



Federal Rural University of Pernambuco

Veterinary Medicine

CAPES/PrInt - UFRPE

Strategic planning and actions

2021-2022

Programa de Internacionalização

CAPES/PrInt



Veterinary Medicine (since 1978)



Level 5 - CAPES

Faculty: 20

MD students: 35

PhD students: 65

Coordinator: Prof. Joaquim Evêncio Neto

Website: www.pgvvet.ufrpe.br

E-mails: coordenacao.pgv@ufrpe.br

•Research Areas:

1. Clinic and Animal Surgery
2. Animal Reproduction
3. Preventive Veterinary Medicine

General research lines

1. Clinical and Surgical Evaluation and Repair of Animal Diseases
2. Biotechnology Applied to Reproduction
3. Epidemiology, Diagnosis and Control of Infectious and Parasitic Diseases and their Importance in Public Health



Veterinary Medicine

Participation in CAPES-PrInt



THEME 1

Agriculture and livestock production systems, biodiversity and sustainability

Project 1	Chemometry of essential and toxic metals in cheeses produced in the region of Galicia, Spain - Universidad de Santiago de Compostela, Campus Terra, Lugo, Spain Senior Visiting Professor Abroad (Post doctoral)	September, 2021 to August 2022	Prof. Dr. Pierre Castro Soares Advisor: Dr. Marta Ines Miranda Castañon (USC)
Project 2	Scientific and Academic Cooperation: Federico II University of Naples (Italy) and Postgraduate Program in Veterinary Medicine - PPGMV-UFRPE Missions	2022 (October)	Prof. Dr. André Mariano Partner: Dr. Bianca Gasparini (UniNa)
Project 3	Scientific and Academic Cooperation: CAHFS UC Davis System and PPGMV-UFRPE Missions	2021 to 2022 (January, 2023)	Prof. Dr. Francisco Souza Prof. Dr. Fábio Mendonça (Cancelled) Partner: Dr. Francisco Uzal (UC Davis)



Veterinary Medicine



Actions Developed at the Veterinary Medicine

2022 - 2023

Actions Developed at the Veterinary Medicine in 2021-2022

Senior Visiting Professor Abroad (Post doctoral):

Project (PrInt): "Chemometry of essential and toxic metals in cheeses produced in the region
of

Galicia, Spain"

Period: 09/01/2021 to 08/31/2022

Location: Universidad de Santiago de Compostela, Campus
Terra, Lugo, Spain

Department/Center: Anatomy, Animal Production and
Clinical Sciences



Prof. Dr. Pierre Castro
Soares
UFRPE-PPGMV



Advisor:
Dr. Marta Ines Miranda
Castañon

Actions Developed at the Veterinary Medicine in 2021-2022

Senior Visiting Professor Abroad (Post doctoral):

Project (PrInt): "Chemometry of essential and toxic metals in cheeses produced in the region
of
Galicia, Spain"

Results International cooperation project:

Chemometric analysis of essential and toxic trace metals in bovine raised in the state of Amazonas, Brazil

Published Papers:



Impact factor = 4,93



Article

Concentrations of Essential Trace and Toxic Elements Associated with Production and Manufacturing Processes in Galician Cheese

Emanuel Felipe de Oliveira Filho ^{1,2}, Marta Miranda ^{3,*}, Tania Ferreiro ⁴, Carlos Herrero-Latorre ⁵, Pierre Castro Soares ¹ and Marta López-Alonso ²

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 - ² Department of Animal Pathology, Faculty of Veterinary, University of Santiago de Compostela, Campus Terra, 27002 Lugo, Spain; marta.lopez.alonso@usc.es
 - ³ Department of Anatomy, Animal Production and Clinical Veterinary Sciences, Faculty of Veterinary, University of Santiago de Compostela, Campus Terra, 27002 Lugo, Spain
 - ⁴ Technological Platform: Aula de Productos Lácteos y Tecnologías Alimentarias, University of Santiago de Compostela, Campus Terra, 27002 Lugo, Spain; tania.ferreiro@usc.es
 - ⁵ Research Institute on Chemical and Biological Analysis, Analytical Chemistry, Nutrition and Bromatology Department, Faculty of Sciences, University of Santiago de Compostela, Campus Terra, 27002 Lugo, Spain; carlos.herrero@usc.es
- * Correspondence: marta.miranda@usc.es

Pierre Soares (Brazil); Paulo Azevedo Filho (Brasil); **Marta Castañon** (Espanha); Marta López-Alonso (Espanha); Carlos Herrero-Latorre (Espanha).

Period: 2023/2024



Dr. Pierre Castro
Soares

Actions Developed at the Veterinary Medicine in 2021-2022

Senior Visiting Professor Abroad (Post doctoral):

Project (PrInt): "Chemometry of essential and toxic metals in cheeses produced in the region of Galicia, Spain"

Scientific Meetings and Publications: Results Technical visit: ULisboa

World Buiatrics Congress



CERTIFICATE OF PARTICIPATION

This is to certify that:

Pierre Castro Soares, José Augusto Bastos Afonso, Rodolfo José Cavalcanti Souto, Jobson Filipe de Paula Cajueiro, Carla Lopes de Mendonça, Emanuel Felipe de Oliveira Filho, Nivaldo de Azevedo Costa, Cleyton Charles Dantas Carvalho, Duane H. Keisler

contributed with the Poster titled

Decreased serum leptin in dairy goats affected by pregnancy toxemia

in the 31st WORLD BUIATRICS CONGRESS held in Madrid, Spain, from 4th to 8th September, 2022.

And as evidence thereof, we hereby issue this certificate.



