IVM in the LMIT before treatment on those farms where insufficient reduction of egg counts in the FECRT were observed, compared with those farms, where complete FECR was recorded. This demonstrates that the established LMIT might be suitable for the detection of emerging resistance. The prevalence of C. oncophora present after treatment on more than 70% of the tested farms in Germany suggests that reduced efficacy of IVM might be a still underestimated problem in European cattle stocks.

CS21.4

Faecal Egg Count Reduction Test (FECRT): Arithmetic or Geometric Means?

Dobson, Robert J.[1]; Sangster, Nick C.[2]; Besier, Robert B.[3]; Woodgate, Robert G.[3]

1. Murdoch University Veterinary Science, Murdoch, WA, Australia; 2. School of Animal & Veterinary Sciences, Charles Sturt University, Wagga Wagga, NSW, Australia; 3. Department of Agriculture & Food WA, Albany, WA, Australia

The process of conducting a faecal egg count reduction test was simulated to examine whether arithmetic or geometric means offer the best estimate of efficacy. By assuming a known drug efficacy, distribution and mean of worm counts we drew random samples from the hypothetical population, to estimate efficacy using arithmetic or geometric means for comparison with the known efficacy. Two components of sample variation were simulated: the counts of individual hosts selected from the general population was modelled by the negative binomial distribution with varying degrees of aggregation; for eggs found in an aliquot of faeces used to estimate the worm egg count a Poisson distribution was assumed. To determine the geometric mean a constant(C) must be added to all counts if the dataset contains zeros but different Cs can provide substantially different efficacy estimates, C was set to 25, 12 or 1. Ten thousand separate efficacy trials to estimate mean efficacy and its 95% confidence limits based on arithmetic or geometric means were simulated. Arithmetic means best estimated efficacy for all different levels of worm aggregation in the host population. For moderate levels of aggregation and with C=1 the geometric mean substantially overestimated efficacy. The bias was reduced if C was increased to 25 but the results were no better than those based on arithmetic means. For very high levels of aggregation (over-dispersed populations) the geometric mean underestimated efficacy regardless of the size of C. Arithmetic means offered the simplest and least biased way to estimate efficacy.

CS21.5

Use of Box-Cox Transformation Technique for Fitting Fecal Egg Count Observations in a Cattle Population

Gasbarre, Louis C.[1]; Silva, Marcos V.[2]; Sonstegard, Tad S.[1]; Van Tassell, Curtis P.[1]

1. USDA, Bovine Functional Genomics Lab, Beltsville, MD, USA; 2. Embrapa Dairy Cattle, Juiz de Fora, Brazil

Fecal egg count (FEC) is used to identify and quantify gastrointestinal parasite infestations. FEC values are not "normally" distributed and a small percentage of the herd is responsible for the majority of parasite transmission. In an attempt to bring FEC distribution close to normality, logarithmic transformations have been used for these data. Unfortunately, normalization of the distribution is not achieved in the majority of the cases, resulting in the necessity of using less sensitive non-parametric statistics analyses, and the inability to fit the data into more complex genetic analyses. In this study we compared an extension of the Box-Cox transformation to determine the efficiency of this transformation compared to log transformation. Between 1992 and 2006, 12,450 observations of FEC were collected from 498 animals (males and females) from the BARC Angus herd. Contemporary group was defined as animals entering in experiment together. There were 19 contemporary groups in the study. The statistical model used in ANOVA included the contemporary groups, sex of the animal and age at test, as fixed effect, and error, as random effect. Results show that Box-Cox transformation reduced coefficients of asymmetry in all the variables studied. Plotting the residuals (stem-leaf and Normal plot graphs for normal distribution and box-plot for homogeneity of variance) for each trait and checking the parameters of the normal distribution and homogeneity of variance, Box-Cox was always superior to log. As the log transformation is a special case of the Box-Cox, this transformation will be, at least, equal to log, never worse.

CS21.6

Monitoring the Efficacy of Anthelmintic Drugs in Small Ruminants in the State of São Paulo, Brazil: Preliminary Results

Veríssimo, Cecília J.[2]; Méo, Simone C.[3]; Oliveira, Daniel C.[2]; Curci, Vera M.[2]; Ueno, Tatiana H.[2]; Rodrigues, Carlos C.[2]; Costa, Ricardo D.[2]; Pereira, José R.[2]; Margatho, Luiz Florêncio F.[2]; Chiebao, Daniela P.[2]; Molento, Marcelo Beltrao[1]

1. UFPR, Curitiba, Brazil; 2. APTA, Sao Paulo, Brazil; 3. Embrapa/CPPSE, São Carlos, Brazil

The sheep and goat industry in the state of São Paulo (SP) is relatively new with animals, and their parasites, coming from many parts of Brazil without previous drug history. Producers have focus on meat producing animals with large investment. Helminths, mainly Haemonchus sp., Trichostrongylus