Highlights on 2018 ECEIM congress Ghent (Belgium)

CENTRE INTERNATIONAL DE SANTÉ DU CHEVAL D'Oniris

Anne Couroucé

DVM, PhD, DipECEIM

Speaker Disclosure

ACVIM FORUM 2019

Highlights on 2018 ECEIM congress

Anne Couroucé

FINAL DISCLOSURE:

I will discuss results of clinical trial which were supported by Pharmaceuticals laboratories

UNLABELED/UNAPPROVED USES DISCLOSURE:

I will discuss results of clinical trial for various agents that are currently NOT approved for use in animals.

INTRODUCTION

- Ghent, Belgium, 9-10th November 2018

- 2 ACVIM residents:
  - Rebecca M. Legere
  - Callum G. Donnelly

- 2 ECEIM residents:
  - Anne Bohlin
  - Tobias Warnken

INTRODUCTION

- Anna Bohlin is a resident in Helsingborg (Sweden), supervised by Gaby van Galen. The work awarded here is titled:
  - ASSESSMENT OF AN AMERICAN NEONATAL FOAL SURVIVAL SCORING SYSTEM IN A DANISH-SWEDISH POPULATION
  - Anna Bohlin[1], Anna Öhman[1], Emma Karlsson[2], Alexandra Sånge[2], Katarina Nostell[3], Inge Durie[4], Louise Husted[5], Claude Saegerman[6], Gaby van Galen[2]

- Tobias Warnken is a resident in Hannover (Germany), supervised by Karsten Feige. The work awarded here is titled:
  - SELECTION OF ASSAY FOR QUANTIFICATION OF EQUINE INSULIN AFFECTS RESULTS OF ORAL GLUCOSE TEST AND COMBINED GLUCOSE-INSULIN TEST IN HORSES
  - T. Warnken[1], M. Schmicke[2], K. Huber[3], K. Feige[1]

CARDIAC RESEARCH

CARDIAC RESEARCH

- Ignacio Corradini, Valencia (Spain)

- Equine cardiac group, Copenhagen (Denmark)
  - Helena Carstensen
  - Rikke Buhl

- Equine Cardio Team, Ghent (Belgium)
  - G. van Steenkiste
  - L. Vera

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Prospective evaluation of the accuracy & diagnostic ability of a smartphone-ECG in horses

I. Corradini, A.Fernandez-Ruiz, J. Engel-Manchado

Departamento de Medicina y Cirugía Animal, Universidad CEU Cardenal Herrera, Valencia, Spain

CEU Universidad Cardenal Herrera

ECEIM CONGRESS Ghent 2018

ECEIM EUROPEAN COLLEGE OF EQUINE INTERNAL MEDICINE

Objectives

To validate a smartphone enabled electrocardiograph (SpECG) comparing it to a standard base-apex ECG (ECG) for the detection of spontaneous arrhythmias in horses

To evaluate the diagnostic ability & accuracy of the SpECG for the measurement of the duration of cardiac electrical events in horses.

Materials & methods

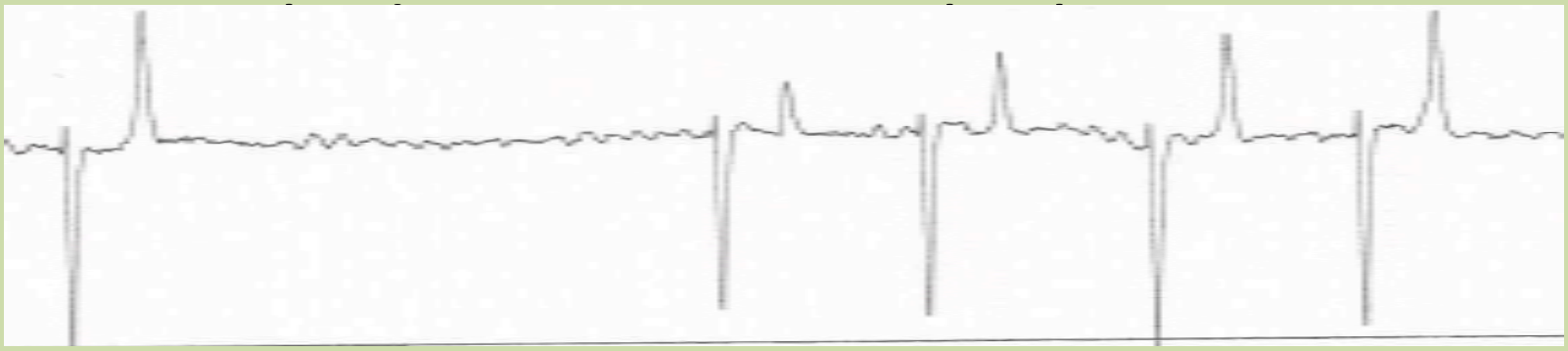
- 1-minute ECG tracings:
  - SpECG & ECG simultaneously
  - SpECG on both sides of the thorax

- Horses with & without spontaneous arrhythmias
- Tracings evaluated by 2 blinded observers
  - Quality & interpretability of recordings
  - Presence & classification of arrhythmias
  - Duration of P-wave, PR-interval, QRS-complex and QT-interval (ms)

Results

- 50 horses 1mo to 32yo were included

ECG



SpECG

Results: agreement between devices

	Overall α [CI_{95}] p	Left side α [CI_{95}] p	Right side α [CI_{95}] p
P wave	*High* *0,70 [-0,12-0,76] <0,00*	*Low* *0,18 [-0,29-0,48] <0,19*	*High* *0,76 [0,64-0,84] <0,00*
PR segment	Very high 0,87 [0,83-0,90] <0,00	Very high 0,89 [0,83-0,93] <0,19	Very high 0,87 [0,80-0,91] <0,00
QRS complex	Low 0,18 [-0,08-0,38] <0,08	High 0,70 [0,35-0,77] <0,00	Low 0,14 [-0,26-0,41] <0,23
QT segment	High 0,70 [0,28-0,74] <0,00	Medium 0,66 [0,20-0,76] <0,00	Medium 0,60 [0,22-0,71] <0,00

Conclusions

SpECG:

- Was a useful arrhythmia-screening tool
- Was accurate
- Better if recorded on both sides of thorax
- Lower wave amplitude
  - SpECG should not replace standard ECG

CARDIAC RESEARCH

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- **Equine cardiac group, Copenhagen (Denmark)**
  - **Helena Carstensen**
  - Rikke Buhl

- Equine Cardio Team, Ghent (Belgium)
  - G. van Steenkiste
  - L. Vera

Structural Remodelling in the Equine Heart after Pacing-Induced Atrial Fibrillation

Helena Carstensen, Eva Zander Hesselkilde, Ditte Dybvald Kruse, Thomas Hartig Braunstein, Thomas Jespersen and Rikke Buhl

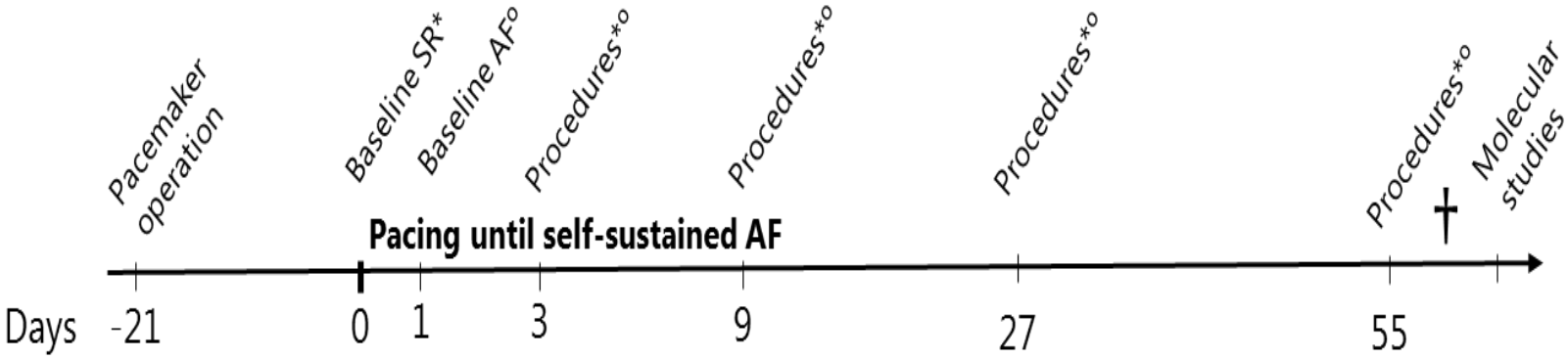
Department of Veterinary Clinical Sciences, Faculty of Health and Medical Sciences, University of Copenhagen.

Aim

To assess structural remodeling of equine heart after AF

- Quantify fibrosis in the atria and ventricles
- Inter-atrial differences

Study outline and methods

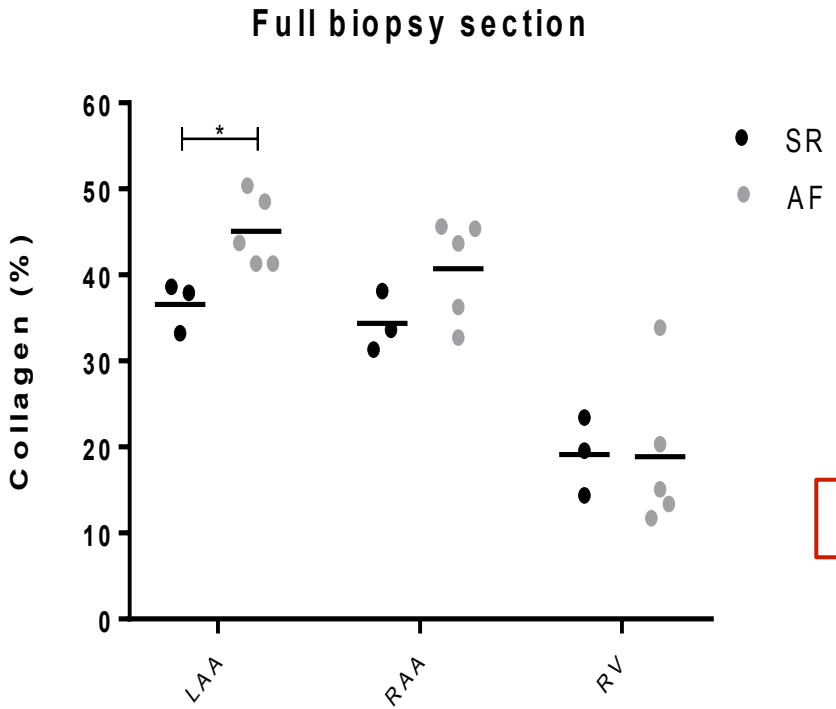


*ECG, echocardiography and flecainide infusion (2mg/kg). AF re-induction if cardioversion
°Atrial fibrillatory rate recordings

- 8 Standardbred mares:
- 5 AF horses, 3 controls
- Age: 10.4±4.7 years, mean body weight 475±47 kg
- Pacemaker implanted w/ two leads in right atrium

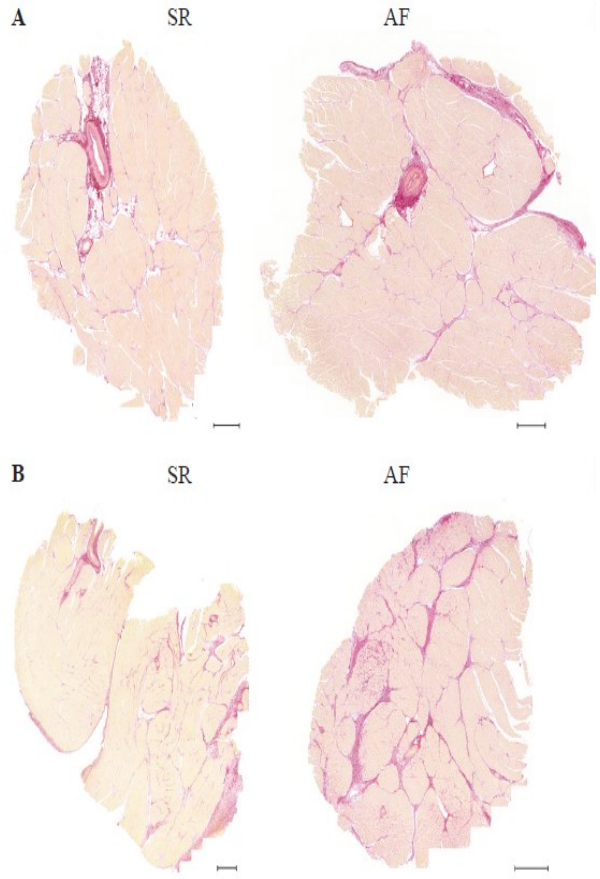
- Histological assessment of fibrosis: Staining with Picro-Sirius Red for collagen (I and III), scanning in brightfield and analysis with ZEN Intellesis segmentation tool

Results - Full biopsy section



LAA

RAA



Conclusions

- Increased amount of fibrosis in the left atrium of the AF group
- A similar tendency in the right atrium of the AF group
- No difference in ventricular fibrosis between AF and control group
- Picro-Sirius red staining combined with ZEN intellesis valid method for fibrosis quantification in horses

✓ AF causes structural remodelling in horse atria

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THE EQUINE CARDIAC GROUP
COPENHAGEN

Implantable loop recorders for arrhythmia detection in horses – a new promising diagnostic tool

Rikke Buhl[a], Eva Z Hesselkilde[a], Helena Carstensen[a], Merle Fenner[a], Thomas Jespersen, Jacob Tfelt-Hansen[b], Stefan M Sattler[b]