CERTIFICATE OF PARTICIPATION

This is to certify that:

Pierre Castro Soares, Enrico Lippi Ortolani, Marta Lisandra do Rego Leal, Clara Satsuki Mori, Maria Claudia Araripe Sucupira, Alexandre Coutinho Antonelli, Sandra Satilko Kitamura, Marta López-Alonso, Marta Miranda

contributed with the Poster titled

The role of urinary N-acetyl-β-D-glucosaminidase for prediction of renal damage in copper-poisoned sheep

in the 31st WORLD BUIATRICS CONGRESS held in Madrid, Spain, from 4th to 8th September, 2022.

And as evidence thereof, we hereby issue this certificate.



CERTIFICATE OF PARTICIPATION

This is to certify that:

Emanuel Felipe de Oliveira Filho, Pierre Castro Soares, Marta Ines Miranda Castañon, Maria Marta López-Alonso, Guilherme Vieira Marcolino, Carla Lopes de Mendonça, Nivaldo de Azevedo Costa, José Augusto Bastos Afonso

contributed with the Poster titled

Concentration of essential and toxic metals in milk from the state of Pernambuco, Brazil.

in the 31st WORLD BUIATRICS CONGRESS held in Madrid, Spain, from 4th to 8th September, 2022.

And as evidence thereof, we hereby issue this certificate.



Dr. Pierre Castro Soares

Actions Developed at the Veterinary Medicine in 2021-2022

Mission:

Project (PrInt): "Scientific and Academic Cooperation: Federico II University of Naples (Italy) and Postgraduate Program in Veterinary Medicine - PPGMV-UFRPE"



**Prof. Dr. André Mariano
Batista
UFRPE-PPGMV**

Period: October 24 to 31, 2022

Location: Università Degli Studi di Napoli Federico II, Italy



Department of Veterinary Medicine and Animal
Production (DVMAP), Università Degli Studi di
Napoli Federico II, Italy



**Partner:
Prof. Bianca Gasparini
DMV, PhD**

Actions Developed at the Veterinary Medicine in 2021-2022

Mission:

Project (PrInt): "Scientific and Academic Cooperation: Federico II University of Naples (Italy) and Postgraduate Program in Veterinary Medicine - PPGMV-UFRPE"

Results

1) Interest in receiving students from UFRPE for a sandwich doctorate

2) Possibility of sending students to carry out research activities at UFRPE

3) Possibility of a joint mission of professors from Federico II to visiting the experimental stations of UFRPE (2023)

4) International cooperation project - Professors Bianca Gasparrini and Giuseppe Campanile (writing papers as a team)



Visits to the Buffalo Farms. Dr. Sergio Natal (BuBoVet Veterinary Group) and Prof. André Mariano.

Prof. Bianca Gasparrini, Prof. André Mariano and Prof. Giuseppe Campanile



UNIVERSITÀ DEGLI STUDI
DI NAPOLI FEDERICO II

Dr. André M. Batista
UFRPE-PPGMV

Actions Developed at the Veterinary Medicine in 2021-2022

Mission:

Project (PrInt): "Scientific and Academic Cooperation: CAHFS UC Davis System and PPGMV-UFRPE"



Dr. Kevin Woolard



Dr. Anibal Armien



Dr. John Adaska



Dr. Nicolas Streitenberger



Dr. Fábio Mendonça
UFRPE-PPGMV



Dr. Melissa Rioseco



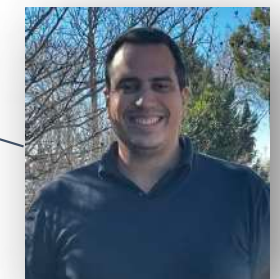
Dr. Francisco Uzal



Dr. Javier Ros



Dr. Eileen Henderson



Dr. Francisco Souza
UFRPE-PPGMV

Actions Developed at the Veterinary Medicine in 2021-2022

Mission:

Project (PrInt): "Scientific and Academic Cooperation: CAHFS UC Davis System and PPGMV-UFRPE"

Period: 2021* (January 13 to 26, 2023)

Location: California Animal Health & Food Safety Laboratory System - UC Davis - Veterinary Medicine, California, USA



Livestock Diagnostic Laboratory

Partners:



Dr. Francisco Uzal

Prof. Dr. Francisco A. L.
Souza



Dr. Javier Ros



Dr. Eileen Henderson

Actions Developed at the Veterinary Medicine in 2021-2022

Mission:

Project (PrInt): "Scientific and Academic Cooperation: CAHFS UC Davis System and PPGMV-UFRPE"

1) Interest in receiving students and professors from UFRPE for a PhD sandwich and Post doctoral

2) Confirmed visit from **Dr. Javier** to the Brazilian Northeast supported by the Brazilian Association of Veterinary Pathology with the possibility of visiting UFRPE

3) Possibility of visiting UFRPE by **Dr. Uzal** as a Foreign Visiting Professor in 2023



Visit to the necropsy room and molecular biology and histopathology laboratories



Prof. Francisco Souza,
Dr. Javier Ros and Dr.
Eileen Handerson –
CAHFS San Bernardino



Dr. Francisco Souza
UFRPE-PPGMV



Veterinary Medicine



*Other internationalization actions developed by the
Veterinary Medicine
2021 - 2022*

Other internationalization actions in 2021-2022

Post doctoral:

Automation e-Synch

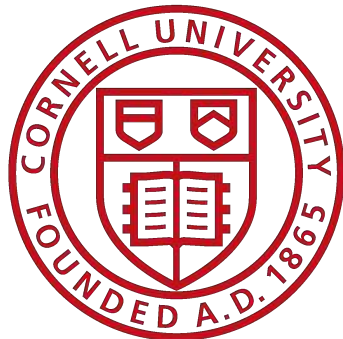
Period: 2021 - own resources

Location: Cornell University, Ithaca, USA

Department/Center: Cornell Dairy Research Center



Prof. Dr. Claudio Coutinho
Bartolomeu
UFRPE-PPGMV



Other internationalization actions in 2021-2022

Post doctoral:

Scholarship on pathogenesis of diseases caused by *Clostridium* spp

Period: 2022-2023

Location: California Animal Health & Food Safety Laboratory System -
UC Davis – Veterinary Medicine, California, USA



Prof. Dr. Fábio Mendonça
UFRPE-PPGMV



Scholarship on pathogenesis of
diseases caused by *Clostridium* spp.



