

Occurrence of hepatitis E virus in pig livers, faeces and serum at the time of slaughter, Spain, 2020-21.

Main author: Jorge Santamaría-Palacios (Burgos University)

Co-authors: Lorena Casado-Martín, Carmen Bárcenas, María Hervás-Tejedor, Nerea García-Benzaquén, Joaquín Goyache, David Rodríguez-Lázaro

INTRODUCTION

Zoonotic hepatitis E is considered to be an emerging foodborne disease in Europe. Human cases associated with the foodborne route have increased in the last decade, especially those associated with pork. The objective of this study is to investigate the presence of HEV in the serum, faeces and liver of pigs at the time of slaughter, on the basis of a representative sample of pig production in Spain. The presence of HEV in wastewater from slaughterhouses is also investigated.

METHODOLOGY

Representative samples of blood, faeces and liver were taken from 362 pigs at the time of their slaughter. Wastewater samples from the slaughterhouses were also collected (n = 7). A sample process control virus (SPCV), Murine Norovirus-1 (MNV-1), was added to all samples just before testing began. Different protocols were used for concentration, and the RNA extraction was performed using commercial kits. The presence of HEV RNA was detected and quantified by RT-qPCR. As a positive control, the HEV standard of the Paul Ehrlich Institut (Germany) was used. The SPCV was also evaluated via RT-qPCR. Samples with a CT value lower than 40 were considered to be positive. In all samples with a positive result, a retrotranscription of the extracted RNA was performed, and the resulting DNA was stored at -80°C for future sequencing.

RESULTS

HEV RNA was detected in 6 (85,7 %), 19 (6,2 %), 122 (33,7 %), and 64 (17,7 %) in wastewater, serum, faeces, and liver samples, respectively. n=7, 307, 362 and 362 in wastewater, serum, faeces and liver samples, respectively. HEV RNA was quantified using the Paul Ehrlich institute HEV standard (6329/10) as reference material, estimated at 250,000 International Units/ml.

DISCUSSION

Our findings are consistent with those of a previous study carried out by members of our research team, in which a smaller population of pigs was sampled ($n = 45$) – for both serum and liver samples. However, the percentage of positive samples was higher in the faeces samples in comparison with the previous study (6/45, 13.3 %). This difference may be due to the fact that the current study has expanded the number of samples in order to achieve a nationwide representation of pig production. The fact that almost all wastewater samples are positive indicates the wide prevalence of HEV in pigs. In conclusion, at the time of slaughter, HEV could be present in pig liver, active excretion of the virus could be taking place (HEV RNA found in faeces), and even in some cases, pigs could display viremia (HEV found in serum).