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DOES FELINE ROTAVIRUS CONTRIBUTE TO THE ECOLOGY OF HUMAN ROTAVIRUS?

- Rotaviruses are associated with acute gastroenteritis in people and animals.
- A high degree of genetic homology has been reported for certain feline and human strains^[1-6]
- Infection in cats is poorly understood and clinical signs are inconsistent^[7-10]
- The close association between pet cats and people may have important epidemiological and ecological consequences.
- Rescue catteries provide a valuable population to study the diversity and evolution of rotavirus because
 - Stress associated with relinquishment and rehoming affect shedding
 - Transmission opportunities change between individuals and large populations

HOW WAS ROTAVIRUS DETECTED?

- Detection and genotyping of rotavirus**
 - 10% faecal suspensions, clarified by centrifugation
 - RNA extraction (QIAamp viral RNA kit, Qiagen), prior to reverse transcription
 - Rotavirus NSP3-specific qPCR, quantified as copies per reaction against a titrated simian reference strain
 - The limit of detection for the NSP3 qPCR assay was 30 copies (**Figure 3**)
 - Positive samples screened for faecal antigen using a commercial kit (Rotaclone, Meridian Biosciences)
 - Rotavirus strains were genotyped using nested PCR assays for VP4 and VP7
- Rotavirus prevalence**
 - Rotavirus prevalence was calculated for the total population and for positive centres

AIMS

- TO DETERMINE THE PREVALENCE OF ROTAVIRUS EXCRETION IN UK RESCUE CATS
- TO CHARACTERISE CIRCULATING STRAINS OF FELINE ROTAVIRUS

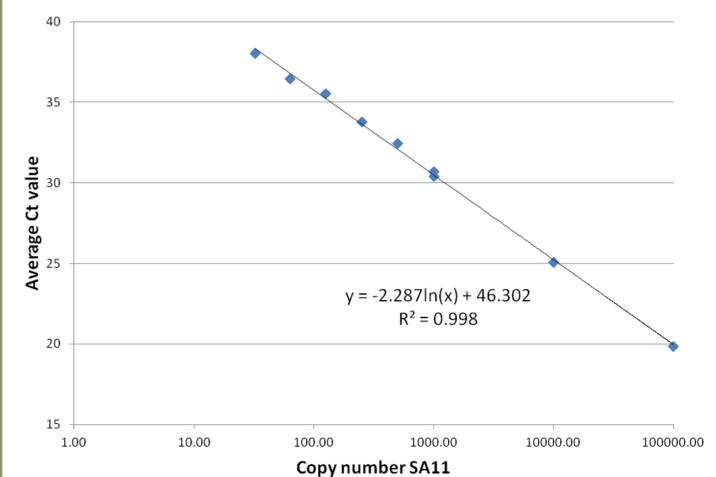


HOW WERE SAMPLES COLLECTED?

- Cat population**
 - 25 Cats Protection Adoption Centres from across the UK (**Figure 1**)
 - All kittens and a random sample of adult cats
 - Winter and Summer collection periods to account for change in demographics (**Figure 2**)
- Faecal samples**
 - 619 samples from 12 centres, collected February-March 2012 (winter) from litter trays
 - Pen as the sampling unit
 - Faecal consistency assessed using a six point scoring system^[11]
 - Sample size allowed 95% probability of detecting faecal shedding in one pen if the prevalence of infection was 2%, test sensitivity 95% and test specificity 100%
 - Samples were kept at 4°C until storage at -80°C



Figure 3: Correlation between copy number and Ct value for dilutions of rotavirus reference strain SA11



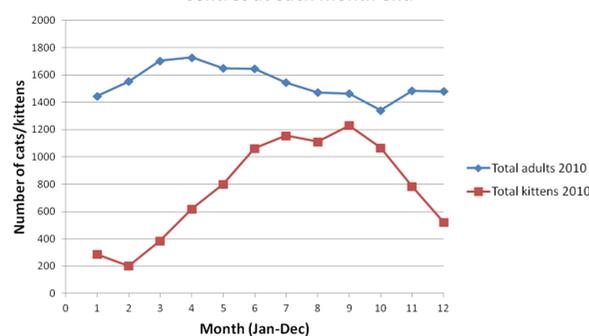
FELINE ROTAVIRUS HAS LOW PREVALENCE

- The prevalence was 0.97% (95% CI 0.4-2.1%)
- Rotavirus was detected in 4 of the 12 centres; a centre prevalence of 33.3% (95% CI 9.9-65.1)
- The prevalence of rotavirus within centres varied from 0 – 3.33% (95%CI 0-17.2%)
- 6 rotavirus positive samples were identified; all were from adult cats; only one cat had diarrhoea (**Table 1**)
- The two rotaviruses genotyped were both **Group A, G3P[9]**, from the same adoption centre.
 - Both G3 & P[9] types are epidemiologically relevant for cats and people
- The majority of cat faeces (60%) were normal consistency (grade 5) (95% CI 55.8-64.0)
- 9.6% cats had diarrhoea (grade ≤3) (95% CI 7.32-12.3)
- 10% cats were constipated (grade 6) (95% CI 7.6-12.7)

Figure 1: Distribution of Cats Protection Adoption Centres in the UK. Blue boxes indicate winter collection.



Figure 2: Total cats and kittens within CP Adoption Centres at each month end



Centre	No. Samples collected	Ct	Copy number	Genotype
1	65	36.18	83.59	ND
2	30	38.02	37.39	ND
3	69	38.95	24.90	ND
4	99	29.63	1465.42	G3P[9]
4	99	31.43	667.03	G3P[9]
4	99	30.07	1208.95	ND

Table 1: Molecular results for rotavirus positive samples

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CONCLUSIONS AND FUTURE WORK

- Feline rotavirus has low prevalence over the winter months in UK shelter cats. Why?
 - The small proportion of kittens in the population?
 - Good hygiene?
 - Feline behaviour as a method of disease control, as queens eat their kittens' faeces until five weeks of age?
- Analysis for the summer faecal collection (high proportion of kittens) is currently underway
- G3P[9] has been identified; further genotyping and whole genome sequencing will clarify any relationship with human strains