[a]Department of Veterinary Clinical Sciences, Faculty of Health and Medical Sciences, University of Copenhagen
[b]Department of Cardiology, The Heart Centre, Copenhagen University Hospital

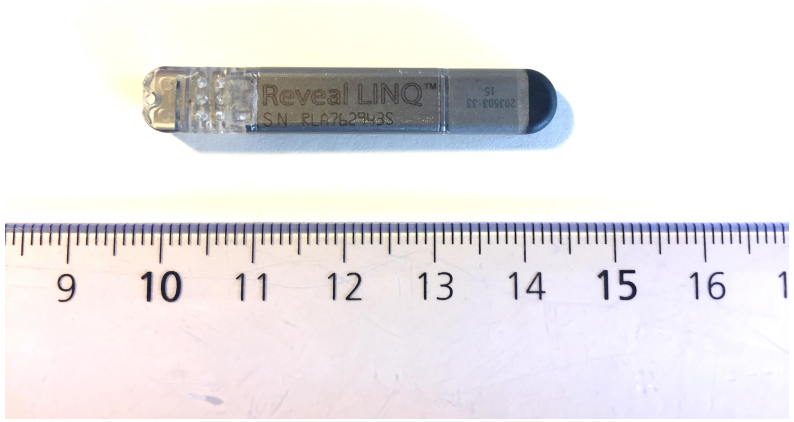
UNIVERSITY OF COPENHAGEN

Challenges

- Short lasting or paroxysmal atrial fibrillation (AF) difficult to diagnose
- Relapse of AF after cardioversion difficult for owner to perceive

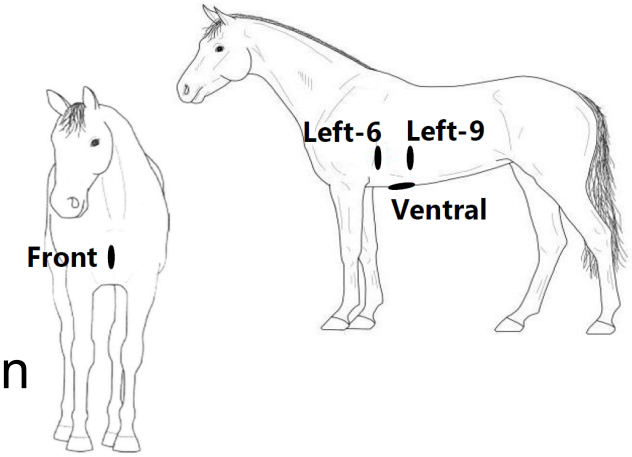
Cardiac Loop Recorder – A one lead ECG implanted subcutaneously

A new way to diagnose AF episodes

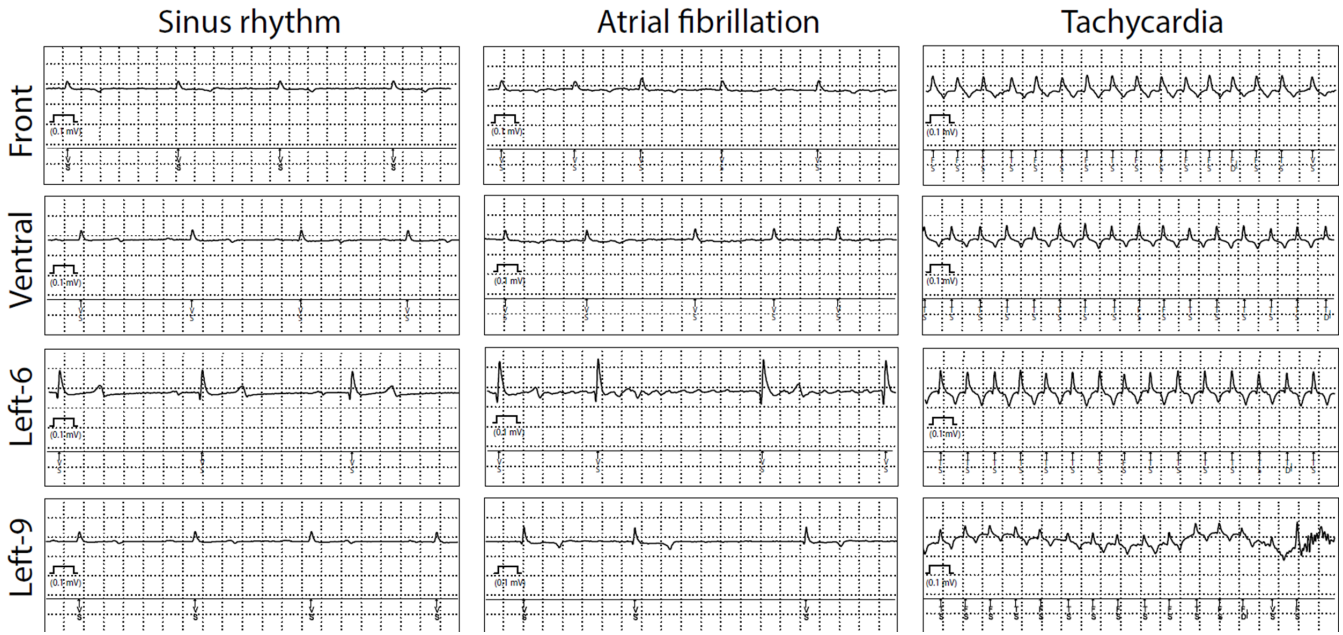


Store automatically predefined arrhythmic events (ie. AF)

Aim of the study



- Is it possible to use Implantable Cardiac Loop Recorder for detection of AF?
- Evaluate best anatomical position for registration of AF in four horses with induced AF



Results and Conclusion

- All Loop Recorders were successfully implanted without complications
- Operation time < 5 minutes
- All Loop Recorders could detect AF
- Left position (Left-6) had significantly higher R and T waves compared to the remaining positions
- Poor quality during exercise

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DEPARTMENT OF LARGE ANIMALS INTERNAL MEDICINE

EQUINE CARDIOTEAM

Research Foundation Flanders
Opening new horizons

FIRST SUCCESSFUL RADIOFREQUENCY ABLATION OF FOCAL ATRIAL TACHYCARDIA IN A HORSE GUIDED BY A HIGH DENSITY 3D ELECTRO-ANATOMICAL MAPPING SYSTEM (RHYTHMIA®)

G. Van Steenkiste[1], M. Duytschaever[2], D. De Clercq[1], R. Tavernier[2], L. Vera[1], A. Michielsen[3], A. Decloedt[1], S. Schauvliege[3], G. van Loon[1]

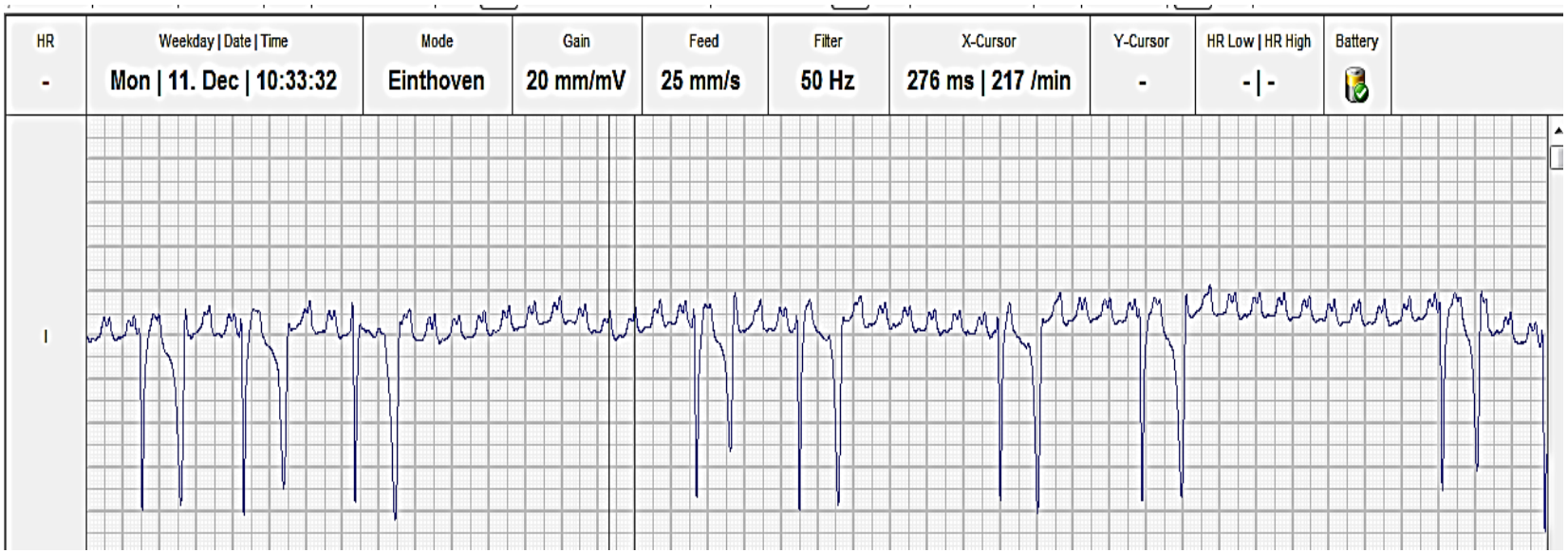
1. Equine Cardioteam, Department of large animal internal medicine, faculty of veterinary medicine, Ghent University, Belgium
2. Department of Cardiology, AZ Sint-Jan, Bruges, Belgium
3. Department of Surgery and anaesthesiology of domestic animals, faculty of veterinary medicine, Ghent University, Belgium

GHENT UNIVERSITY

www.EquineCardioteam.uGent.be

PATIENT

- 5 year old showjumping stallion
- AF has been treated with Quinidine but converted to AT
- Has been cardioconverted to SR 3 times (2 x TVEC, 1 x Quinidine)
- 3 months after last cardioversion: again recurrence of AT



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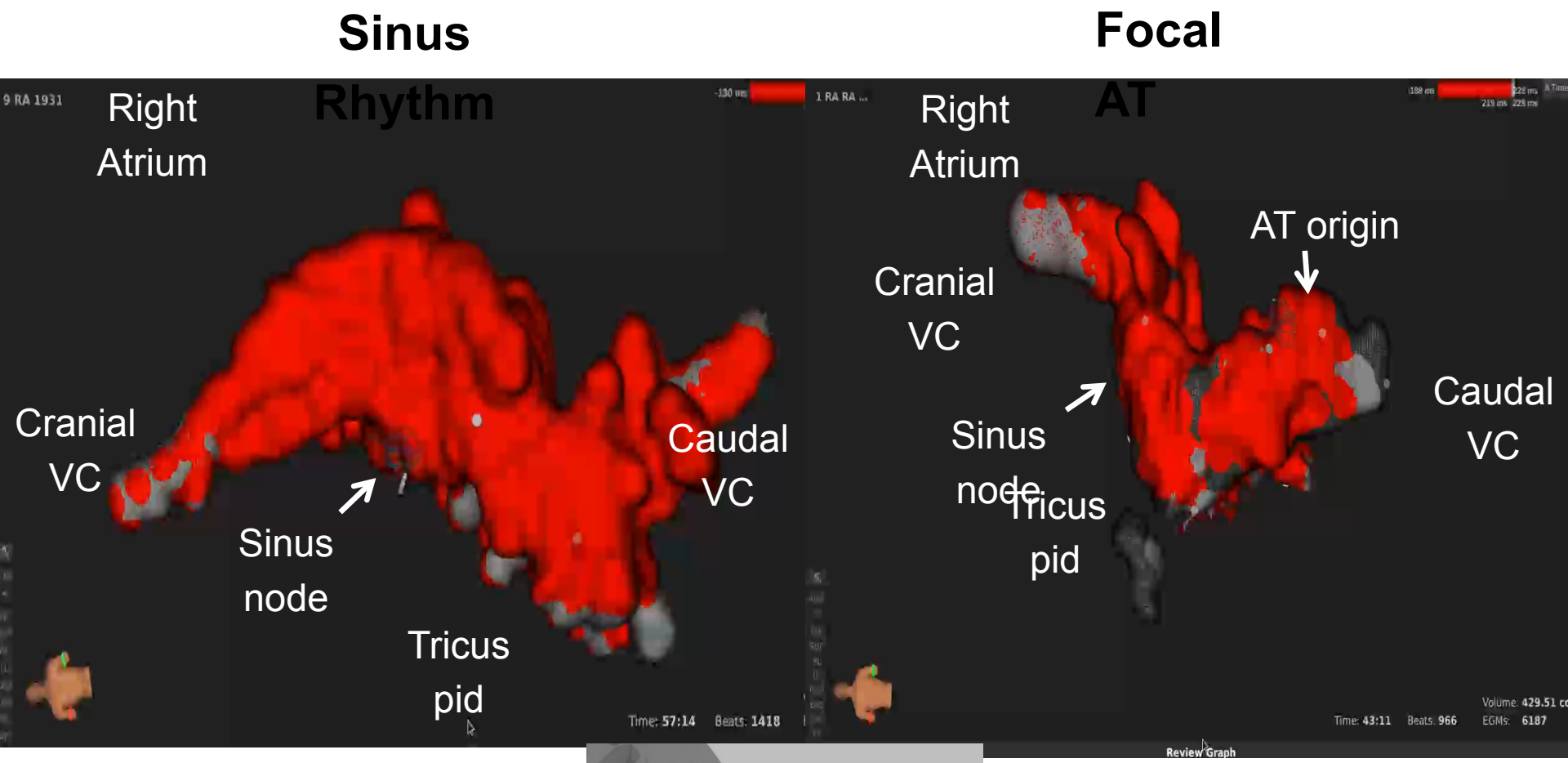
3D ELECTRO-ANATOMICAL MAPPING



(Rhythmia – Boston Scientific)

Left view

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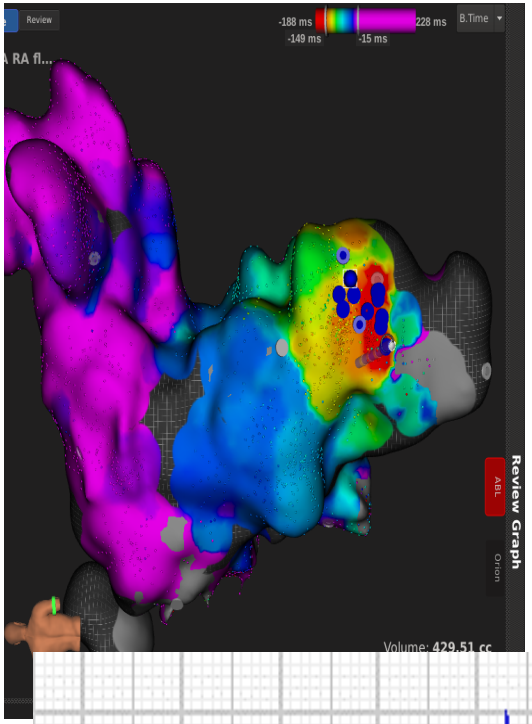
ABLATION

Intellanav OI (boston scientific)



- SR after 5th ablation
- In total 9 ablation locations
- Pacing did not induce AT afterwards

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DISCUSSION

- AT treatment : not well described
  - Usually similar as for AF? (QS or TVEC)
  - Recurrence ?
- Human medicine:
  - High recurrence (99%!)
  - Always ablation: permanent solution
- Current case
  - Focal AT possible source for AF
  - Ablation: possible treatment for some horses with AF?