Supervisors:



Dr. Francisco Uzal



Dr. Bruce McLane



Pitt | School of
Medicine

Other internationalization actions in 2021-2022

Post doctoral:

Scholarship on pathogenesis of diseases caused by *Clostridium* spp.

Results

Results
2021



Dr. Fábio Mendonça
UFRPE



Dr. Francisco Uzal
UC Davis



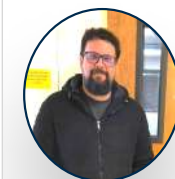
Dr. Javier Asin
UC Davis



Dr. Eileen Henderson
UC Davis



Dr. Mauricio Navarro
UACH



Dr. Fábio Mendonça
UFRPE-PPGMV

Post doctoral:

Scholarship on pathogenesis of diseases caused by *Clostridium* spp.

Results

Results 2022

Pathogenesis of diseases caused by *Clostridium* spp.

Identification of orphan histidine kinases that impact sporulation and enterotoxin production by *Clostridium perfringens* type F strain SM101 in a pathophysiologically relevant *ex-vivo* mouse intestinal contents model

Iman Mehdizadeh Golari¹, Jihong Li¹, Mauricio A. Navarro^{1,2,4}, Fábio S. Mendonça², Francisco A. Uzal² and Bruce A. McClane^{1*}

¹Department of Microbiology and Molecular Genetics, University of Pittsburgh School of Medicine, Pittsburgh, PA USA

²California Animal Health and Food Safety Laboratory System, School of Veterinary Medicine, University of California Davis, San Bernardino, CA, USA

³Current Address: Instituto de Patología Animal, Facultad de Ciencias Veterinarias, Universidad Austral de Chile, Valdivia, Chile

*Corresponding author
Email: bamco@pitt.edu

Short title: Histidine kinases regulating *C. perfringens* sporulation and CPE production

1 Tyzzer disease in 19 preweaned orphaned kittens

2

3 Sai Fingerhood, Fabio S. Mendonça, Francisco A. Uzal, Stanley L. Marks, Karen M.

4 Vernau, Mauricio A. Navarro, Eunju April Choi¹

5

6 Veterinary Medical Teaching Hospital (Fingerhood), California Animal Health and Food Safety

7 Laboratory, San Bernardino Laboratory (Mendonça, Uzal), Departments of Pathology,

8 Microbiology and Immunology (Uzal, Choi), Medicine and Epidemiology (Marks), Surgical and

9 Radiological Sciences (Vernau), School of Veterinary Medicine, University of California–Davis,

0 Davis, CA, USA; Instituto de Patología Animal, Facultad de Ciencias Veterinarias, Universidad

1 Austral de Chile, Valdivia, Chile (Navarro). Current address: Veterinary Pathology Centre,

2 Department of Comparative Biomedical Sciences, School of Veterinary Medicine, Faculty of

3 Health and Medical Sciences, University of Surrey, Guildford, UK (Fingerhood).

4

5 ¹Corresponding author: Eunju April Choi, Department of Pathology, Microbiology and

6 Immunology, School of Veterinary Medicine, University of California–Davis, Davis, CA, USA.

7 eacho@ucdavis.edu

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Other internationalization actions in 2021-2022

Post doctoral:

Scholarship on pathogenesis of diseases caused by *Clostridium* spp.

Results

The role of *Clostridium perfringens* sialidases in the pathogenesis and virulence of human and animal diseases

Fábio S. Mendonça^{1,2}, Mauricio A. Navarro³, Jihong Li⁴, Julian Beingsesser⁵, Bruce A. McClane⁶ and Francisco A. Uzal⁶

¹California Animal Health and Food Safety Laboratory, San Bernardino Branch, School of Veterinary Medicine, University of California Davis, San Bernardino, California, USA

²Instituto de Patología Animal, Facultad de Ciencias Veterinarias, Universidad Austral de Chile, Valdivia, Chile

³Department of Microbiology and Molecular Genetics, University of Pittsburgh, School of Medicine, Pittsburgh, Pennsylvania, USA

⁴Laboratory of Animal Diagnosis, Federal Rural University of Pernambuco, Recife, Pernambuco, Brazil

Abstract

Clostridium perfringens is amongst the most important bacteria causing food poisoning and non-food poisoning enteric disease in humans, necrotizing enteritis, enterotoxemia and traumatic gas gangrene in both humans and livestock. The virulence of *C. perfringens* is largely attributable to this vast array of more than 20 toxins. However, non-toxic factors, such as a wide range of extracellular degradative enzymes like sialidases have been implicated in the pathogenicity of *C. perfringens* toxigenotypes and are under intense investigation. NanJ, NanI, and NanH are the main sialidases produced by the majority *C. perfringens* strains. Recent *in vitro* and *in vivo* studies have been shown these sialidases enhance the toxins binding and cytotoxicity to target tissues, and promote the adherence, growth, colonization and persistence of CP to the host cells. Sialidases are also responsible for enhancing the absorption of toxins leading to increased intestinal damage and lethality during enteritis. This paper comprehensively reviews the current knowledge about the general physiological and pathological pathways of sialic acids and sialidases, and role of NanJ, NanI, and NanH in the pathogenesis of the diseases caused by *C. perfringens* in humans and animals.

