SUSPECTED MARSH MALLOW (MALVA PARVIFLORA) TOXICITY CAUSING MYOCARDIAL DISEASE AND MYOPATHY IN FOUR HORSES. J. Bauquier[1], A. Stent[1], J. Gibney[2], I. Jerrett[2], B. Tennent-Brown[1], A. Pearce[3], J. Pitt[4]. [1]Faculty of Veterinary and Agricultural Sciences, University of Melbourne, Werribee, Victoria, Australia, [2]Victorian Department of Environment and Primary Industries, Bundoora, Victoria, Australia, [3]Golden Plains Equine, Bannockburn, Victoria, Australia, [4]Victorian Clinical Genetics Services, Royal Children's Hospital, Melbourne, Victoria, Australia

Four horses from the same farm were examined on sequential days for acute onset of severe muscle fasciculations, tachycardia, sweating and periods of recumbency. All were kept in a paddock with minimal pasture coverage but extensive growth of *Malva parviflora*, which they were grazing. Feed supplementation was minimal. Horse 1 was euthanized on the farm due to rapid clinical deterioration. Horse 2 was referred for hospital care where it was determined to have severe myocardial disease and generalised myopathy; this horse was euthanized due to prolonged recumbency and severe cardiac arrhythmias 36 h after admission. Horse 3 died during transport to hospital, and horse 4 was euthanized at onset of clinical signs. Post mortem examinations performed on horses 2, 3 and 4 revealed acute, multifocal, monophasic myonecrosis of cardiac and skeletal muscle. Myocyte glycogen accumulation was absent (PAS stain; horse 2). Acyl carnitine profiles were performed on serum from horses 2 and 4 and equine controls. These revealed increased C14-C18 acyl carnitines in cases relative to controls. Malvalic, sterculic, and dihydrosterculic acids (present in *Malva parviflora*) were grossly increased in sera of cases relative to controls. The prominent cardiac component and different acyl carnitine profile suggests a different aetiology to atypical/seasonal pasture myopathy. We hypothesise that these cyclopropene fatty acids found in *Malva parviflora* interfere with fatty acid beta-oxidation in horses in negative energy balance, causing the clinical signs and abnormal acyl carnitine profiles. These equine cases closely resemble the human genetic condition Very Long Chain Acyl CoA Dehydrogenase Deficiency.

PRELIMINARY VALIDATION STUDY OF PARAOXONASE-1 IN HORSES. F. Bonelli[1], M. Sgorbini[1], A. Giordano[2], S. Paltrinieri[2]. [1]Department of Veterinary Sciences, San Piero a Grado (PI), Italy, [2]Department of Veterinary Sciences and Public Health, Milan, Italy

Paraoxonase-1 (PON-1) is an anti-oxidant enzyme associated with high-density lipoproteins in blood. PON-1 is a negative acute-phase protein being its plasmatic activity reduced during inflammation due to consumption by oxidants. Considering the possible clinical usefulness of PON-1 as an early inflammatory marker this is a preliminary validation study in horses.

Serum PON-1 activity was measured in 69 clinically healthy animals (31 adult female, 18 geldings, 11 stallions, 9 foals) using an enzymatic method adapted from other species. In order to preliminarily assess the possible utility of PON-1 as a marker of Systemic Inflammatory Response Syndrome (SIRS), blood from 6 sick foals, classified according to a validated SIRS scale, was analyzed. Intra- and inter-assay imprecision were assessed by repeated analysis of pooled samples and evaluation of coefficient of variations (CV). Accuracy was indirectly evaluated through linearity under dilution (LUD) and spiking recovery test (SRT). Results of the different groups of healthy horses were compared to each other with a Friedmann test with Bonferroni correction. The method is precise (inter- and inter-assay CVs <5%) and accurate (LUD and SRT fit the linear model). PON-1 activity was higher in foals and in adult females (mean $\pm$ SD: 63.7 ± 15.5 and 60.8 ± 10.1, respectively) than in geldings and adult males (52.5 ± 10.2 and 47.2 ± 7.7, respectively). In 3/6 SIRS foals PON-1 activity was lower than the lowest percentile of distribution of healthy foals. This study demonstrated that the method of measurement of PON-1 activity in horses is precise and accurate and PON-1 may be a marker of SIRS.