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CARDIAC RESEARCH

- Ignacio Corradini, Valencia (Spain)
- Ingunn Risnes Hellings, Oslo (Norway)
- Equine cardiac group, Copenhagen (Denmark)
  - Helena Carstensen
  - Rikke Buhl
- **Equine Cardio Team, Ghent (Belgium)**
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DEPARTMENT LARGE ANIMAL INTERNAL MEDICINE
RESEARCH GROUP EQUINE CARDIOLOGY

Research Foundation Flanders
Opening new horizons

RIGHT ATRIAL RELATED STRUCTURES IN HORSES, OF INTEREST DURING ELECTROPHYSIOLOGICAL STUDIES

L. Vera, D. De Clercq, G. Van Steenkiste, A. Decloedt, B. Deserranno, G. van Loon

Equine Cardioteam, Department of Large Animal Internal Medicine, Faculty of Veterinary Medicine,
Ghent University, Belgium.

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www.EquineCardioteam.uGent.be

AIM

- ❑ Catheter-based electrophysiological studies
  - → diagnose and treat specific cardiac arrhythmias in horses
- ❑ To develop and standardise
  - → detailed anatomical knowledge is necessary

➔ Investigate important right atrial related structures

MATERIALS AND METHODS

15 Warmblood horses

- ❑ Measurements: *post mortem*
- ❑ Mean (±SD) body weight = 539(±74) kg
- ❑ Mean cardiac weight was 4.2(±0.8) kg

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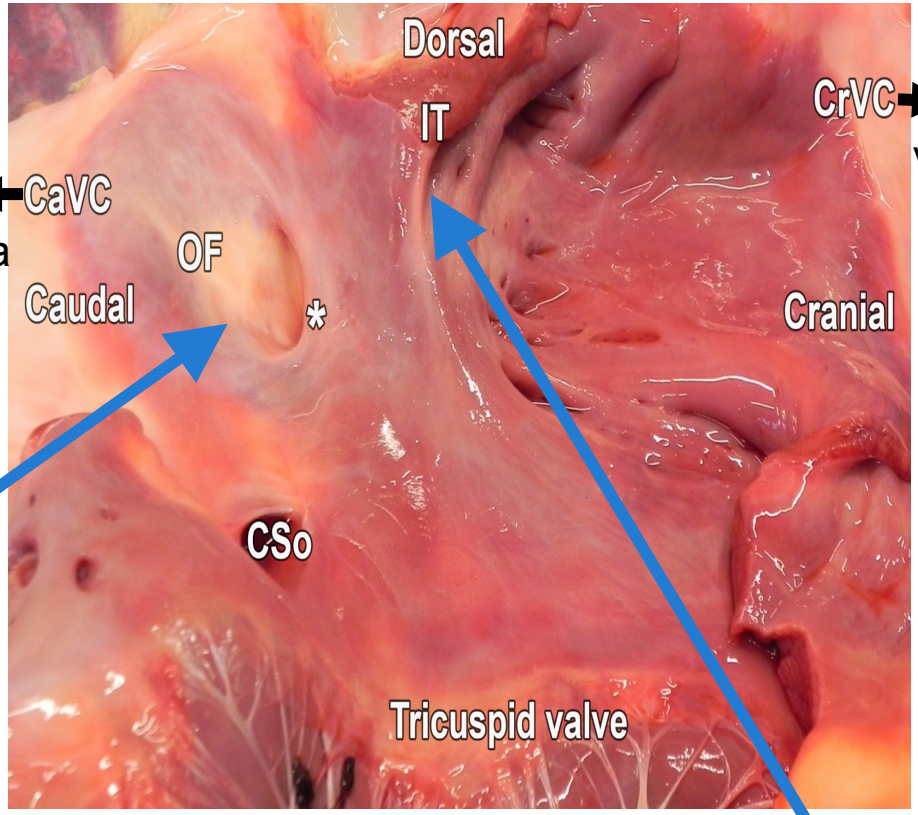
RESULTS



Oval fossa (OF)

Transseptal puncture

→ Gain access to LA and LV via a RA approach.

- Size: 29(±3) mm x 59(±9) mm

Intervenous tubercle (IT)

A large, prominent structure

→ Might hamper catheter positioning

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RESULTS

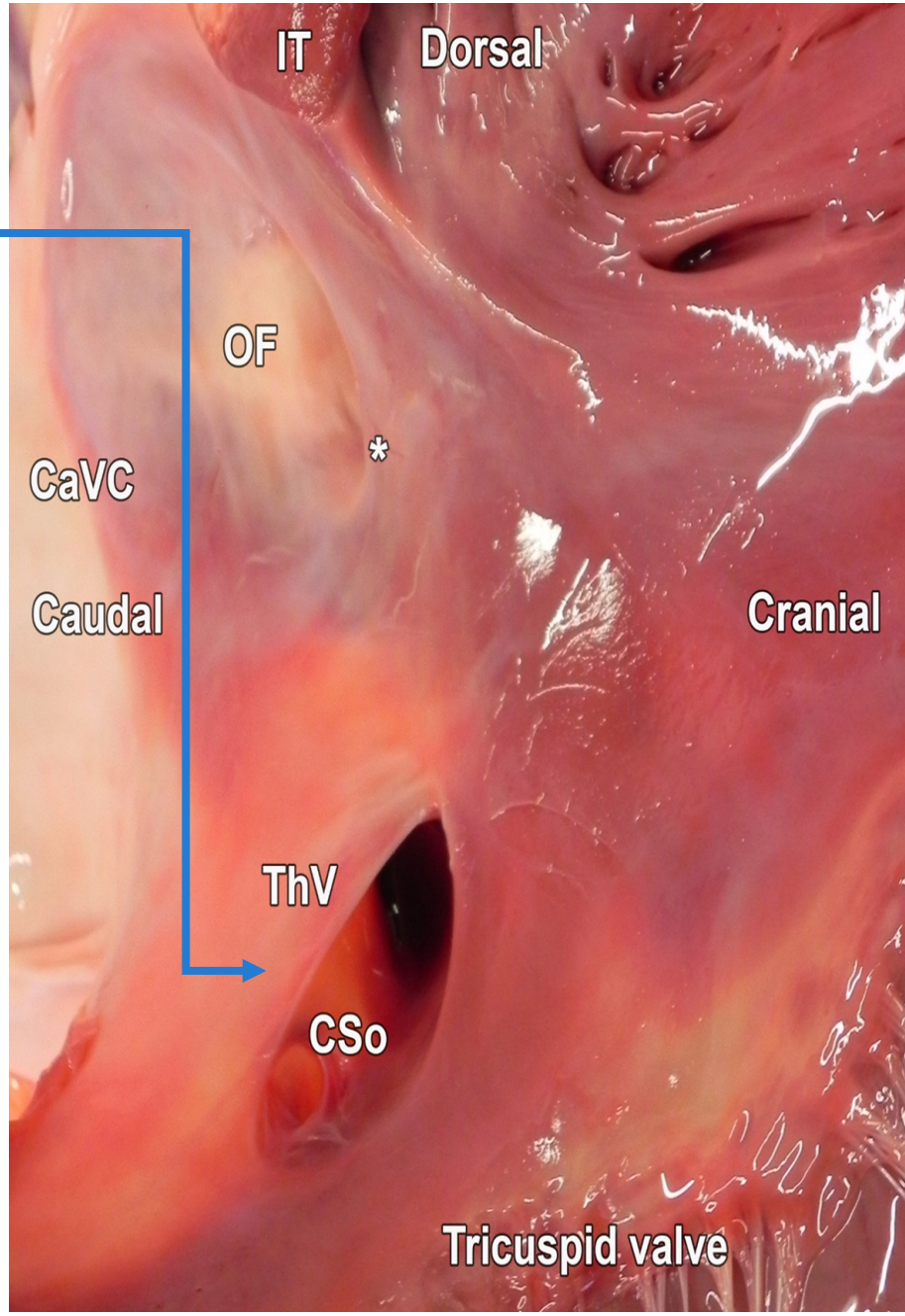
Coronary Sinus

Catheterisation of **CS** and **great cardiac vein (GCV)** → electrical information about LA and LV via a RA approach

- ❑ Size **CS ostium (CSo)**: 28(±3) mm

→ Presence of (Thebesian) valve in 3 horses

→ Median of 5 additional valves in GCV



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CONCLUSION

- **Large size of intervenous tubercle** → likely to **hamper transseptal puncture** through the oval fossa via a cranial vena cava approach

- Presence of a **valve at the entrance of the coronary sinus** in some horses, and especially the **large number of additional valves** over the entire length of the great cardiac vein in all horses → **difficult catheterise CS and GCV**

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CARDIO-VASCULAR RESEARCH

CATHETER-RELATED VENOUS DISEASE IN HORSES: INCIDENCE, RISK FACTORS AND BACTERIAL CORRELATION

Petr, Soukup[1], Barbora Bezděková[2]

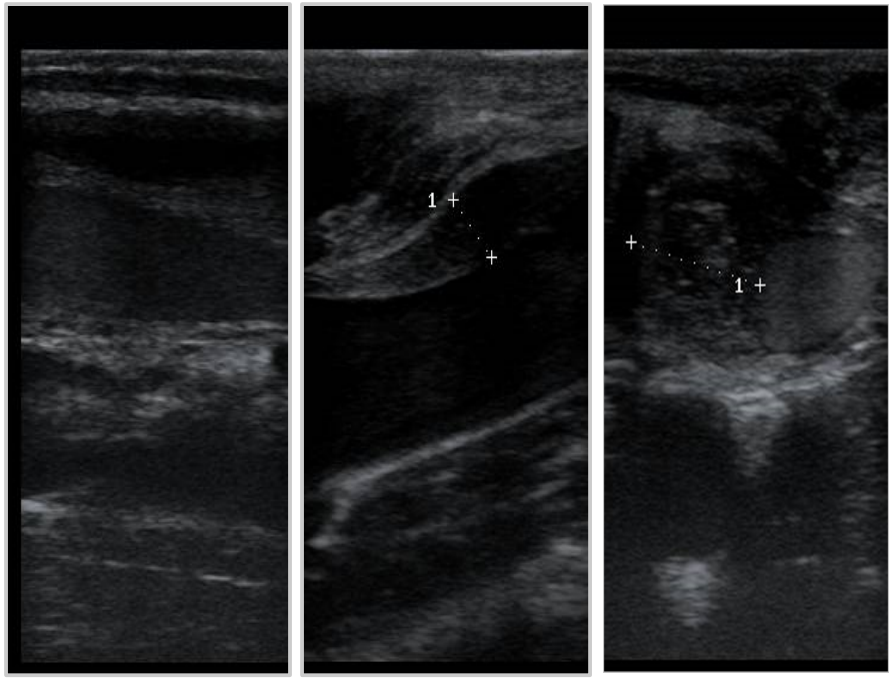
[1]*Equine Clinic, University of Veterinary and Pharmaceutical Sciences Brno, Czech Republic*

[1]*Equine Department, Section of Ophthalmology, Vetsuisse Faculty, University of Zurich, Switzerland*

[2]*EQUINE MEDICAL, Jabloňany 77, 679 01, Skalice nad Svitavou, Czech Republic*

Aim of the study

- To determine incidence of catheter-related venous disease, i.e. phlebitis, periphlebitis, thrombophlebitis, and evaluated risk factors associated with this disease in long-term intravenously catheterized horses



Three examples of v.jugularis pathology on horizontal and transversal views

Material and methods

- 125 cases of catheterized veins from 117 patients were repeatedly evaluated clinically and ultrasonographically for signs of subclinical or clinical catheter- related venous disease.
- Possible risk factors and medical records data were evaluated.
- 92 catheter tips were aseptically removed and bacteriologically diagnosed.
- Antimicrobial sensitivity testing for all bacterial isolates was performed.

