UNIVERSIDADE FEDERAL RURAL DE PERNAMBUCO

Federal Rural University of Pernambuco

Veterinary Medicine

CAPES/PrInt – UFRPE

Strategic planning and actions 2021-2022

UNIVERSIDADE FEDERAL RURAL DE PERNAMBUCO

PPGMV
PROGRAMA DE PÓS-GRADUAÇÃO EM MEDICINA VETERINÁRIA
UFRPE

Veterinary Medicine (since 1978)

Level 5 - CAPES
Faculty: 20
MD students: 35
PhD students: 65
Coordinator: Prof. Joaquim Evêncio Neto
Website: www.pgvet.ufrpe.br
E-mails: coordenacao.pgv@ufrpe.br

- Research Areas:

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

UNIVERSIDADE FEDERAL RURAL DE PERNAMBUCO

Veterinary Medicine

PPGMV
PROGRAMA DE PÓS-GRADUAÇÃO EM MEDICINA VETERINÁRIA
UFRPE

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 Gasparrini (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)

UNIVERSIDADE FEDERAL RURAL DE PERNAMBUCO

Veterinary Medicine

PPGMV
PROGRAMA DE PÓS-GRADUAÇÃO EM MEDICINA VETERINÁRIA
UFRPE

Actions Developed at the Veterinary Medicine

2022 - 2023

Actions Developed at the Veterinary Medicine in 2021-2022

UNIVERSIDADE FEDERAL RURAL DE PERNAMBUCO

PPGMV PROGRAMA DE PÓS-GRADUAÇÃO EM MEDICINA VETERINÁRIA UFRPE

Senior Visiting Professor Abroad (Post doctoral):

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

Prof. Dr. Pierre Castro Soares
UFRPE-PPGMV

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

USC UNIVERSIDADE DE SANTIAGO DE COMPOSTELA

Advisor:
Dr. Marta Ines Miranda Castañon

Actions Developed at the Veterinary Medicine in 2021-2022

UNIVERSIDADE FEDERAL RURAL DE PERNAMBUCO

PPGMV PROGRAMA DE PÓS-GRADUAÇÃO EM MEDICINA VETERINÁRIA UFRPE

Senior Visiting Professor Abroad (Post doctoral):

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

Results

Published Papers:

molecules — Impact factor = 4,93 — MDPI

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]

1 Department of Veterinary Medicine/UFRPE, Rua Dom Manoel de Medeiros, Dois Irmãos, Recife 52171-900, Brazil; felipe130188@gmail.com (E.F.d.O.F.); pcastro.pe@gmail.com (P.C.S.)
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

International cooperation project:

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

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

Period: 2023/2024

USC UNIVERSIDADE DE SANTIAGO DE COMPOSTELA

Dr. Pierre Castro Soares

Actions Developed at the Veterinary Medicine in 2021-2022

UNIVERSIDADE FEDERAL RURAL DE PERNAMBUCO

PPGMV PROGRAMA DE PÓS-GRADUAÇÃO EM MEDICINA VETERINÁRIA UFRPE

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 certifi

LISBOA UNIVERSIDADE DE LISBOA

FACULDADE DE MEDICINA VETERINÁRIA

Dr. Ru… anquinho …

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 Satiko 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.

USC UNIVERSIDADE DE SANTIAGO DE COMPOSTELA

Dr. Pierre Castro Soares

Actions Developed at the Veterinary Medicine in 2021-2022

UNIVERSIDADE FEDERAL RURAL DE PERNAMBUCO

PPGMV PROGRAMA DE PÓS-GRADUAÇÃO EM MEDICINA VETERINÁRIA UFRPE

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

UNIVERSITÀ DEGLI STUDI DI NAPOLI FEDERICO II

Dipartimento Medicina Veterinaria Produzioni Animali

Partner:
Prof. Bianca Gasparini
DMV, PhD

Actions Developed at the Veterinary Medicine in 2021-2022

UNIVERSIDADE FEDERAL RURAL DE PERNAMBUCO

PPGMV PROGRAMA DE PÓS-GRADUAÇÃO EM MEDICINA VETERINÁRIA UFRPE

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

UNIVERSIDADE FEDERAL RURAL DE PERNAMBUCO

PPGMV PROGRAMA DE PÓS-GRADUAÇÃO EM MEDICINA VETERINÁRIA UFRPE

Mission:

