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This project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No 862829.

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EFFECTS OF EARLY POSTNATAL FAECAL TRANSPLANTATION ON HEALTH AND GROWTH OF PIGS

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Introduction & Aim

- Early life morbidity and mortality in pigs are high and partly related to infectious diseases, such as enterotoxigenic *Escherichia coli* (ETEC) diarrhoea[1]
- It is suggested that early postnatal microbial colonization of the gut determines later stability and robustness of the gut[2]
- Faecal transplantation refers to transfer of a faecal suspension from a healthy donor into a recipient to reshape the intestinal microbiota[3]
- Our aim was to investigate if transplantation of faecal matter from healthy suckling piglets to newborn recipients would provide a beneficial gut colonization and prevent diarrhoea in early life

Study design

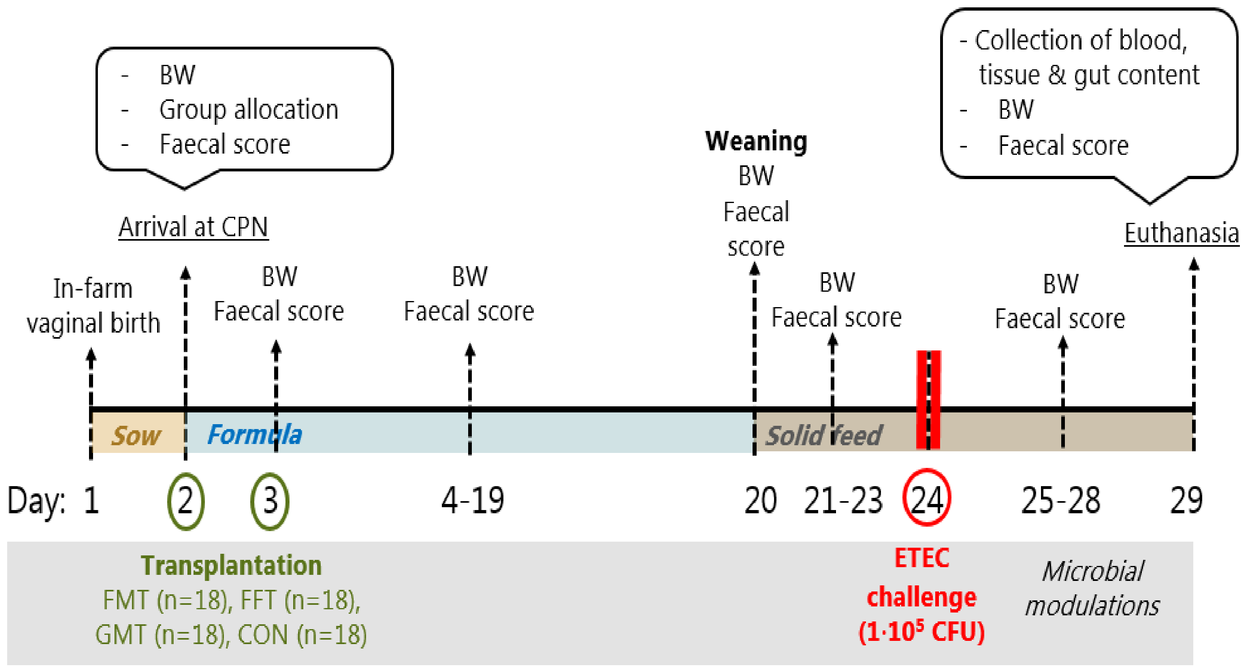

Figure 1: Schematic study overview, BW = body weight, ETEC = enterotoksinogenic *E. coli* F4ac
72 one-day-old vaginally born, colostrum immunized, term piglets were randomly allocated to one of four oral transplantation groups; GMT, FMT, FFT and CON.