Results

- 16 veins suffered from clinical disease and 16 veins from subclinical progressive disease, incidence of clinically relevant catheter-related disease was 25,6% (32/125). 29,6% presented with subclinical non-progressive disease

- Risk factors associated with clinically relevant disease included endotoxemia, thrombocytopenia and colic as presenting sign (all $P<0,01$)

Results

- 40 catheter tips yielded a positive culture results (43,5%) and clinically- relevant disease had significantly more positive cultures ($P<0,01$)

- Most common isolates included coagulase-negative *Staphylococcus* (16) and *E. coli* (9)

- *Enterobacteriaceae* ($P<0,01$), *E. coli* ($P<0,05$) and coagulase-positive *Staphylococci* ($P<0,05$) were found to be significantly more present in clinically relevant disease

- Seventeen multiresistant bacterial strains were isolated

Conclusion

- Significant risk factors (endotoxemia, thrombocytopenia and colic) could be used as indications for preventive ultrasonographic evaluation to decrease the rate of clinical disease and prevent possibly fatal complications.

- Multiresistant isolates stress the need to culture tips from diseased veins and could be used to determine first choice antimicrobial before the culture sensitivity results are available.

RESPIRATORY RESEARCH

RESPIRATORY

- V. Potts et al., Edinburgh (Scotland)
- C. Paindaveine et al., Liège (Belgium)

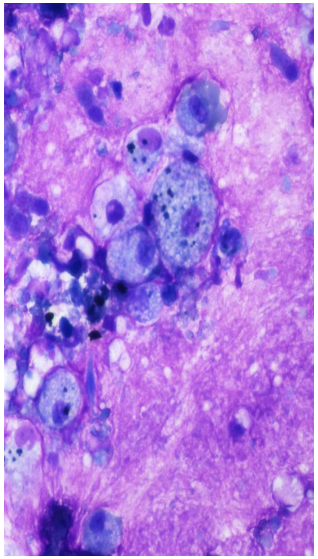
RESPIRATORY

- **V. Potts et al., Edinburgh (Scotland)**

- C. Paindaveine et al., Liège (Belgium)

Dithiothreitol: Effect on interpretation of equine tracheal wash samples

Valerie Potts BVMS MRCVS, Royal (Dick) School of Veterinary Studies, University of Edinburgh



Background

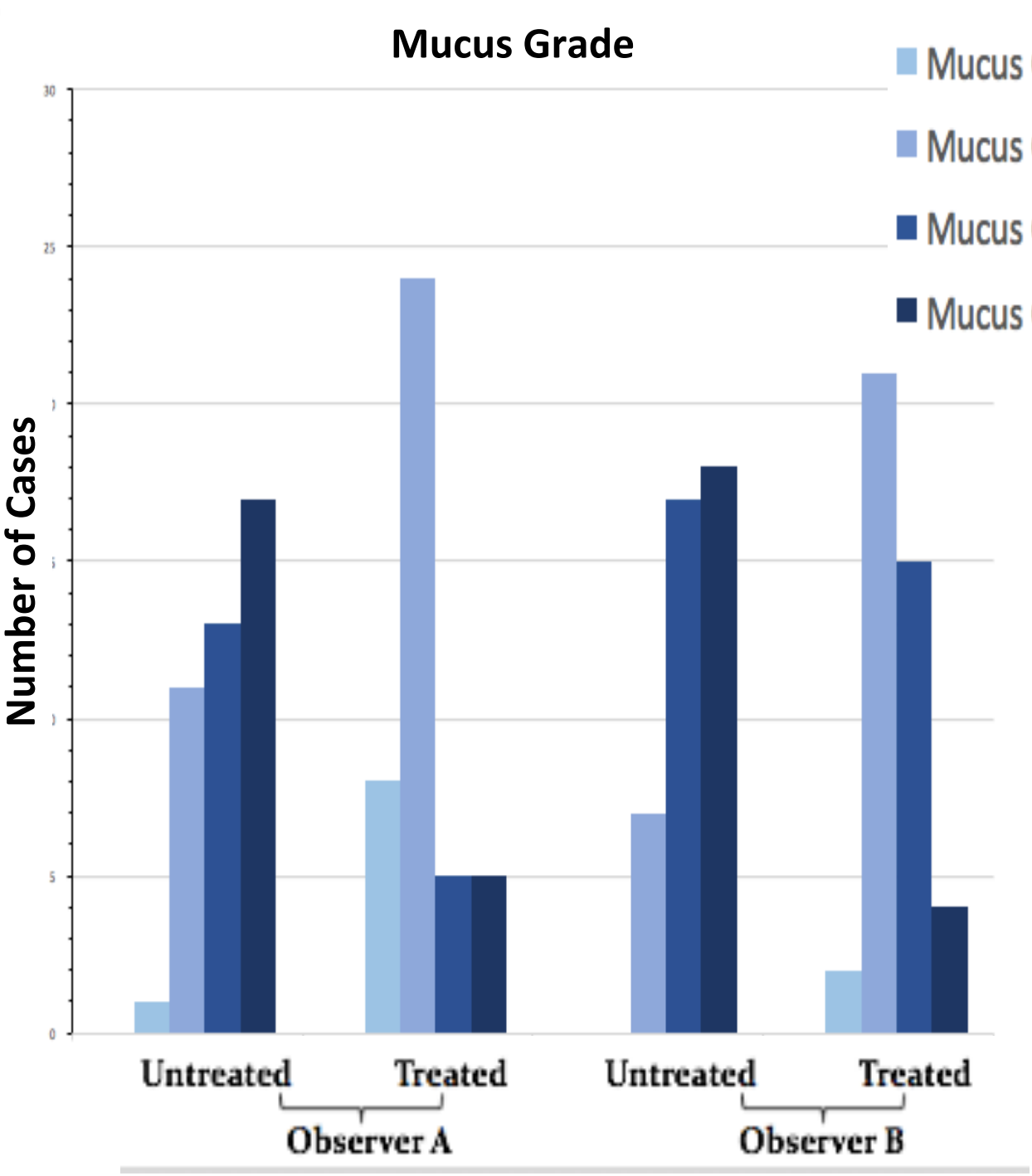
- Cytological interpretation of tracheal wash (TW) samples can be impeded by excess mucus
- Dithiothreitol (DTT) is a potent mucolytic used in the processing of human sputum samples

Hypothesis: Treatment of TW samples with DTT will:

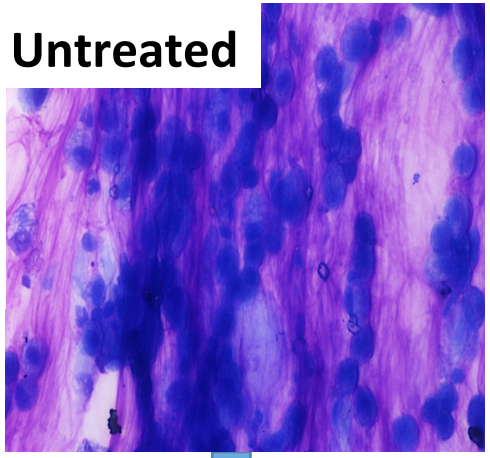
- Reduce background mucus on stained cytology slides
- Improve the "readability" of the sample
- Facilitate the recognition of cells preferentially trapped within the mucus, thus potentially influencing the differential cell count

Methodology

- 45 equine paired TW samples - 1 treated (DTT) & 1 untreated
- 2 blinded observers analysed tracheal wash cytology and mucus grade on slide

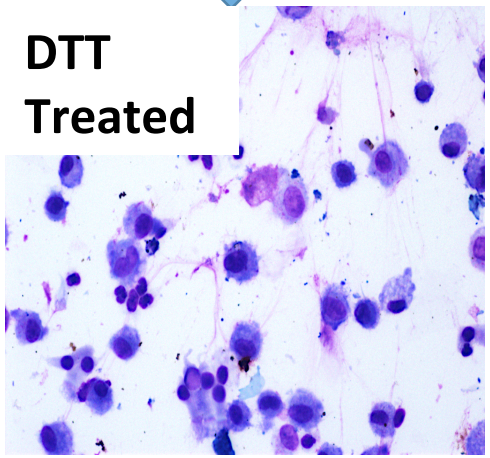


Untreated



Same Sample

DTT Treated



Effect on differential cell count – influencing inter-observer agreement and disease categorization

	Untreated		DTT treated	
	Observer A	Observer B	Observer A	Observer B
< 20% neutrophils	39	32	34	31
> 20% neutrophils	6	13	11	14

Intraclass correlation coefficient

Untreated - 0.61

DTT treated - 0.75

Conclusions

DTT

1. Significantly ($P<0.001$) reduced mucus grade for both observers

2. Significantly improved inter-observer agreement, with regard to neutrophil %

3. Did not significantly alter neutrophil percentages

4. Did not significantly alter disease categorization
   - Non significant trend – requires larger study

RESPIRATORY

- V. Potts et al., Edinburgh (Scotland)
- **C. Paindaveine et al., Liège (Belgium)**

IN VITRO BACTERICIDAL EFFECT OF NEBULIZED SILVER ON TWO EQUINE COMMON RESPIRATORY BACTERIA

C. PAINDAVEINE, T. FRIPPIAT, J-N. DUPREZ, J. MAINIL, T. ART

Background

- Respiratory bacterial infections: gram-positive (mainly streptococci) and gram-negative (mainly *Actinobacillus/Pasteurella* spp.), possibly treated with systemic or aerosolized antibiotics
- Increasing antimicrobial resistance in bacteria
- **Silver:**
  - Antimicrobial action against gram-positive and gram-negative, viruses and fungi
  - Currently used in surgical sutures, wound dressings and medical devices

Aim of the study

1. to demonstrate the in vitro antimicrobial effect of silver on 2 common equine respiratory bacteria, *S. zooepidemicus* and *A. equuli*
2. the preservation of its in vitro antimicrobial effect after nebulization

Bacterial growth inhibition

- BHI/Columbia blood agar plate inoculated with bacteria, CFU after 24 hours incubation 37°C
- **Part 1 - Instillation:** 1 mL of silver complex (2000 and 100 ppm) or citric acid (chelator)
- **Part 2 - nebulization at 15 cm of the plates:** 2,5 mL of silver complex (2000, 1000, 500 and 100 ppm)
- Gentamicin (control +) or saline (control -) spread on plate

Part 1 - Instillation

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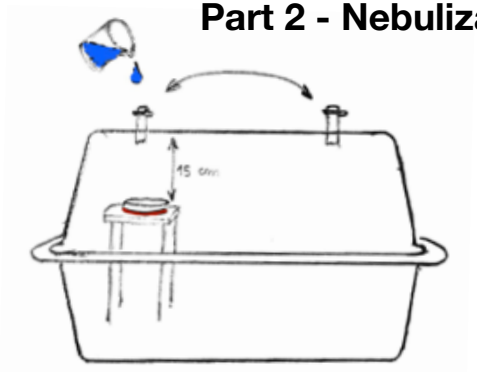
Part 2 - Nebulization



Impossible d'afficher l'image. Votre ordinateur manque peut-être de mémoire pour ouvrir l'image ou l'image est endommagée. Redémarrez l'ordinateur, puis ouvrez à nouveau le fichier. Si le x rouge est toujours affiché, vous devrez peut-être supprimer l'image avant de la réinsérer.

Discussion and conclusions

Results of the study

- In vitro antimicrobial effect on *S. zooepidemicus* and *A. equuli* after nebulization

Limitations/bias

- Effect of airways' anatomy, airflow, mucus and epithelial cells
- Potential toxicity on horse's respiratory cells and effect of long-term use on airway
- Uncommon silver-resistance bacteria described

Further studies

- Biocidal effects on viruses and fungi
- Cytotoxicity of silver citrate on equine respiratory epithelial cells
- In vivo studies: antimicrobial effects of silver citrate and side effects on airways

BIOMARKER RESEARCH

NGAL: A new biomarker for renal injury & inflammation

van Galen G., Jacobsen S. Vinther A. M., Breinholt Laurberg M., Tvermose E., Broe - Brøndum R., Prior Theisen L., Berg L.