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

Dr. Kevin Woolard

Dr. Anibal Armien

UCDAVIS VETERINARY MEDICINE
California Animal Health & Food Safety Laboratory System

Dr. John Adaska

Dr. Nicolas Streitenberger

Dr. Melissa Rioseco

Dr. Francisco Uzal

Dr. Fábio Mendonça
UFRPE-PPGMV

Dr. Javier Ros

Dr. Eileen Henderson

Dr. Francisco Souza
UFRPE-PPGMV

Actions Developed at the Veterinary Medicine in 2021-2022

UNIVERSIDADE FEDERAL RURAL DE PERNAMBUCO

PPGMV PROGRAMA DE PÓS-GRADUAÇÃO EM MEDICINA VETERINÁRIA UFRPE

Mission:

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

Prof. Dr. Francisco A. L. Souza
UFRPE- PPGMV

UCDAVIS VETERINARY MEDICINE
California Animal Health & Food Safety Laboratory System

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

Dr. Javier Ros

Dr. Eileen Henderson

Actions Developed at the Veterinary Medicine in 2021-2022

UNIVERSIDADE FEDERAL RURAL DE PERNAMBUCO

PPGMV PROGRAMA DE PÓS-GRADUAÇÃO EM MEDICINA VETERINÁRIA UFRPE

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

UNIVERSIDADE FEDERAL RURAL DE PERNAMBUCO

Veterinary Medicine

PPGMV
PROGRAMA DE PÓS-GRADUAÇÃO EM MEDICINA VETERINÁRIA
UFRPE

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

UNIVERSIDADE FEDERAL RURAL DE PERNAMBUCO

PPGMV PROGRAMA DE PÓS-GRADUAÇÃO EM MEDICINA VETERINÁRIA UFRPE

Post doctoral:

Scholarship on pathogenesis of diseases caused by Clostridium spp

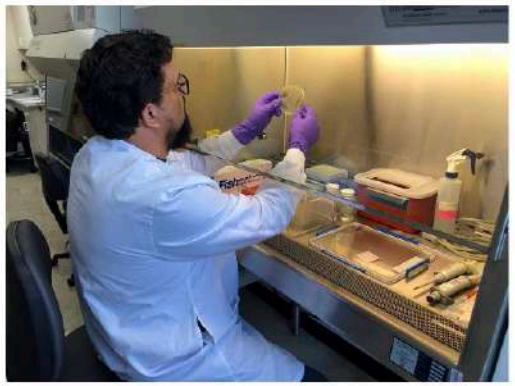
Prof. Dr. Fábio Mendonça
UFRPE-PPGMV

Period: 2022-2023

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

NIH National Institute of Allergy and Infectious Diseases

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



Supervisors:

Dr. Francisco Uzal

UCDAVIS VETERINARY MEDICINE

Dr. Bruce McClane

Pitt School of Medicine

UCDAVIS VETERINARY MEDICINE
California Animal Health & Food Safety Laboratory System

Other internationalization actions in 2021-2022

Post doctoral:

Scholarship on pathogenesis of diseases caused by Clostridium spp.

