

Comparing pooled with individual faecal samples for the assessment of gastrointestinal strongyles infection burden in goats

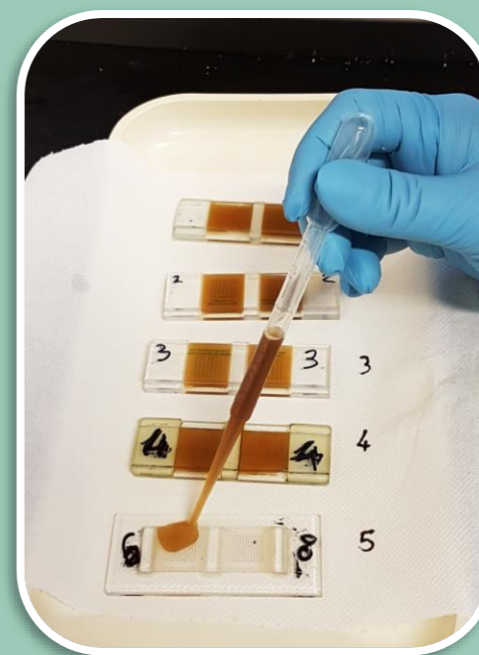
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INTRODUCTION

Gastrointestinal strongyles (GIS) are a well-known problem for goats and their burden is typically monitored by faecal egg counts (FECs). Pooled samples can be used to reduce time and cost of the analyses, but they are less informative than individual FECs. This study aimed to compare the results obtained with pooled and individual FECs in goats, in order to evaluate whether significant differences exist between the two approaches.



MATERIALS AND METHODS

The study involved 11 farms located in Veneto and Friuli-Venezia Giulia. A total of 285 individual faecal samples were collected between November 2018 and September 2019 from the rectum of goats and 50 pools were composed thoroughly mixing 5 grams of faeces from 3-8 animals, according to the housing partition of the flock. FECs were performed for GIS on both individual and pooled samples by a modified McMaster method. A permutation test (100.000 iterations) based on Pearson correlation was performed in the statistical software R to verify the agreement between FECs from pools and average FECs from corresponding individual samples. For the latter it was also possible to estimate a 95% confidence interval, calculated as in Maurizio et al., 2021, Vet.Sci. 8, 69.

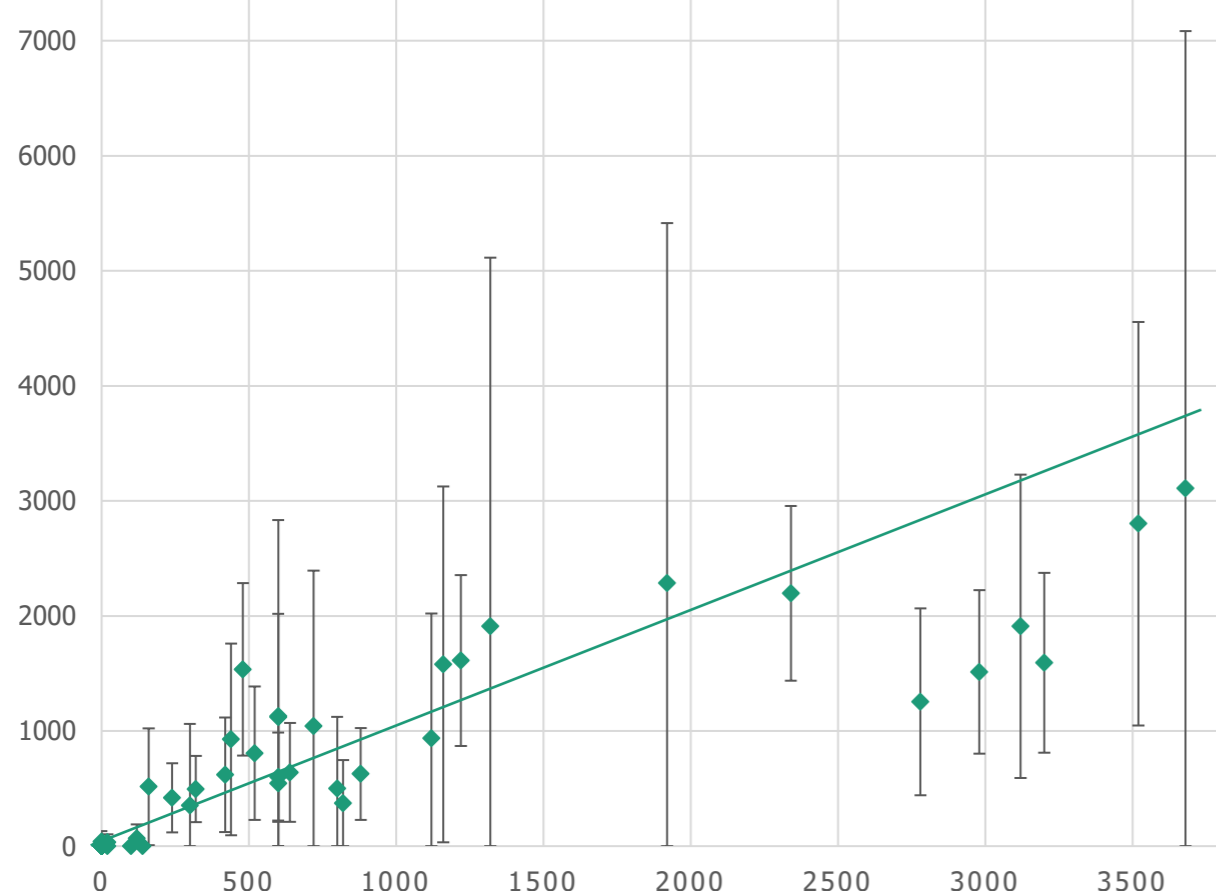


Figure 1. Correlation between eggs per gram of faeces (EPG) of pooled (x-axis) and individual (y-axis) FECs. Error bars represent 95% confidence intervals. The line of equality is indicated in blue.

RESULTS AND CONCLUSIONS

Pooled FECs were highly and positively correlated to individual counts, with a correlation coefficient $r=0.88$ ($p<0.001$). However, a tendency of pools to overestimate the abundance for high emission levels was recorded, in contrast with previous findings in sheep (Rinaldi et al., 2014, Vet. Parasitol. 205, 216-223), as well as a tendency to underestimate it for lower egg outputs (Fig.1). Furthermore, individual samples provided information about the heterogeneity of the sample, which significantly affected, at times (wide intervals), the interpretation of the egg output. In conclusion, while this study confirmed the validity of analysis based on pooled samples, it also highlighted they hold intrinsic limits that should not be ignored nor overlooked.