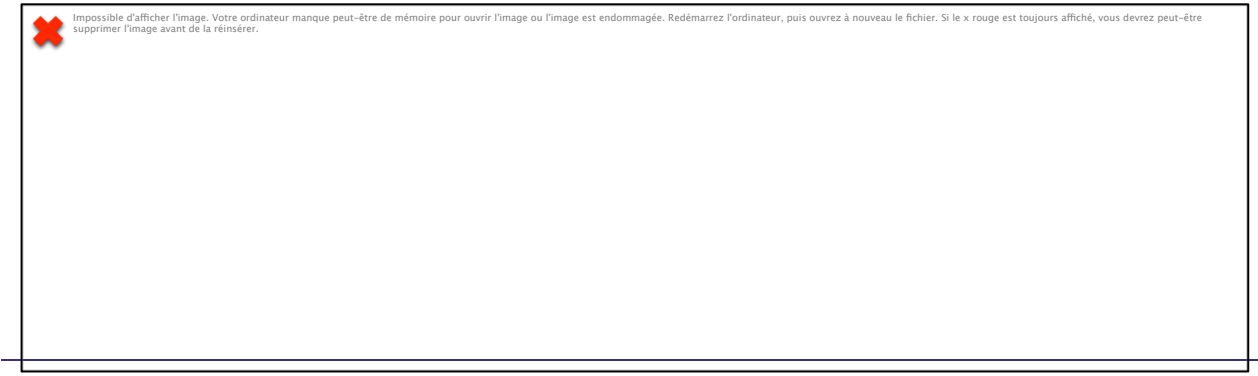
Large Animal Teaching Hospital, University of Copenhagen, Denmark
(current address: Sydney University, Australia)

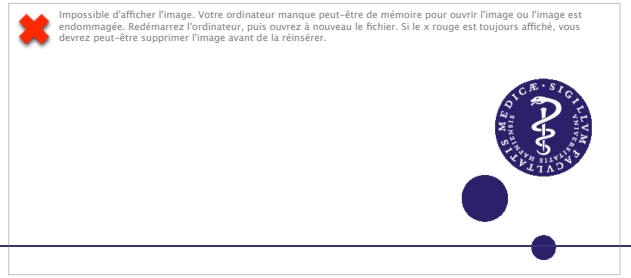
Neutrophil gelatinase-associated lipocalin (NGAL)

- Structural marker for renal damage
- Added diagnostic value humans/dogs / cats
- Also linked to inflammation
- AKI and inflammation go often hand in hand

Objective:

Determine if and how NGAL increases following different local and systemical inflammatory conditions, with and without renal problems





Study 1 - LPS

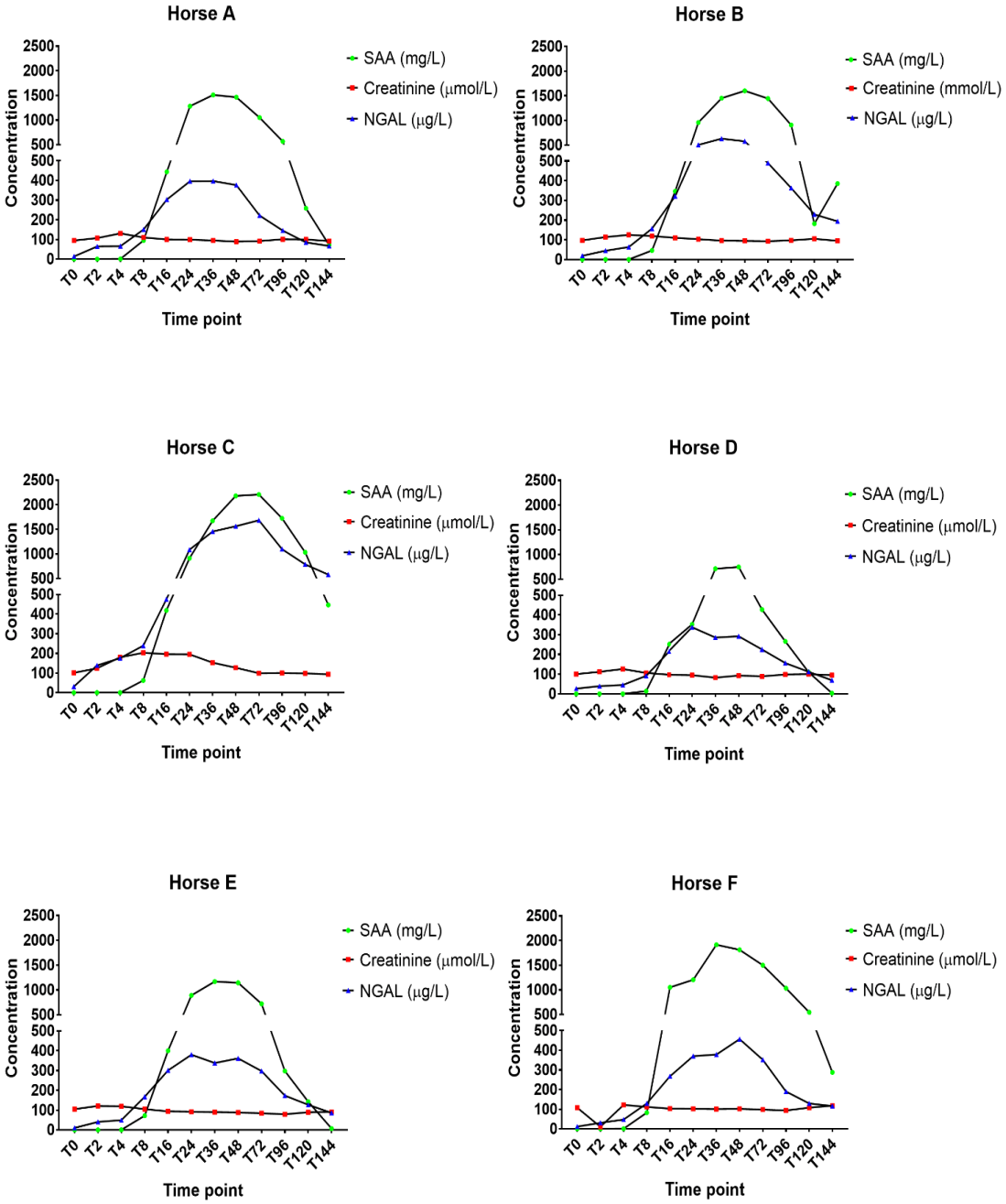
Stored samples previous study
6 healthy horses
1ug/kg LPS IV

NGAL follows curve of SAA

- Low baseline
- Mild increase in 0-4H, then steep increase
- Peak at 24-48H (earlier than SAA)

Horse C has AKI : NGAL higher

-> identifies inflammation but also AKI



Study 2 - Castration

Previous study – stored samples

8 healthy horses undergoing castration

Postsurgical inflammation:

NGAL :peak day 1

Back to baseline day 2-3

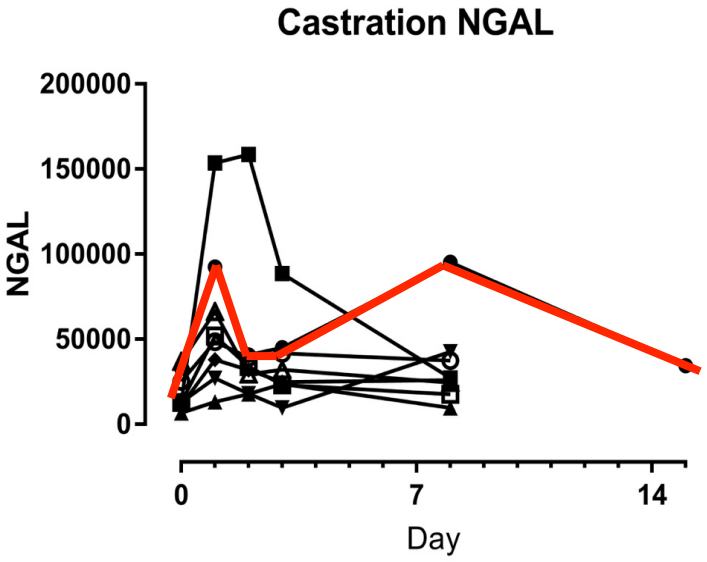
Quicker than SAA

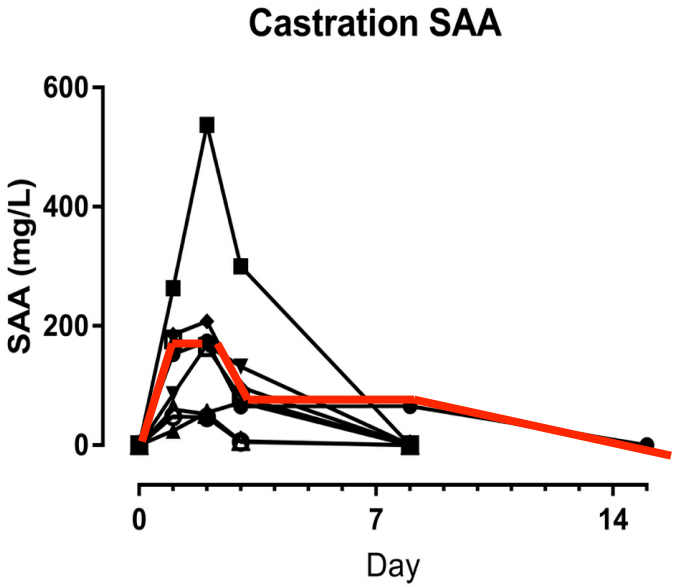
Postsurgical complication:

(horse with red line)

NGAL: separate peak and more reactive than SAA

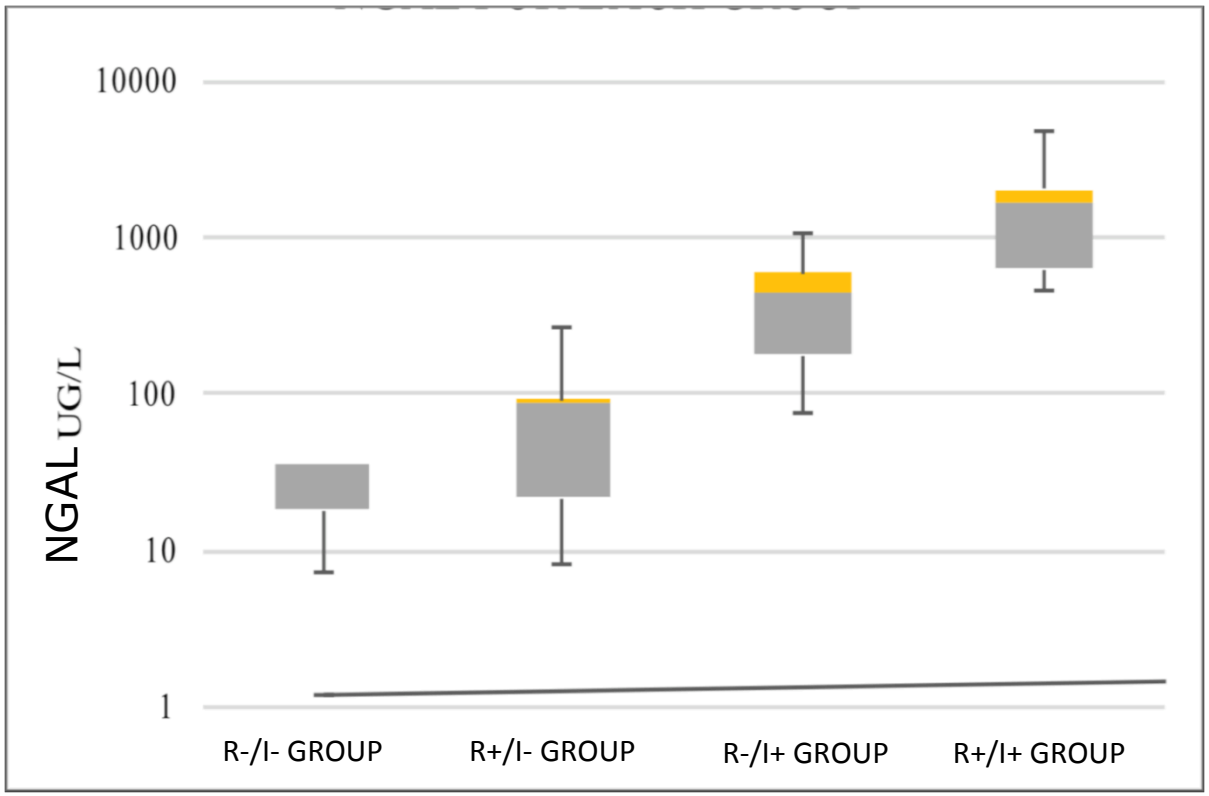
-> potentially more useful to monitor post-operative patients than SAA

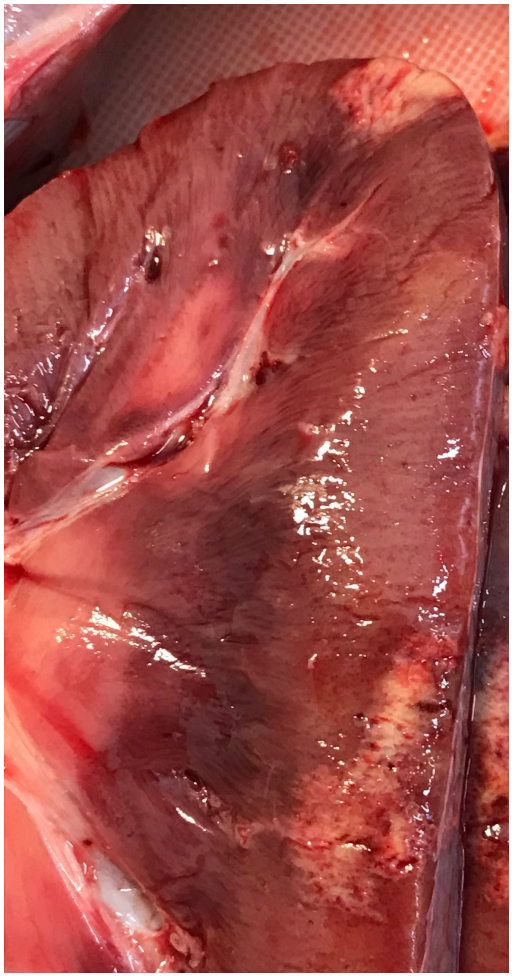




Study 3 – Overlap inflammation (I) & renal (R)

Frozen serum samples of all admissions
Retrospective case selection – 4 groups





Statistical difference between all groups, except R-/I- *vs* R+/I-
-> level of increase is indicative of type of lesion

Conclusion

- ✓ NGAL shows promising features as a new biomarker for renal issues and inflammation in the horse
- ✓ NGAL gives an indication of whether there is inflammation and/or renal damage
- ✓ A more clinically available diagnostic test is needed to enhance its cinical applicability

GASTRO-ENTEROLOGY RESEARCH

Gastro-enterology

- **Marco Duz**
  - Big data, large colon impaction and seasonality

- **Monica Venner**
  - Effects of omeprazole and a commercial dietary supplement on the gastric mucosa in weanling foals

- **Tanguy Hermange**
  - Transabdominal ultrasonography in healthy small equids species: establishement if standards and comparison with the horse