Results

Results 2021

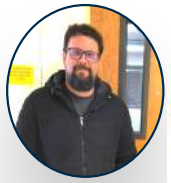

Dr. Fábio Mendonça
UFRPE


Dr. Francisco Uzal
UC Davis


Dr. Javier Asin
UC Davis


Dr. Eileen Henderson
UC Davis


Dr. Mauricio Navarro
UACh



Dr. Fábio Mendonça
UFRPE-PPGMV

Other internationalization actions in 2021-2022

UNIVERSIDADE FEDERAL RURAL DE PERNAMBUCO

PPGMV PROGRAMA DE PÓS-GRADUAÇÃO EM MEDICINA VETERINÁRIA UFRPE

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 Gohari[1], Jihong Li[1], Mauricio A. Navarro[2,3¤], Fábio S. Mendonça[2], Francisco A. Uzal[2] and Bruce A. McClane[1*]

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

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

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

*Corresponding author
Email: bamcc@pitt.edu

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

ACCEPTED

PLOS PATHOGENS

Impact factor = 7.01

1 **Tyzzer disease in 19 preweaned orphaned kittens**

2

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

4 **Vernau, Mauricio A. Navarro, Eunju April Choi[1]**

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

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

7 eachoi@ucdavis.edu

18

19 JOURNAL OF VETERINARY DIAGNOSTIC INVESTIGATION

ACCEPTED

1.135 Impact Factor

Journal Indexing & Metrics »

CALIFORNIA ANIMAL HEALTH & FOOD SAFETY LABORATORY SYSTEM · U C DAVIS

Dr. Fábio Mendonça
UFRPE-PPGMV

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[a,d], Mauricio A. Navarro[b], Jihong Li[c], Juliann Beingesser[a], Bruce A. McClane[c] and Francisco A. Uzal[a]

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

[b]Instituto de Patologia Animal, Facultad de Ciencias Veterinarias, Universidad Austral de Chile, Valdivia, Chile

[c]Department of Microbiology and Molecular Genetics, University of Pittsburgh, School of Medicine, Pittsburgh, Pennsylvania, USA

[d]Laboratory 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 armory of more the 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* toxinotypes 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.

IN PROGRESS

Impact factor = 3.3

Agr-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] Juliann Beingesser,[1] Bruce A. McClane,[3] Francisco A. Uzal[1]*

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

[2]Instituto de Patologia Animal, Facultad de Ciencias Veterinarias, Universidad Austral de Chile, Chile

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

***Corresponding 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: fauzal@ucdavis.edu

IN PROGRESS

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

mSphere™
RAPID OPEN ACCESS COMMUNICATION ACROSS THE MICROBIAL SCIENCES

Impact factor = 4.1

Dr. Fábio Mendonça
UFRPE-PPGMV

Other internationalization actions in 2021-2022

UNIVERSIDADE FEDERAL RURAL DE PERNAMBUCO

PPGMV PROGRAMA DE PÓS-GRADUAÇÃO EM MEDICINA VETERINÁRIA UFRPE

Post doctoral:

Scholarship on pathogenesis of diseases caused by Clostridium spp.

Results

Scientific Meetings and Publications:

2022 Meeting
American Association of Veterinary Laboratory Diagnosticians

2022 Meeting
The Anaerobe Society of the Americas

Dr. Fábio Mendonça
UFRPE-PPGMV

Other internationalization actions in 2021-2022

UNIVERSIDADE FEDERAL RURAL DE PERNAMBUCO

PPGMV PROGRAMA DE PÓS-GRADUAÇÃO EM MEDICINA VETERINÁRIA UFRPE

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 independente of furosemide*** *(UFRPE, Rutgers, U. Delawere)*

Other internationalization actions in 2021-2022

UNIVERSIDADE FEDERAL RURAL DE PERNAMBUCO

PPGMV PROGRAMA DE PÓS-GRADUAÇÃO EM MEDICINA VETERINÁRIA UFRPE

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. Sodré, 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

Dr. Hélio Manso Filho
UFRPE-PPGMV

Other internationalization actions in 2021-2022

UNIVERSIDADE FEDERAL RURAL DE PERNAMBUCO

PPGMV PROGRAMA DE PÓS-GRADUAÇÃO EM MEDICINA VETERINÁRIA UFRPE

Result of Print 2019 (Rutgers University):

Published papers

Received: 20 December 2021 | Revised: 15 February 2022 | Accepted: 17 February 2022
DOI: 10.14814/phy2.15220

ORIGINAL ARTICLE

Physiological Reports

Muscular tension as an indicator of acute stress in horses

Ellen M. Rankins[1] | Helio C. Manso Filho[2] | Karyn Malinowski[1] | Kenneth H. McKeever[1]

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

Correspondence
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 4×4 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

FI: 2,47

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.