Keywords: *Clostridium perfringens*; toxins; virulence; sialidases; sialidase inhibitors; pathogenesis.



Impact factor = 3.3

IN PROGRESS

Agg-like inhibitory peptides can attenuate *C. perfringens* type A gas gangrene and type C necrotizing enteritis in animal experimental models

Fábio S. Mendonça,¹ Mauricio A. Navarro,² Jihong Li,³ Julian Beingsesser,⁴ Bruce A. McClane,⁵ Francisco A. Uzal⁶

¹California Animal Health and Food Safety Laboratory System, School of Veterinary Medicine, University of California, Davis, San Bernardino, CA

²Instituto de Patología Animal, Facultad de Ciencias Veterinarias, Universidad Austral de Chile, Chile

³Department of Microbiology and Molecular Genetics, University of Pittsburgh School of Medicine, Pittsburgh, PA

⁴Corresponding author:

Francisco A. Uzal

California Animal Health and Food Safety Laboratory System, San Bernardino Branch

University of California, Davis, 105 West Central Avenue

San Bernardino, CA 92408

Phone: 909-383-4287

Email: fsuzal@ucdavis.edu

Running title: Agg-like inhibitory peptides can attenuate gas gangrene and necrotizing enteritis caused by *C. perfringens*

IN PROGRESS



Impact factor = 4.1



Dr. Fábio Mendonça
UFRPE-PPGMV

Other internationalization actions in 2021-2022

Post doctoral:

Scholarship on pathogenesis of diseases caused by *Clostridium* spp.

Results

Scientific Meetings and Publications:



2022 Meeting
American Association of Veterinary Laboratory
Diagnostics



2022 Meeting
The Anaerobe Society of the
Americas



Dr. Fábio Mendonça
UFRPE-PPGMV

Other internationalization actions in 2021-2022

Participation in conferences :

11th International Conference on Equine Exercise Physiology, Uppsala, Sweden 2022



Prof. Dr. Hélio C. Manso
Filho



Period: 2022

Location: 11th International Conference on Equine Exercise Physiology – 2022, Sweden.

Oral presentations:

1) *Impact of furosemide and exercise on the cytokine response in Standardbreds (UFRPE, Rutgers, U. Delawere, U. Kentucky)*

2) *Glucose and lactate in equine faecal liquor are altered after exercise independent of furosemide (UFRPE, Rutgers, U. Delawere)*

Other internationalization actions in 2021-2022

Participation in conferences :

11th International Conference on Equine Exercise Physiology, Uppsala, Sweden 2022

Abstract:

- **Is a 6-week training protocol effective in preparing Lusitano horses in early athletic life?** C. Coelho, A. Silva, A. Santos, C. Vintém, C. Santos, J. Simões, J. Fonseca, J. Prazeres, V. Souza, A. Gola and **H. Manso Filho**
- **Which spend more energy in the practice of Vaquejada: pull horses or helper horses?** C. Coelho, T. Sodr , L. Sousa, R. Siqueira and H. Manso Filho
- **Equine muscle activity with induced stride alterations**
E.M. Rankins, **H.C. Manso Filho**, T. Yigit, K. Malinowski and K.H. McKeever
- **Equine muscle activity with induced stride alterations**
E.M. Rankins, **H.C. Manso Filho**, T. Yigit, K. Malinowski¹ and K.H. McKeever




Result of Print 2019 (Rutgers University): Published papers

Received: 20 December 2021 | Revised: 15 February 2022 | Accepted: 17 February 2022
DOI: 10.14814/phyz.15220

ORIGINAL ARTICLE

Muscular tension as an indicator of acute stress in horses

Ellen M. Rankins¹ | Helio C. Manso Filho² | Karyn Malinowski¹ | Kenneth H. McKeever¹ 

¹Equine Science Center, Department of Animal Science, Rutgers The State University of New Jersey, New Brunswick, New Jersey, USA
²Departamento de Zootecnia, Universidade Federal Rural de Pernambuco (UFRPE), Recife-PE, Brasil

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Kenneth H. McKeever, Equine Science Center, Department of Animal Science, Bartlett Hall, Rm 003, Rutgers University, 84 Lipman Drive, New Brunswick, NJ 08901, USA.
Email: mckeever@sebs.rutgers.edu

Funding information
This study was supported by funding from the Rutgers Equine Science Center. HCMF received a scholarship from the CAPES / PRINT / UFRPE program.

Abstract
Horses' muscular tension during acute stress remains unexplored. Our aim was to assess muscular, behavioral, cortisol, and hematocrit responses to social isolation (ISO), novel object exposure (NOV), and sham clipping (CLIP). Altered stress responses were expected. Eight mature Standardbred horses (four mares and four geldings) were exposed to acute stressors and a control period (CON) in a balanced, replicated 4x4 Latin Square experimental design with 3 min treatment periods and 10 min washout periods. Surface electromyography collected from the *masseter*, *brachiocephalus*, *cervical trapezius*, and *longissimus dorsi* was processed to derive average rectified value (ARV) and median frequency (MF) during the initial, middle, and final 30 s of treatments. ARV and MF data were log transformed then analyzed using a mixed model, repeated measures ANOVA along with plasma cortisol and hematocrit. Behavior data were analyzed using a negative binomial distribution mixed model ANOVA. CLIP resulted in greater ($p < 0.05$) log ARV in the *masseter* (1.5 + 1.5%, mean + SD) and *brachiocephalus* (2.2 + 2.0%) than CON (-1.2 + 1.4%, 0.1 + 1.5%). ISO resulted in greater ($p < 0.05$) log ARV in the *masseter* (0.2 + 1.3%) and *cervical trapezius* (0.6 + 1.3%) than CON (-1.2 + 1.4%, -1.0 + 1.7%). ISO increased ($p < 0.05$) the total number of stress-related behaviors and hematocrit. No changes in cortisol were observed. We suggest that muscular tension can be used as an indicator of acute stress in horses. Incorporating muscle activity into an array of measurements may provide a more nuanced understanding of stress responses.