University of Nottingham
UK | CHINA | MALAYSIA

ECEIM

Big data, large colon impactions & seasonality

Katy Grosvenor BVS

Marco Duz MedVet MVM(Res)DipECEIM PhD FHEA MRCVS

marco.duz@nottingham.ac.uk

Data Origin: north America

- Retrospective study using EMRs
- 1 PMS provider
- 12 practices (3x1stop, 6x1stop+ref),
- 35 branches (29 USA, 6 Canada)
- 533 (144 current) Vets − 2132 vet-years
- Mixture FO/REF, racetrack and pleasure etc
- Jan 2006 − June 2017

Validated text-mining methodology: sensitivity and specificity ~99%

439,762 equids (horses, donkey, mules and zebras)
162,500 horses with >1 year clinical record
778,382 horse-years

Colic and LCI incidence (2006-2017)

35,406 colic episodes - 29,913 equids (8.1%; 95%CIs:8.0-8.1%)

4452 LCI episodes – 4187 equids (12.6%; 95%CIs:12.2-12.9%)

Episodes	Colic (%)	LCI
1	26,082 (87.2%)	3954 (94.4%)
2	2782 (9.3%)	206 (4.9%)
3	687 (2.3%)	23 (0.5%)
4	217 (0.7%)	3 (0.1%)
5	81 (0.3%)	1 (0.1%)
>5	64 (0.2%)	0

90-days colic-free cut-off

Results

Colic

- Less frequent in winter
- Dip in prevalence in spring reflection of greater overall caseload in that season

LCI

- Most common in Autumn (Nov-Dec)
- Occurrence decreases gradually through winter towards spring
- Peak in occurrence in August

University of Nottingham
UK | CHINA | MALAYSIA

Conclusion

- ✓ Big data from a large equine population can be used to evaluate seasonal occurrence of colic and LCIs
- ✓ Future studies should evaluate specific season related variables to inform improved prevention
- ✓ The study shows that LCIs are more common during certain times of the year and therefore owners and horse carers should be particularly vigilant during these times to prevent disease occurence

Member of the EBVS
EUROPEAN COLLEGE OF EQUINE INTERNAL MEDICINE
ECEIM

Gastro-enterology

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- **Tanguy Hermange**
  - Transabdominal ultrasonography in healthy small equids species: establishement if standards and comparison with the horse

[1]Equine Clinic, Destedt, Germany

[2]Vet. Clinic, Gessertshausen, Germany

[3]Institute of Animal Nutrition, Nutrition Diseases and Dietetics,
Faculty of Veterinary Medicine, University of Leipzig, Germany

Effects of omeprazole and a commercial dietary supplement on the gastric mucosa in weanling foals

[1] Monica Venner, DVM, PhD, Dipl.ECEIM

[2] Bettina Liebscher, DVM

[3] Ingrid Vervuert, DVM, Dr. Habil.

Questions

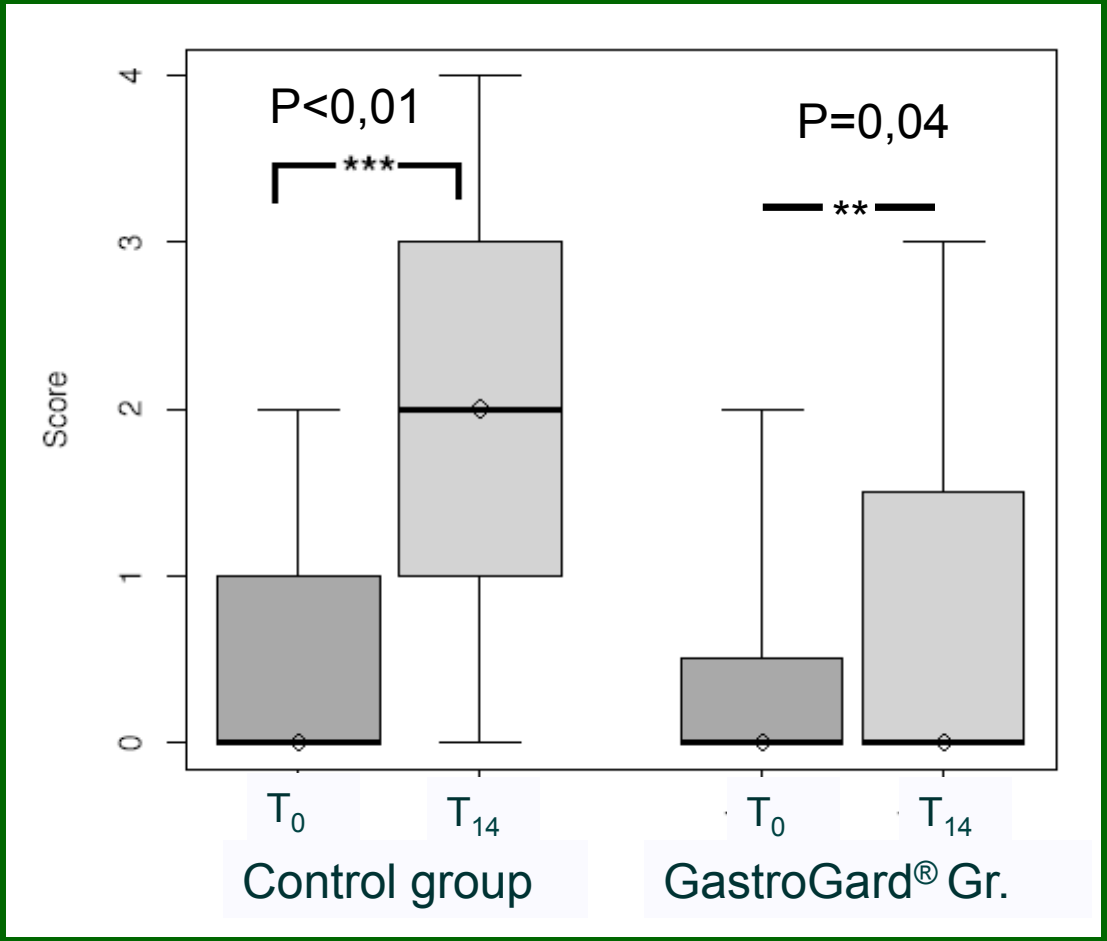
- Do foals show gastric ulcers around the weaning ?
- Does treatment with Gastrogard® decrease gastric lesions in foals after weaning ?
- Does feeding with a yeast enriched supplement EQI®Gastro decrease gastric lesions in foals after weaning ?

Trial 1: Study design

- 2 groups of 20 foals:
  - GastroGard® group: day 1 - 14, 2 mg/kg p.o. s.i.d.
  - Controls without therapy
- Feeding: hay / oats / sojbean meal / minerals + vitamins
- Gastroscopy *(examiner blinded to group assignment)*:
  - 1 day prior to weaning
  - 14 days post weaning

1. Trial : Results - Gastroscopy

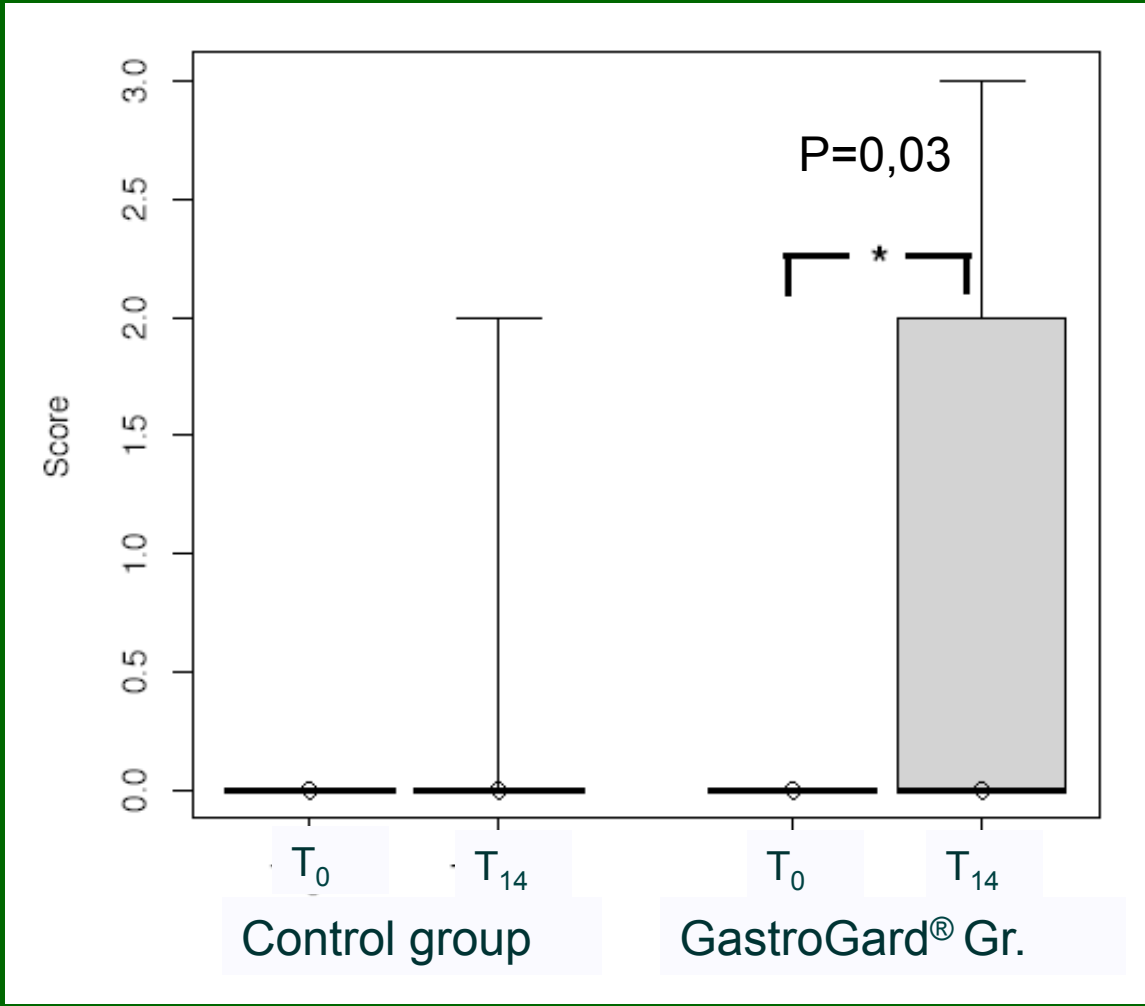
Score:
squamous region



Dahlkamp et al. Pferdeheilkunde 2012

1. Trial : Results - Gastroscopy

Score: Pylorus



Dahlkamp et al. Pferdeheilkunde 2012

2. Trial : Study design

- 3 groups: 62 foals (5 - 6 months of age)
  1) Supplementation with EQI®Gastro (n = 21)
  2) Treatment with GastroGard® (n = 21)
  3) Controls (n = 20)

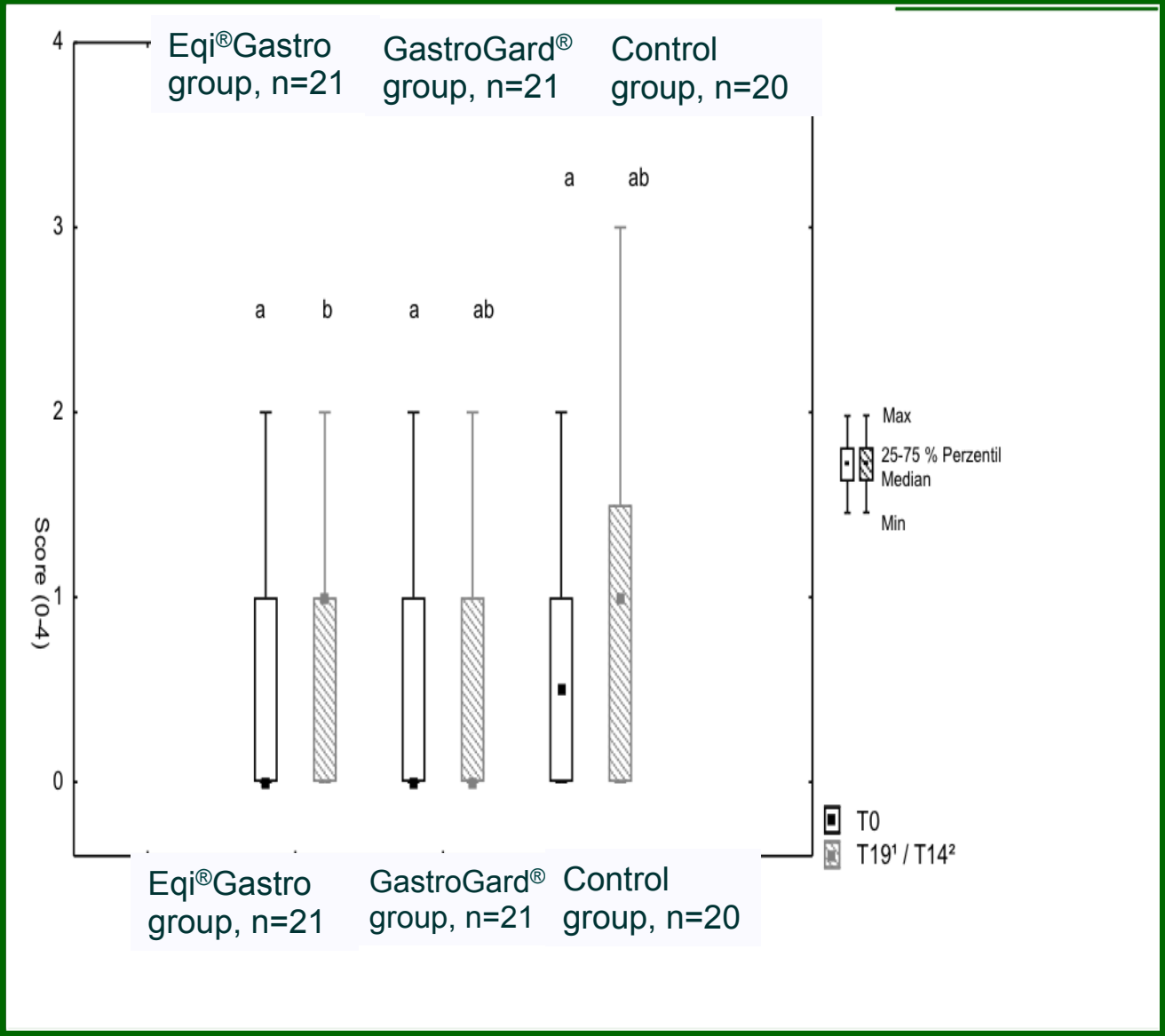
- Treatment / Supplementation :
  EQI® Gastro: 19 days bid
  GastroGard®: 14 days sid, 2 mg/kg BW

