PEDv in the Literature

Survivability of porcine epidemic diarrhea virus (PEDV) in bovine plasma submitted to spray drying processing and held at different time by temperature storage conditions

Joan Pujols Joaquim Segales

Bovine plasma was inoculated with porcine epidemic diarrhea virus (PEDV) at an average final titer of 4.2 log10 TCID50/mL to determine the effect of spray drying on viral inactivation. Using a laboratory scale drier, inoculated plasma was spray dried at 200°C inlet temperature and either 70 or 80°C throughout substance. Both liquid and dried samples were subjected to three passages on VERO cell monolayers to determine PEDV infectivity. Results indicated liquid samples contained infective virus, but none of the spray dried samples were infectious. Also, survivability of PEDV inoculated on spray dried bovine plasma (SDBP) and stored at 4, 12 or 22°C was determined for 7, 14 and 21 days. Commercial SDBP powder was inoculated with PEDV to an average final titer of 2.8 log10 TCID50/g. Five samples per time and temperature conditions were subjected to three passages on VERO cell monolayers to determine PEDV infectivity. The virus was non-infectious for all samples stored at 22°C at 7, 14 and 21 days. PEDV was infective in 1 out of 5 samples stored at 12°C at 7 days, but none of the samples stored for 14 and 21 days were infectious in cell culture. For samples stored at 4°C, 4 out of 5 samples were infectious at 7 days, 1 out of 5 samples were infectious at 14 days, but none were infectious at 21 days. In summary, PEDV was not infectious on cell culture within 7 days when stored at room temperature and within 21 days when stored at refrigerated temperature.

Spray drying condition	Inoculated liquid plasma PEDV $TCID_{50}$/mL	Spray-dried plasma PEDV $TCID_{50}$/g
70°C throughout substance	4.2±0.2 log10 (Ct:13.9±0.3)	Not detected (Ct: 23.3±0.6)[b,c]
80°C throughout substance	4.2±0.2 log10(Ct:13.9±0.3)	Not detected (Ct: 23.8±0.8)

Table 1

[a] **Data represents the mean PED virus isolation results of triplicate analysis of three lots per liquid and spray dried condition that had been subjected to three serial passages on VERO cell monolayers.**

[b] **The spray dryer concentrated liquid plasma 10 times; the expected virus titre in the dry product was 5.15±0.2 log10 TCID50/g**

[c] **The theoretical limit of detection of the method used was estimated to be able to detect as low as 0.7 viral particles/g**

Article citation & web address to publication:
Pujols, J., Segal´es, J.,Survivability of porcine epidemic diarrhea virus (PEDV) in bovine plasma submitted to spray drying processing and held at different time by temperature storage conditions, Veterinary Microbiology (2014), http://dx.doi.org/10.1016/j.vetmic.2014.10.021

Editor's comment: *This article is an important addition to the material already generated by research groups on the potential for contaminated spray dried plasma to infect pigs. There are farms in both Canada and the US that are strongly suspected by their veterinarians to have been infected with PEDv via contaminated feed products, specifically spray dried porcine plasma. The article directly compares cell culture of similar dilutions of virus in liquid plasma: one set of samples left in liquid form and one set processed with spray drying. The results suggest that given the efficacy of the spray-drying process it is very unlikely that plasma contaminated prior to spray-drying would be able to infect a herd. This indicates that a more likely method of contamination of feed products is contamination along transportation routes or during the mixing process rather than directly from the carcasses at processing.*