KEYWORDS
acute stress, behavior, equine, surface EMG

1 | INTRODUCTION

All species experience stress – a disruption in the body's homeostasis provoked by mental, emotional, or physical strain resulting in physiological and behavioral responses to the stimuli. We often think of stress as something needing to be eliminated or minimized. In reality, stress can be positive, eustress, or negative, distress. Distress, stress that is damaging or unpleasant, is often what people think of when the word stress is used.

1.1 Introduction

Inflammatory airway disease (IAD) is a widespread condition in horses resulting in impaired gas exchange and interference with optimal performance. This respiratory condition can affect as many as 80% of all 2-year-old racehorses, 14% of racing horses of all age groups (Wood *et al.*, 2005), and is the second most common cause of lost training days in racehorses (Wilsner *et al.*, 2006). Stabled racehorses are also subjected to high concentrations of fine particulate matter that can reach the lower airways, contributing to the incidence of IAD (Millerick-May *et al.*, 2011).

Clenbuterol (Figure 1) is an FDA approved oral β_2 agonist (Ventipulmin[®]) used for the management of IAD and airway obstruction in horses (Couetil *et al.*, 2016). Clenbuterol is unusual in that its phenolic chlorines increase the oral bioavailability and slows its metabolism as compared to other β_2 -adrenoceptor agonist medications. These

FI: 2,47

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<https://doi.org/10.14814/phyz.15220>

wileyonlinelibrary.com/journal/phyz2 | 1 of 14

Comparative Exercise Physiology, 2021, 17 (4): 343-350


Wageningen Academic Publishers

Clenbuterol plasma concentrations after therapeutic administration in fit Standardbred horses: threshold recommendations

K.H. McKeever¹, H.C. Manso Filho², E.M. Rankins³, C.S. Duchamp⁴, Y. Salah⁵, C.K. Fenger⁶, W.C. Duer⁷, K. Malinowski¹ and G.A. Maylin⁸

¹Equine Science Center, Department of Animal Science, Rutgers – The State University of New Jersey, 84 Lipman Drive, New Brunswick, NJ 08901, USA; ²Federal Rural University of Pernambuco, Rua Dom Manuel de Medeiros, 52171-900 Recife, PE, Brazil; ³Equine Integrated Medicine, PLLC, 4004 Ironworks Rd., Georgetown, KY 40324, USA; ⁴Duer Forensic Toxicology LLC, 1621 Gulf Blvd #102, Clearwater, FL 33767-2928, USA; ⁵New York Drug Testing and Research Program, Morrisville State College, 777 Warren Rd, Ithaca, NY 14853, USA; ⁶mckeever@sebs.rutgers.edu

Received: 8 September 2020 / Accepted: 29 September 2020
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OPEN ACCESS  RESEARCH ARTICLE

Abstract

Clenbuterol, (*R,S*)-1-(4-amino-3,5-dichlorophenyl)-2-(*tert*-butylamino)ethan-1-ol, as Ventipulmin is an FDA approved β_2 agonist medication for the management of airway obstruction in horses. Administration above the FDA approved doses for clenbuterol produces repartitioning effects, which have led to restrictions on its use in human athletics and Quarter Horse and Thoroughbred racing. Clenbuterol, however has long been used therapeutically at FDA approved doses in Harness racing. The goal of this study was to identify a withdrawal time guideline for its use at FDA approved dose levels in Harness racing, where horses may start at seven-day intervals. Eight healthy, moderately fit Standardbred horses (4 mares, 4 geldings, weight 491±40 kg, age 13±2 years) were administered 0.8 µg/kg of clenbuterol as Ventipulmin syrup twice daily (BID) for three days. Blood samples were collected prior to dosing and at 1, 24, 48 and 96 h post administration. Clenbuterol was quantified in all samples using the New York Drug Testing and Research Laboratory ISO-17025 Racing and Medication Testing Consortium (RMTC) accredited quantitative procedure. The lower limit of quantitation of the method was 1.0 pg/ml, and three data points at 96 h post administration were censored. One horse developed diarrhoea and data from this horse was excluded from the overall analysis. Plasma regulatory thresholds were calculated using the 95/95 tolerance method and Gauss Camp Meidell at $P=0.05$ and $P=0.001$. Horses were also evaluated for effects of clenbuterol on body composition using body mass and ultrasound measurements of rump fat thickness. There were no effects ($P>0.05$) of clenbuterol on any of the measures including fat mass and fat free mass and thus no repartitioning effect was observed. The pharmacokinetic data and the 96 h data set support the therapeutic use of clenbuterol in Harness horses at the FDA approved 0.8 µg/kg BID dose for three days and suggest a 41 pg/ml regulatory threshold for a 96 h withdrawal time with a $P=0.001$ probability of randomly exceeding this regulatory threshold.

Keywords: horse, clenbuterol, racing, regulatory thresholds, Standardbred

FI: 0,74

1. Introduction

Inflammatory airway disease (IAD) is a widespread condition in horses resulting in impaired gas exchange and interference with optimal performance. This respiratory condition can affect as many as 80% of all 2-year-old racehorses, 14% of racing horses of all age groups (Wood *et al.*, 2005), and is the second most common cause of lost training days in racehorses (Wilsner *et al.*, 2006). Stabled racehorses are also subjected to high concentrations of fine particulate matter that can reach the lower airways, contributing to the incidence of IAD (Millerick-May *et al.*, 2011).