- Feeding method:
  in the trough, in a soaked compound feed

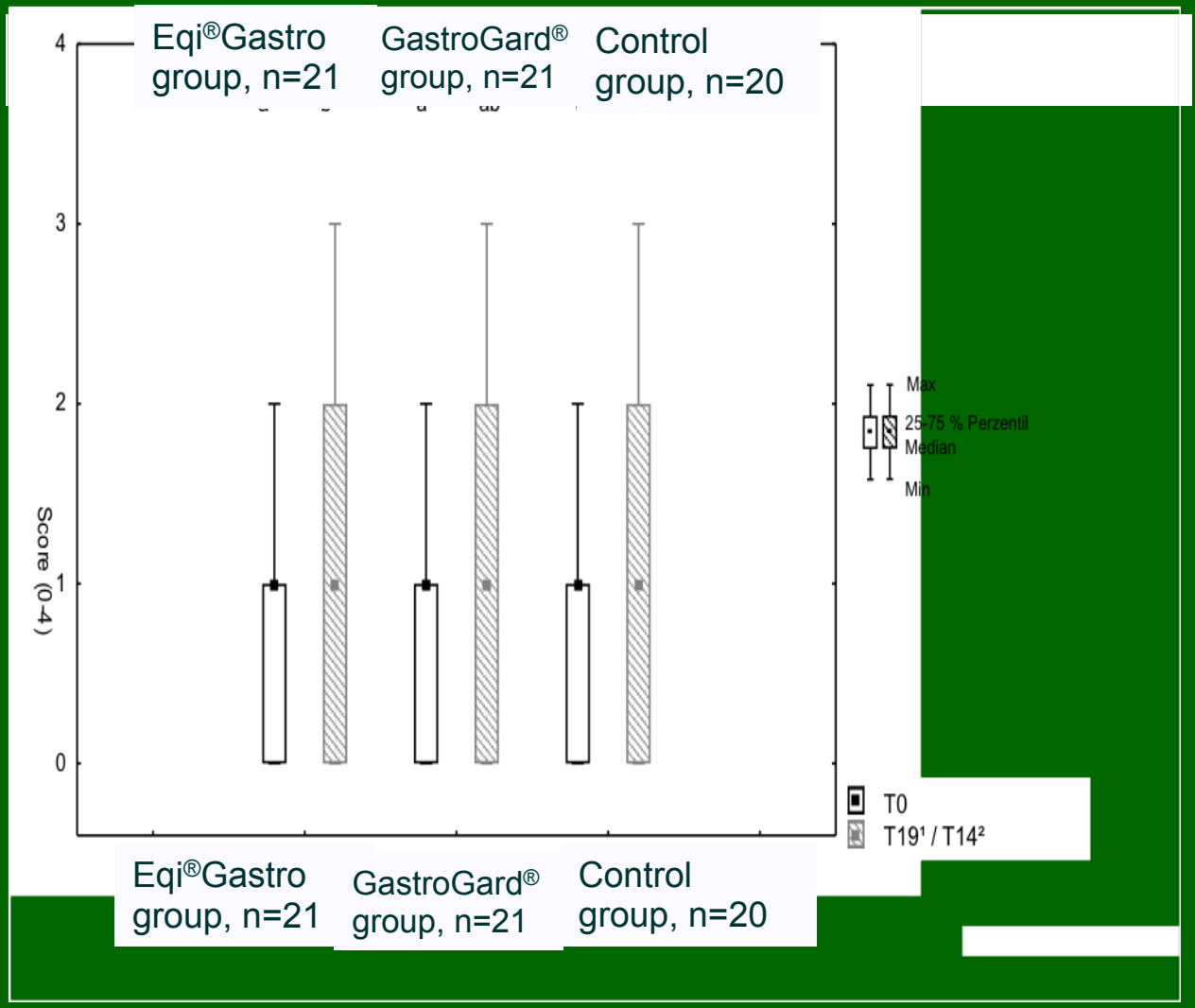
Background to the yeast enriched supplement

- *Saccharomyces cerevisiae*
- Pectin provided as aple pulp
- Algae
- Wheat bran
- Linseed

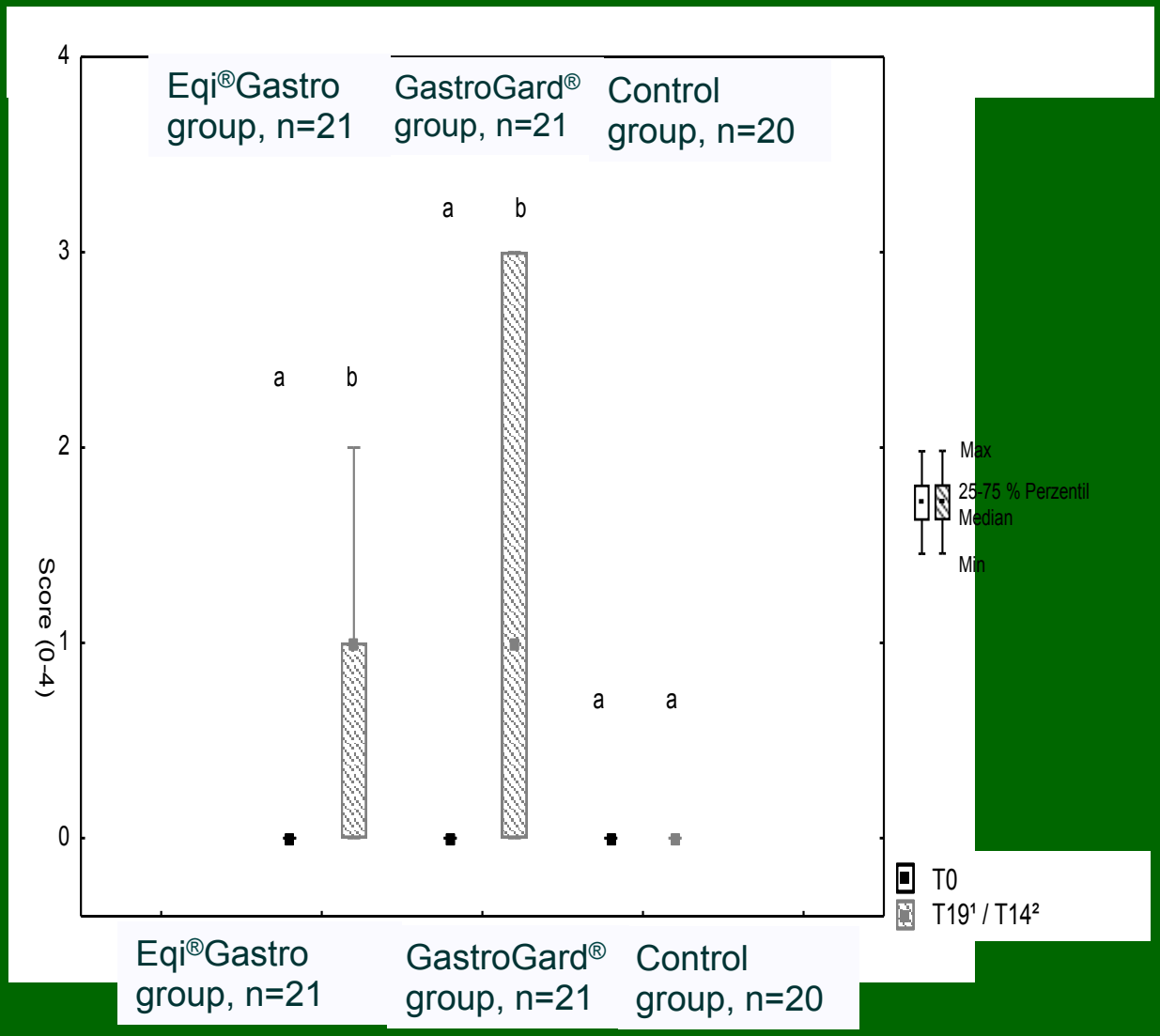
Part 2: squamous region - Larger curvature



Part 2: squamous region - small curvature



Part 2: Pylorus



Questions and answers

- Foals show gastric ulcers before and after weaning

- Does treatment with Gastrogard® decrease gastric lesions in foals after weaning ?
  - Yes in the squamous region (1. trial)
  - 2 studies → signs of inflammation at the pylorus

- Does feeding with a yeast-enriched supplement decrease gastric lesions in foals after weaning ?
  - Neither in the squamous nor in glandular region

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  - Transabdominal ultrasonography in healthy small equids species: establishement if standards and comparison with the horse

Transabdominal ultrasonography in healthy small equids species: establishement if standards and comparison with the horse

81

Noémie PAILLE[1], Tanguy HERMANGE[1], Anne COUROUCE[1]

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France

INTRODUCTION

- Abominal ultrasound: routine exam
- Numerous indications: colics (acute and chronic), weight loss, diarrhea, …
- Gives a lot of information
- Interpretation based on reference images and values

Few informations on abdominal ultrasound images in small equids

AIMS

Establish transabdominal ultrasonographic standards in small equine species

Compare images and data with horses

MATERIALS AND METHODS

- Population: 46 equids

		Horses	Ponies B/C	Shetlands	Donkeys	Miniatures
N		10	9	8	9	10
Sex	Female	10	4	3	4	4
	Male	0	5	5	5	6
Age (yo)		4 to 16	6 to 22	3 to 18	1 to 17	1.5 to 15
Height (cm)		148 to 181	118 to 139	88 to 102	88 to 130	83 to 92
Weight (kg)		454 to 617	230 to 414	105 to 225	100 to 260	68 to 113
Body score (/5)		2 to 4	2 to 4	2.5 to 4.5	3 to 4.5	2.5 to 3.5

RESULTS: STOMACH

85

Mean caudal limit (ICS)

Donkey
14.89

Shetla
14.75±1.28

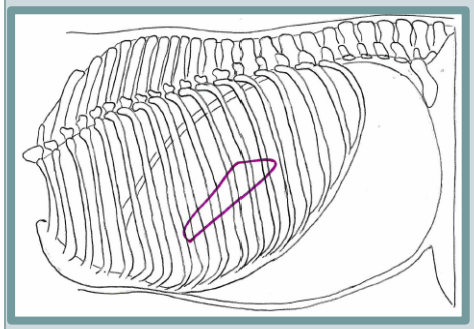
Mean dorsal limit

Donkey

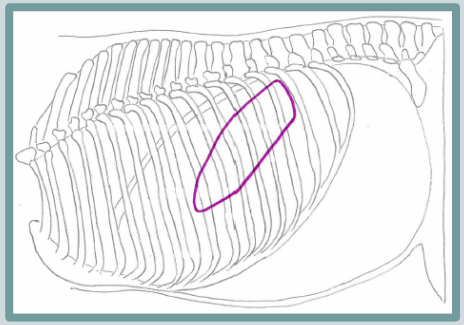
Horse
chiatic
erosity

coxae

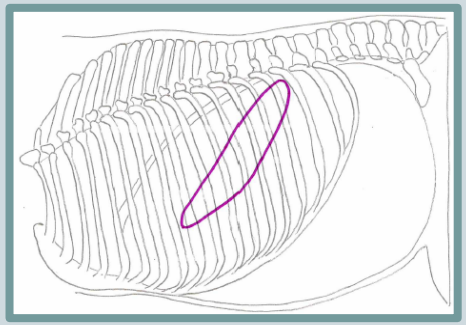
Mean projection area of the stomach:
Donkey, Shetland, Miniature > Horse



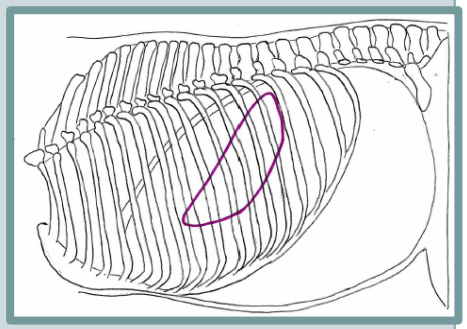
Horse



Donkey



Shetland



Miniature

RESULTS: STOMACH

Mean wall thickness (cm)