ANTIMICROBIAL USE BY EQUINE PRACTITIONERS IN GERMANY AUSTRIA AND SWITZERLAND. J. Schwechler[1], R. van den Hoven[2], A. Schoster[1]. [1]Equine Department, Vetsuisse Faculty, University of Zurich, Zurich, Switzerland, [2]Clinic for Equine Internal Medicine, University of Veterinary Medicine Vienna, Vienna, Austria

Antimicrobial resistance is a growing concern and associated with antimicrobial use. Data from several countries has shown that inappropriate use of antimicrobials is common among equine practitioners. The objective of this study was to investigate the antimicrobial prescribing practices of equine practitioners in Austria, Germany and Switzerland.

An online questionnaire including six clinical scenarios was sent to all members of the equine veterinary associations of Germany, Switzerland and Austria. Antimicrobial choice and dosage were compared to each country's licensing bodies and current published scientific guidelines. To establish association of demographic factors with use of critically important antimicrobials and underdosing, logistic regression analysis was performed.

Antimicrobials were prescribed for diseases with an unlikely bacterial origin by 36–84% of respondents, of which 8–12% selected a critically important antimicrobial. Use of third or fourth generation cephalosporins was associated with type of practice ($P = 0.03$) and number of veterinarians employed ($P = 0.04$) and fluorquinolone use was associated with number of veterinarians employed in the practice ($P = 0.02$). Underdosing occurred in 15/130 (12%) when the dose was compared to the licensed dose rates and when compared to current scientific guidelines underdosing was practiced by the majority (72%) of the respondents.

Inappropriate use of antimicrobials was common, and critically important antimicrobials were chosen as fist line antimicrobials by practitioners in Germany, Switzerland and Austria. Underdosing is a common problem caused by the fact that the scientific guidelines do not match with the mostly lower dosages approved by the licensing authorities.

DEVELOPMENT AND VALIDATION OF AN EQUINE CORONAVIRUS ELISA TO DETERMINE SEROLOGICAL RESPONSES IN NATURALLY INFECTED HORSES. L.J. Kooijman[1], S.M. Mapes[2], N. Pusterla[2]. [1]Department of Equine Sciences, Faculty of Veterinary Medicine, Utrecht University, Utrecht, The Netherlands, [2]Department of Medicine and Epidemiology, School of Veterinary Medicine, University of California, Davis, CA, USA

Equine coronavirus (ECoV) has recently been implicated in several outbreaks of lethargy, anorexia and fever among adult horses. The purpose of this study was to develop and validate an Enzyme-Linked Immuno-Sorbent Assay (ELISA) targeting antibodies to the spike (S) protein of ECoV. Acute and convalescent serum samples from 83 adult horses involved in 6 different outbreaks were used. An ELISA starter accessory kit, the purified ECoV S-protein and anti-horse IgG were used for this purpose. Optical density (OD) values from the field samples, as well as from our positive and negative control samples, were obtained using the ELISA. The ELISA was able to reliably and repeatedly classify negative and positive control serum samples. The average corrected threshold OD was determined to be 0.955 with a standard deviation of 0.227. The assay was found to be linear over an OD range of 0.557–3.487. Intra-assay coefficient of variation ranged from 0.8 to 6.4%, with an average of 3.1%. The inter-assay coefficients of variation ranged from 1.9 to 4.2%, with an average of 3.0%. The greatest seroconversion rate was observed in horses with clinical signs compatible with ECoV and ECoV qPCR detection in feces. Results showed that the ECoV ELISA is able to reliably detect antibodies to ECoV and could therefore be a valuable tool to diagnose and monitor ECoV outbreaks in the future.