Clenbuterol (Figure 1) is an FDA approved oral β_2 agonist (Ventipulmin[®]) used for the management of IAD and airway obstruction in horses (Couetil *et al.*, 2016). Clenbuterol is unusual in that its phenolic chlorines increase the oral bioavailability and slows its metabolism as compared to other β_2 -adrenoceptor agonist medications. These

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Other internationalization actions in 2021-2022

Result of International Cooperation (Lusofona University): Published papers




Article

How Much Energy Vaquejada Horses Spend in a Field Simulation Test?



Clarisse S. Coelho^{1,2}, Tiziane D. R. P. Sodré², Lara N. Sousa², Renata F. Siqueira³, Helio C. Manso Filho⁴, Francisca Aragonsa² and Francisco Fazio^{5,6} 

Abstract: Vaquejada is an important Brazilian equine discipline characterized by high-intensity and short-duration exercise that should influence the energetic cost for athletic horses. The aim of this study was to analyze this effect by a vaquejada simulation test (VST), in order to evaluate energy expenditure (EE), transport cost (COT) and metabolic energy requirement (Pmet) in horses. Eight Quarter Horses were evaluated in a VST composed of three races (30–150 m each) with a 5-min interval between them. All horses used an integrated heart rate (HR) and GPS monitoring system (V80, Polar Electro, Lake Success, NY, USA) to calculate the energetic index (EE, COT and Pmet). Furthermore, blood samples were collected for lactate analysis at rest, immediately after the first, second and third race and after 30 min of recovery. The results highlight that pull horses (PH) had higher EE and COT, while helper horses (HH) had higher Pmet. Although practicing the same sport, PH and HH must be considered different athletes by veterinarians, owners and all practitioners of this specific sport.

Abstract: Vaquejada é uma alta-intensidade e curta duração exercício em que os cavalos auxiliares (HA) são responsáveis por fazer o boi correr em uma linha enquanto os cavalos puxadores (CP) trabalham para puxar o boi dentro de 100 m de rinha. O propósito deste estudo foi quantificar e comparar os gastos energéticos (EE), custos de transporte (COT) e requisitos energéticos metabólicos (Pmet) de cavalos usados em Vaquejada. Foram avaliados oito cavalos Quarter Horse, em pares aleatoriamente formados, em uma simulação de teste de vaquejada (VST), que consistiu de três corridas em uma pista de 30 a 150 m, com um intervalo de 5 minutos entre elas. Todos os cavalos usaram um sistema integrado de frequência cardíaca (FC) e GPS para monitorar o sistema (V80, Polar Electro) para calcular o índice energético (EE, COT e Pmet). Além disso, amostras de sangue foram coletadas para lactato no repouso, imediatamente após a primeira, segunda e terceira corrida e após 30 minutos de recuperação. Os dados obtidos foram submetidos a testes ANOVA e Tukey (p < 0,05). Em VST, os CP apresentaram maior EE e maior HR em repouso, enquanto os HA apresentaram maior EE e HR durante a corrida. Portanto, considerando o mesmo esporte, os CP e os HA devem ser considerados atletas diferentes, e estes devem ser considerados para serem submetidos a programas físicos e nutricionais apropriados, que visam melhorar o desempenho e garantir o bem-estar.


Keywords: energy expenditure; equine; equestrian performance; field tests

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Article



Effects of the Ingestion of Ripe Mangoes on the Squamous Gastric Region in the Horse

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Abstract: Esosions and gastric ulcers may be present in horses at any age and under different conditions of rearing and handling. In tropical regions, horses can feed on fruits rich in soluble carbohydrates, such as mangoes, but little is known about how these foods interact with their digestive systems. To test the hypothesis that the ingestion of ripe mangoes with pectin could cause disturbances in the digestive processes of horses, an experiment was performed to monitor animals that had free access to ripe mangoes in their pasture areas. Horses (purebred Arabians, n = 5, >40 kg, ~13 years) were evaluated by video gastroscopy and blood analysis. A controlled postprandial glucose curve for mango intake was also performed. Gastroscopies were performed at intervals of 15 days, starting in December, just before the beginning of the harvest, until the beginning of February, and days after the end of the harvest. Blood collection was performed on the same day between November and February for blood analysis. The results were submitted to ANOVA and Tukey's test, with a significance level of p < 0.05. Gastroscopies indicated that four out of five horses had erosions and ulcers in the squamous region between 15 and 30 days after the start of the season. Biochemical tests indicated a reduction in plasma proteins during the harvest period, and the postprandial glucose curve showed concentrations above 200 mg/dL between 30 and 180 min after ingestion of 5.37 kg mangoes. The animals were not treated and recovered after 15 days of harvest and without rope mangers on the ground. It is concluded that the indiscriminate ingestion of mangoes favors the appearance of lesions in the gastric squamous region, to varying degrees, and that animals recover naturally after an average of 15 days from the end of the season when the animals return to their regular feeding with hay and grass pasture.


Keywords: equine; gastric ulcers; soluble carbohydrates; tropical nutrition

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Article

Training Effects on the Stress Predictors for Young Lusitano Horses Used in Dressage

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Abstract: Dressage is an Olympic equestrian discipline that requires specific characteristics such as agility and obedience skills and a precise interaction between the horse and the rider. The comprehension of such a level of effort and planning a specific training protocol are important and tracking the exercise-related stress responses of the horses represents a way to monitor sports training and the wellbeing of athletic animals. The purpose of this study was to investigate stress responses during a 6-week training protocol in young Lusitano dressage horses. Nine 4-year-old horses were evaluated before and after six weeks of a training protocol which included 40–80 min of individually intensity-adjusted preparatory exercises for dressage, six times per week. For both moments, the horses were examined before and immediately after the dressage simulation test, and at 30 and 240 min during the recovery period. The evaluated stresses included heart rate (HR), heart rate variability (HRV), cortisol, total white blood cell count (WBC), and neutrophil and lymphocyte counts. After training, there were significant reductions in cortisol, HR, total WBC, neutrophils and lymphocytes, and an increase in the HRV parameters related to a cardiac vagal modulation. In conclusion, the chosen training protocol led to better fitness. Such data can be used to evaluate performance, but also to predict the welfare of athletic horses.