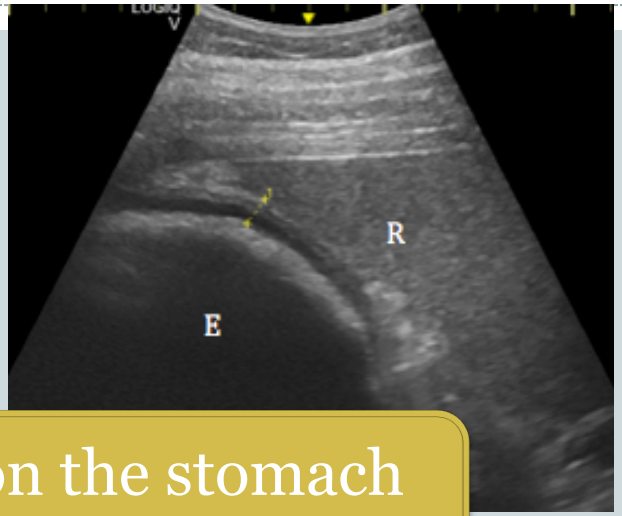
Donkey
0.46

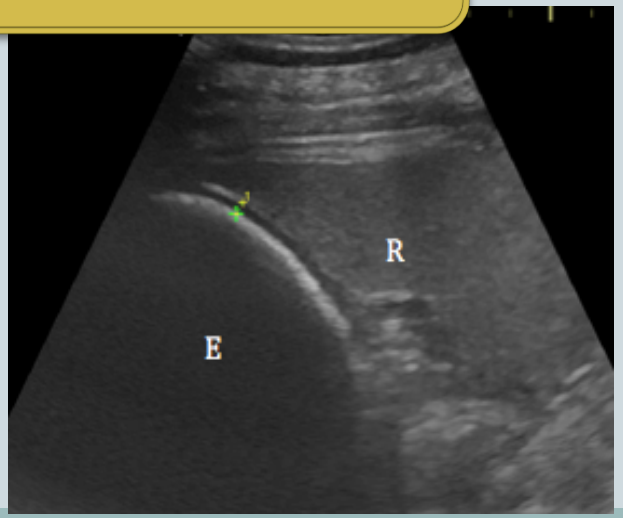
Shetland
0.47±0.12

Horse
0.65±0.20

Miniature
0.39±0.09

Effet of the size of the animal on the stomach wall thickness

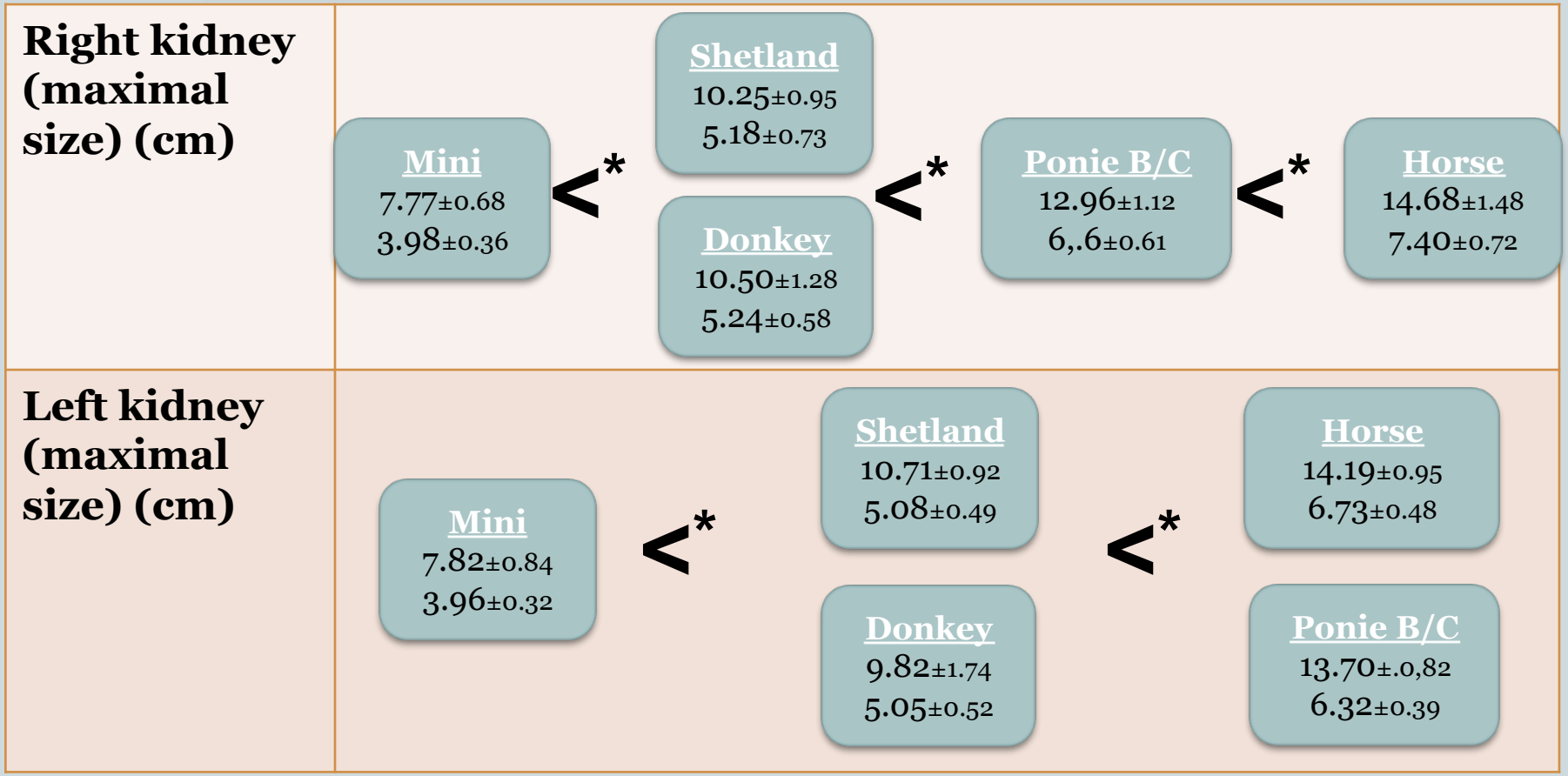




Miniature

RESULTS: KIDNEYS

Effect of the animal size on the kidneys' size



RESULTS: SPLEEN

Mean caudal limit

Horse > Donkey

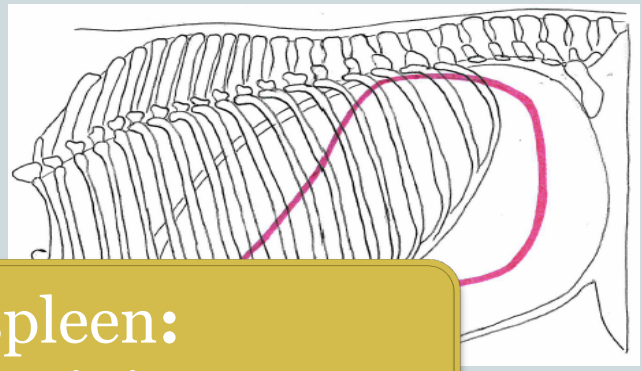
Projection area of the spleen:
Horse > Donkey, Shetland, Miniature

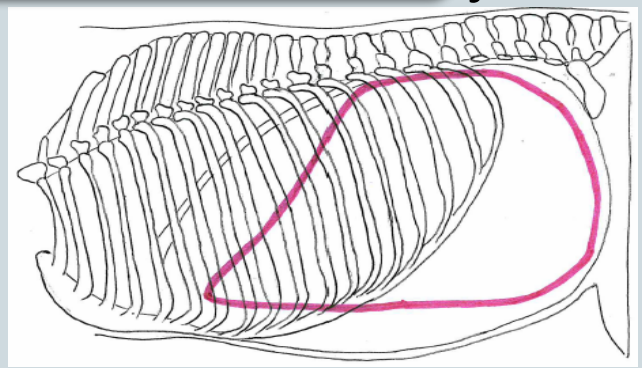
Mean cranial limit (ICS)

Donkey
7.67±1.50
Miniature
7.30±0.82

> *

Horse
5.80±0.63





Horse

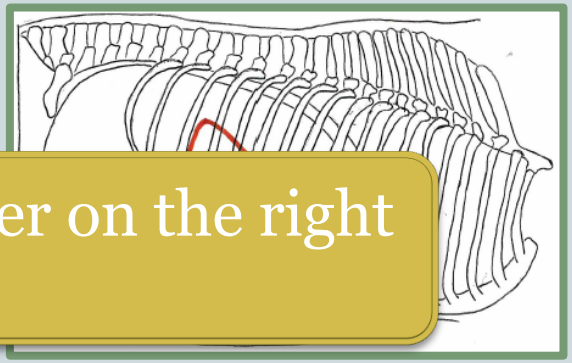
RESULTS: LIVER (RIGHT)

Mean cranial limit (ICS)

Hors

10.20±

Mean projection araea for the liver on the right
Donkey > Horse



Horse

Mean caudal limit (ICS) and dorsal limit
Mean number of ICS

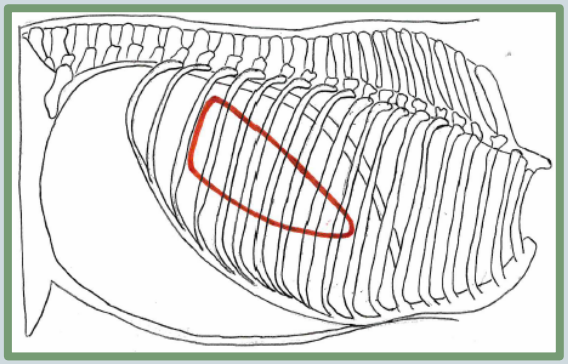
Donkey

15.44±0.53
Middle *tuber coxae*
8.22±0.97

>*

Horse

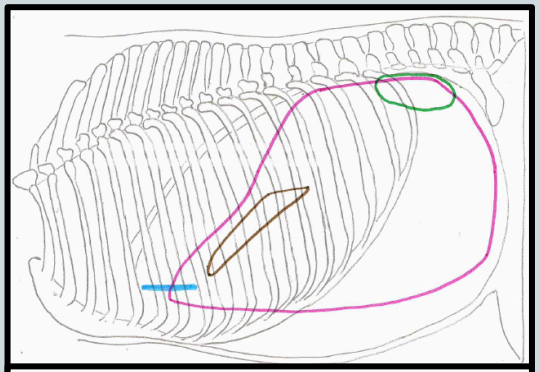
14.90±0.32
Under *tuber coxae*
5.70±1.83



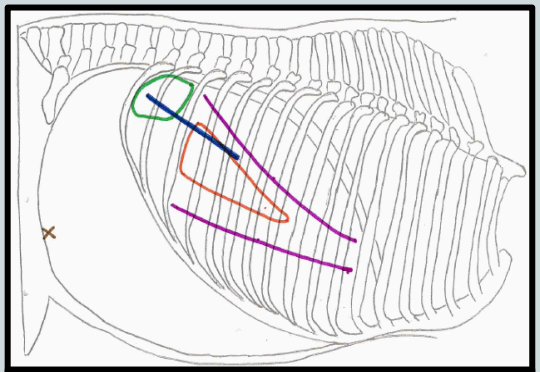
Donkey

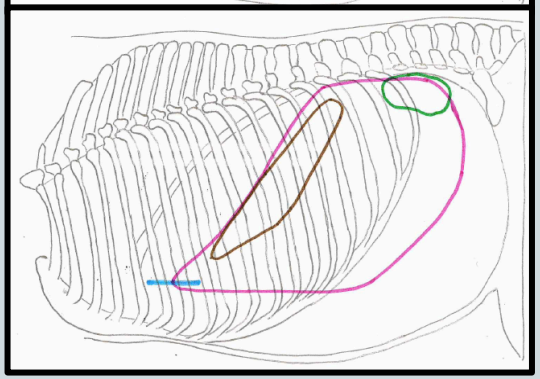
RESULTS

90

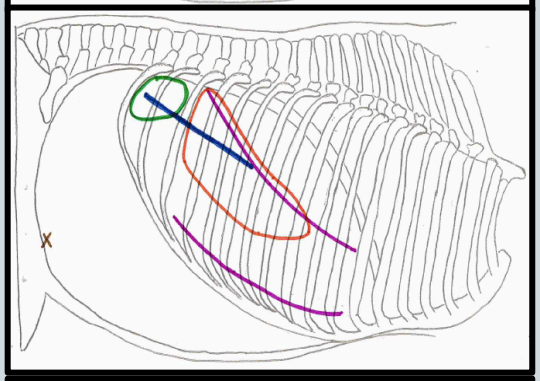


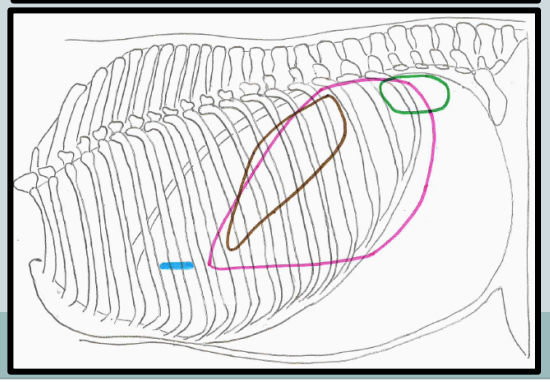
Horse



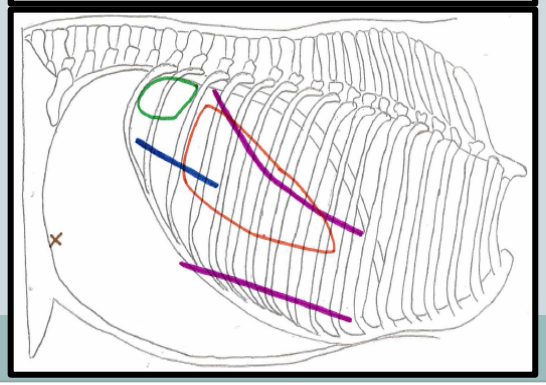


Shetland





Donkey



CONCLUSION

- These results suggest that transabdominal ultrasonographic standards differ significantly between horses and small equids. These differences should be taken into account for an accurate diagnosis.

THANKS FOR YOUR ATTENTION