examination

- Finoff transilluminator
- MagLite
- Magnifying loupes

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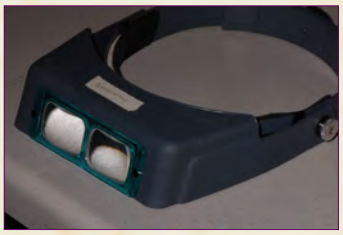
Equipment - Anterior Segment Examination

- Optivisor magnifying loupes



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Equipment - Anterior Segment Examination

- Slit lamps
  - Heine
  - Eidalon
  - Kowa SL-17

Heine Slit Lamp

Eidalon slit lamp

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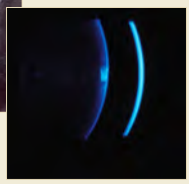
Biomicroscopy/Slit Lamp Exam

Kowa SL-15 Slit Lamp



Provides magnification (10X, 16X), focal illumination & optical section

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Biomicroscopy/Slit Lamp Exam

- Look for depth/location of corneal and lens opacities
- Evaluation for aqueous flare
- Determine depth of corneal ulcers

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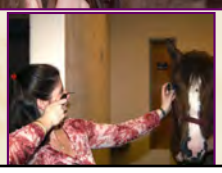
Ophthalmic Posterior Segment Examination

- Retina
- Optic Nerve
- Vitreous
- Direct ophthalmoscopy
- Indirect ophthalmoscopy



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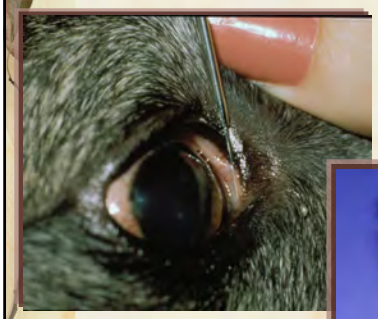
Nasolacrimal Irrigation- Normograde



**For camelids, cannulate ocular puncta with a 3.5 French Tomcat catheter with end cut off

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Nasolacrimal Irrigation- Retrograde

8 French mare urethral catheter inserted into nasal puncta

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Unsuspecting Cute Alpaca...Finding the Nasal Puncta 👀

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Alpaca—Finding the Nasal Puncta

Cute nose!!

Retracting the nostril medially and laterally

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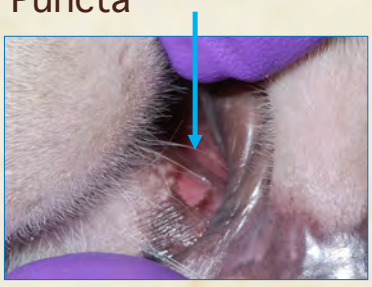
Voila! Alpaca Nasal Puncta



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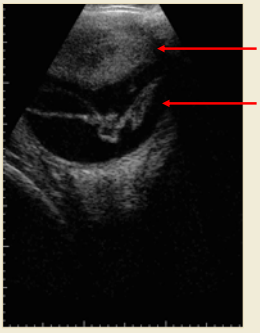
Ocular Ultrasonography 20 MHz

Cataract, retinal detachment



Cataract

Retinal detachment

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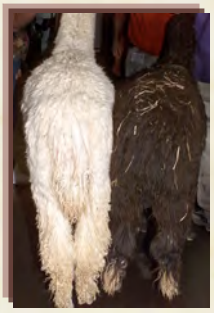
The End…



…QUESTIONS?

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