Abstract: O propósito deste estudo foi investigar respostas de stress durante um protocolo de treino de 6 semanas em cavalos Lusitano jovens usados em dressagem. Os hipoteses são que o protocolo proposto de treino levaria a melhor forma física e garantiria o bem-estar dos animais ao reduzir os preditores de stress. Nove cavalos de 4 anos foram avaliados antes (M1) e seis semanas depois (M2) de um protocolo de treino. O treino foi realizado seis vezes por semana e incluiu sessões de 40–80 minutos de exercícios preparatórios ajustados individualmente para o dressagem. Para ambos os momentos, os cavalos foram examinados antes (T0) e imediatamente após o teste de simulação de dressagem (T1) e em 30 (T2) e 240 (T3) minutos durante o período de recuperação. Os stressores avaliados incluíam frequência cardíaca (FC), variabilidade da frequência cardíaca (VFC), cortisol, contagem total de leucócitos (TLC) e contagens de neutrófilos e linfócitos. Após o treino, houve reduções significativas em cortisol, FC, TLC total, WBC total e neutrófilos e linfócitos. Houve um aumento nos parâmetros de HRV relacionados a modulação vagal cardíaca. Em conclusão, o protocolo de treino escolhido levou a uma melhor forma física dos cavalos. Esses dados podem ser usados para avaliar o desempenho, mas também para prever o bem-estar dos animais atléticos.

Animals 2022, 11, 3426. <https://doi.org/10.3390/ani11233426> <https://www.mdpi.com/journal/animals>

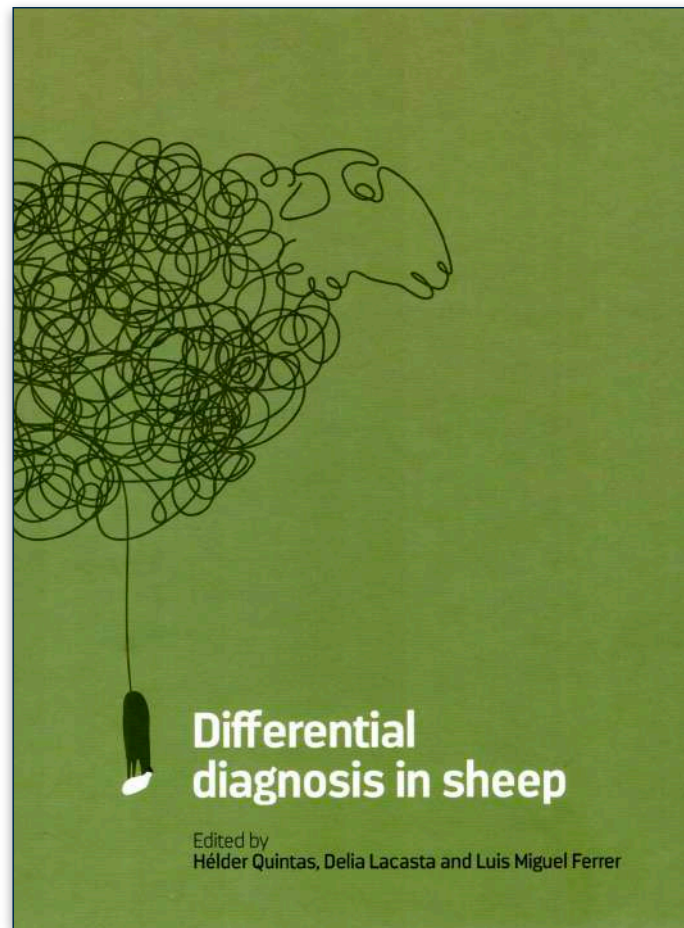

Other internationalization actions in 2021-2022

Book chapter:

Book: Differential diagnosis in sheep – Chapter: Abdominal pain



Prof. Dr. Huber Rizzo
UFRPE-PPGMV

Chapter 7: Abdominal pain

Maria Claudia Araripe Sucupira, University of Sao Paulo (Brazil), PhD.
Huber Rizzo, Rural Federal University of Pernambuco (Brazil), PhD.
Stefano Carlo Phillippo Hagen, University of Sao Paulo (Brazil), PhD.
Enrico Lippi Ortolani, University of Sao Paulo (Brazil), PhD.

Abdominal pain in sheep is a consequence of fermentative, obstructive and/or infectious disorders in the digestive, reproductive and/or urinary systems.

The main causes of abdominal pain are abdominal distension, which may be due to pregnancy, abnormal accumulations of food, gas or fluid in the abdominal cavity or herniation of the abdominal wall; enterotoxaemia; diarrhoea or urinary tract obstruction (figure 7.1).

For the diagnosis of abdominal pain and its origin, in addition to the history, clinical examination provides much information. Upon inspection of the abdominal contours from the posterior view, some alterations may be suspected (figure 7.2).

Abdominal pain related to digestive disorders

Bloat

Abdominal distension due to rumenoreticulum overdistention (bloat) is a painful process, and in severe cases sheep may collapse and die. Bloat or ruminal tympany can be primary, called frothy bloat, or secondary. The primary causes are diet-related, usually sheep grazing on lush pastures, especially young legume-dominant pastures, as alfalfa and clovers. Any eructation impairment, owing to oesophageal stenosis, physical obstruction, outside compression (e.g. lymphadenopathy) or disease (e.g. tetanus) leads to gas accumulation and secondary or free-gas bloat.