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. McKeever[1*], H.C. Manso Filho[2], E.M. Rankins[1], C.S. Duchamp[1], Y. Salah[1], C.K. Fenger[3], W.C. Duer[4], K. Malinowski[1] and G.A. Maylin[5]

[1]Equine Science Center, Department of Animal Science, Rutgers – The State University of New Jersey, 84 Lipman Drive, New Brunswick, NJ 08901, USA; [2]Federal Rural University of Pernambuco, Rua Dom Manuel de Medeiro, 52171-900 Recife, PE, Brazil; [3]Equine Integrated Medicine, PLC, 4904 Ironworks Rd., Georgetown, KY 40324, USA; [4]Duer Forensic Toxicology LLC., 1621 Gulf Blvd #102, Clearwater, FL 33767-2928, USA; [5]New York Drug Testing and Research Program, Morrisville State College, 777 Warren Rd, Ithaca, NY 14853, USA; *mckeever@sebs.rutgers.edu

Received: 8 September 2020 / Accepted: 29 September 2020

OPEN ACCESS RESEARCH ARTICLE

Abstract

Clenbuterol, (*RS*)-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 (Wilsher *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 (Couëtil *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

animals

MDPI

Article

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

Clarisse S. Coelho [1], Ticiane D. R. F. Sodre [2], Lara N. Sousa [2], Renata F. Siqueira [3], Helio C. Manso Filho [4], Francesca Aragona [5] and Francesco Fazio [6,*]

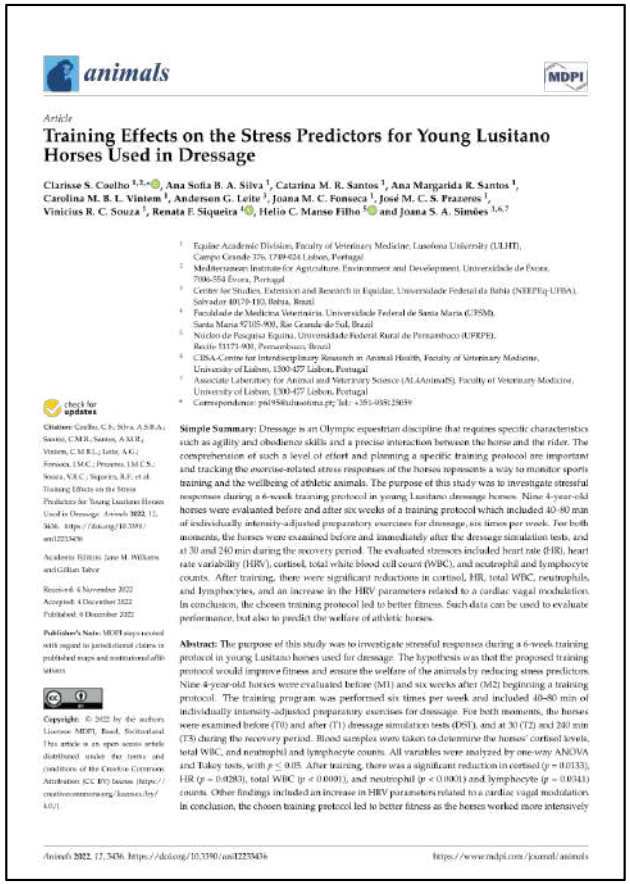
animals

MDPI

Article

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

Carolina J. F. L. Silva [1], Keity L. G. Trindade [1], Raissa K. S. Cruz [1,2], Helena E. C. C. C. Manso [1], Clarisse S. Coelho [3,4], José D. Ribeiro Filho [5], Carlos E. W. Nogueira [6], Francesca Aragona [7], Francesco Fazio [7,*] and Helio Cordeiro Manso Filho [1]



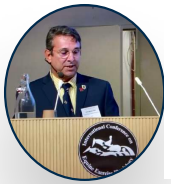
animals

MDPI

Article

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

Clarisse S. Coelho [1,2,*], Ana Sofia B. A. Silva [1], Catarina M. R. Santos [1], Ana Margarida R. Santos [1], Carolina M. B. L. Vintem [1], Anderson G. Leite [1], Joana M. C. Fonseca [1], José M. C. S. Prazeres [1], Vinicius R. C. Souza [1], Renata F. Siqueira [4], Helio C. Manso Filho [4] and Joana S. A. Simões [3,6,7]



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FI: 3,23

Other internationalization actions in 2021-2022

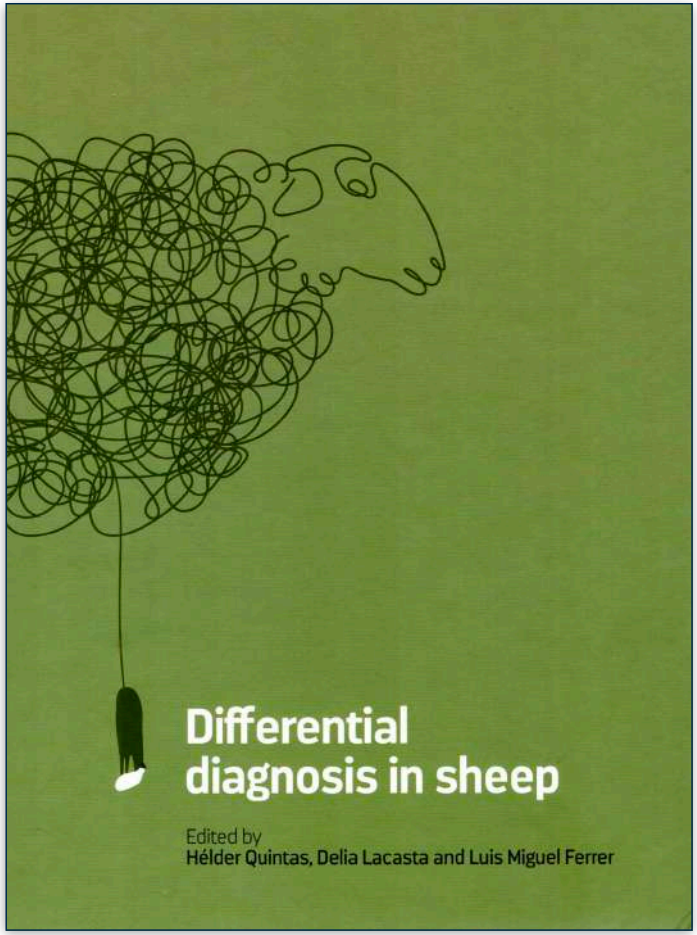
UNIVERSIDADE FEDERAL RURAL DE PERNAMBUCO