Diagnosis

History and clinical examination. Most obstructive causes can be detected when passing a stomach tube. Instead, in frothy bloat, rumen gas can't be released.

Abomasal impaction

This condition occasionally occurs in sheep with a high mortality rate. It happens when there is an obstruction in the passage of fluid and ingesta from the abomasum to the posterior segments of the digestive tract. Poor quality food, sand, gravel, foreign bodies, or neurological dysfunction may be the reasons. The abomasal emptying defect (AED), which leads to distention and impaction of the abomasum, is more frequent in Suffolk sheep, although Hampshire, Dorset, and Texel breed can also be affected.

Diagnosis

Elevated rumen chloride levels in the rumen fluid due to abomasal reflux (>15 mEq/l). Ultrasound examination shows abomasal distension and reduced or atypical motility. On radiography, excessive sand or gravel in the digestive tract can be found.

Participation in conferences :

10th International Sheep Veterinary Congress, Sevilla, 2023

Abstract:

- **Occurrence of Chlamydia abortus in goats and sheep** Lucas Alencar Fernandes Beserra; Gisela Gregoria Choque; Jeferson Carvalho da Silva; Marcia Mayumi Fusuma²; Liria Hiromi Okuda; Marian Ramo Gil; **Huber Rizzo**; Lilian Gregory
- **Study of occurrence Q fever in small ruminants with reproductive problems** - Gisela Gregoria Choque; Lucas Alencar Fernandes Beserra; Jeferson Carvalho Da Silva; Marcia Mayumi Fusuma; Liria Hiromi Okuda; Marian Ramo Gil; **Huber Rizzo**; Lilian Gregory
- **Occurrence of Toxoplasmosis in goats and sheep** - Lucas Alencar Fernandes Beserra¹; Gisela Gregoria Choque; Jeferson Carvalho da Silva; Marcia Mayumi Fusuma; Liria Hiromi Okuda; Marian Ramo Gil; **Huber Rizzo**; Lilian Gregory
- **Occurrence and risk factors associated with small ruminant lentivirus infection in goat and sheep herds** - Jeferson da Silva Carvalho, Lilian Gregory, **Huber Rizzo**



Foreign students:

Exclusive Master Science and PhD vacancies for foreign students
in PPGMV Public Notices

Masters and PhD students:



Usman Usman - Nigeria
Completed PhD



Soke Cedril - Benin
Master Science in
progress



Silvio Castillo -
Nicaragua
PhD in progress



Barbara Navarro -
México
Master Science in
progress

Project approved by CAPES-PRINT/UFRPE* – 2023

THEME 1

Agriculture and livestock production systems, biodiversity and sustainability

Project 1

"New technologies in dairy and beef cow reproduction" and "Farming 4.0: The role of automation in the dairy industry"



Status
Approved
Apr 2023

Dr. Ronaldo Cerri, DMV, MSc,
PhD

Broadening and consolidation of international partnerships

Foreign Visiting Professor

- Give a class: 1) New technologies in dairy and beef cow reproduction and 2) Farming 4.0: The role of automation in the dairy industry
- Discuss projects to be jointly developed between University British Columbia and the Federal Rural University of Pernambuco

THEME 1

Agriculture and livestock production systems, biodiversity and sustainability

Project 2

"Diagnosis of wildlife diseases"



Status
Approved
Jul 2023

Dr. Anibal Armien
DMV, MSC, PhD, DACVP

Broadening and consolidation of international partnerships

Foreign Visiting Professor

- Applying the methodology of the American College of Veterinary Pathologists to train students of Veterinary Medicine in diagnosis of diseases of wildlife;
- Train Master, PhD and undergraduate DVM students in diseases of wildlife
- Train residents enrolled in the Veterinary Sciences programs in diseases of wildlife
- Train Veterinary Medicine lecturers and professors in diseases of wildlife.

Project approved by CAPES-PRINT/UFRPE* – 2023

THEME 1

Agriculture and livestock production systems, biodiversity and sustainability

Project 3

“Training in diagnosis of
diseases of ruminants and
horses”



Status
In progress
Nov 2023

Dr. Francisco A Uzal
DMV, MSC, PhD, DACVP
(Approved in 2021, but canceled
due to the pandemic)

Broadening and consolidation of international partnerships

Foreign Visiting Professor

- Applying the methodology of the American College of Veterinary Pathologists to train students of Veterinary Medicine in diagnosis of diseases of ruminants and horses;
- Train 50 Master and PhD DVM students in diseases of ruminants and horses.
- Train 10 residents enrolled in the Veterinary Sciences programs in diseases of ruminants and horses;
- Train Veterinary Medicine lecturers and professors in diseases of ruminants and horses.





Products of science and technology

*as a result of International cooperation
established in the 2022*

Products:

Papers:

12 international papers in high impact journals

Guidelines and defenses:

1 Book chapter

Scientific conferences, workshops and congresses:

Participation in international conferences: 4

11 published abstract



Annual Action Plan 2023-2024



1. Send Dr. Francisco Souza to UC Davis (***PDJ – Post doctoral***)
2. Send Silvio Castillo to UC Davis (***PDSE - PhD Sandwich***)
3. Send Dr. Fábio Mendonça to Purdue University/Veterinary College (***Mission***)
4. Bring Dr. Aline Hoffmann - College of Veterinary Medicine/University of Florida (***PVE - Foreign Visiting Professor Scholarships***)
5. To stimulate students and the staff to make partnerships
6. Improve existing partnerships



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Thanks!!!
Obrigado