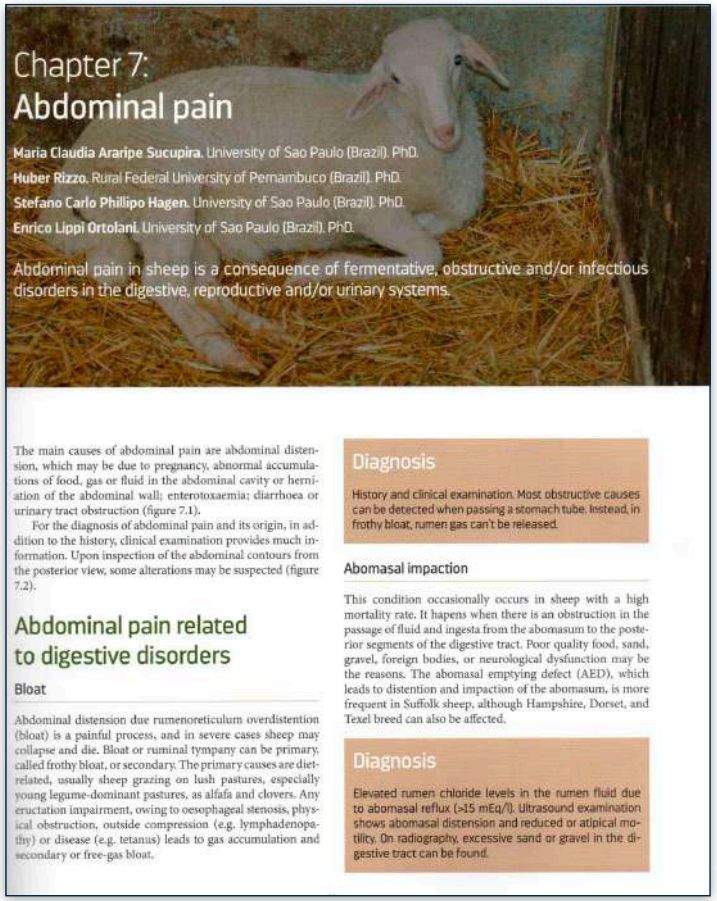
PPGMV PROGRAMA DE PÓS-GRADUAÇÃO EM MEDICINA VETERINÁRIA UFRPE

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 Phillipo 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 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 alfafa 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 hapens 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 atipical motility. On radiography, excessive sand or gravel in the digestive tract can be found.

Junta de Castilla y León

Other internationalization actions in 2021-2022

UNIVERSIDADE FEDERAL RURAL DE PERNAMBUCO

PPGMV PROGRAMA DE PÓS-GRADUAÇÃO EM MEDICINA VETERINÁRIA UFRPE

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**

Dr. Huber Rizzo
UFRPE-PPGMV

Other internationalization actions

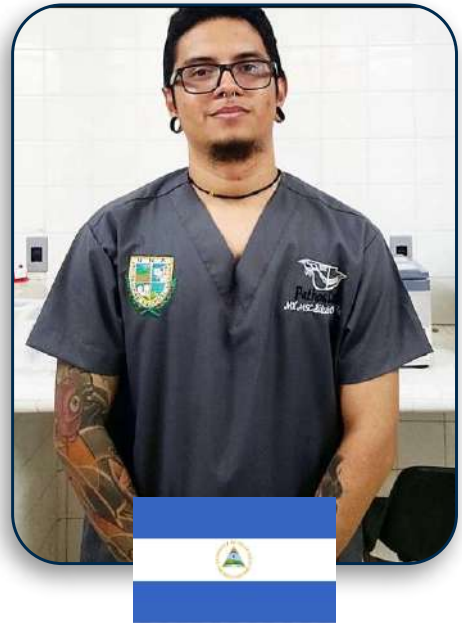
Foreign students:

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** Food Systems	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

*not executed / extended due to COVID 19

Project approved by CAPES-PRINT/UFRPE* – 2023

UNIVERSIDADE FEDERAL RURAL DE PERNAMBUCO

PPGMV PROGRAMA DE PÓS-GRADUAÇÃO EM MEDICINA VETERINÁRIA UFRPE

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.

UCDAVIS VETERINARY MEDICINE
California Animal Health & Food Safety Laboratory System

*not executed / extended due to COVID 19

APPROVED

Project approved by CAPES-PRINT/UFRPE* – 2023

UNIVERSIDADE FEDERAL RURAL DE PERNAMBUCO

PPGMV PROGRAMA DE PÓS-GRADUAÇÃO EM MEDICINA VETERINÁRIA UFRPE

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.

UCDAVIS VETERINARY MEDICINE
California Animal Health & Food Safety Laboratory System

*not executed / extended due to COVID 19

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PPGMV
PROGRAMA DE PÓS-GRADUAÇÃO EM MEDICINA VETERINÁRIA
UFRPE

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

UNIVERSIDADE FEDERAL RURAL DE PERNAMBUCO

Annual Action Plan 2023-2024

PPGMV
PROGRAMA DE PÓS-GRADUAÇÃO EM MEDICINA VETERINÁRIA
UFRPE

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