Intervention material

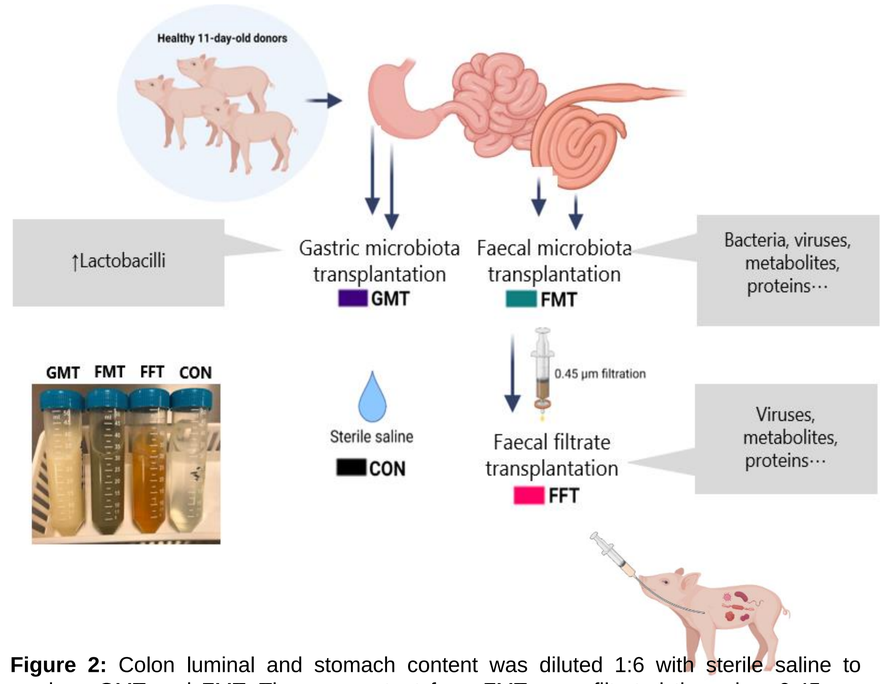

Figure 2: Colon luminal and stomach content was diluted 1:6 with sterile saline to produce GMT and FMT. The supernatant from FMT were filtrated through a 0.45 µm syringe filter to produce FFT. The GMT, FMT and FFT groups received 1 g. of origin content and the CON group received equivalent volumes of sterile saline per treatment.

Results

FFT showed:

- A lower diarrhoea prevalence on day 28 and 29 of life compared to controls (Fig. 3)

Groups were similar in:

- Growth (Fig. 4)
- Small intestinal morphology (Fig. 5)
- Gut enzymes activities (Fig. 6)
- Blood cytokines, biochemistry (Fig. 7) and haematology
- Organ weights

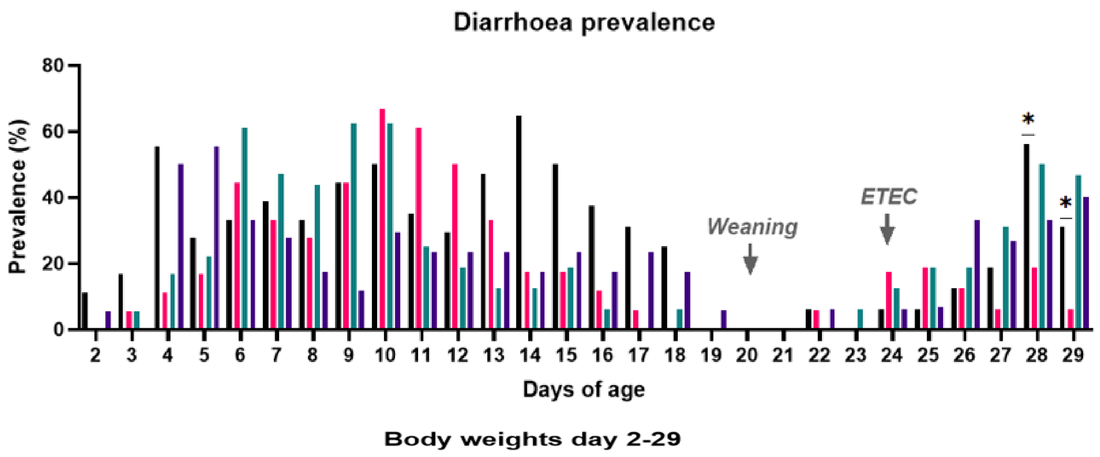

Figure 4: Effect of different early interventions on growth from day 2-29. All values are presented as means ± SD, n = 16-18

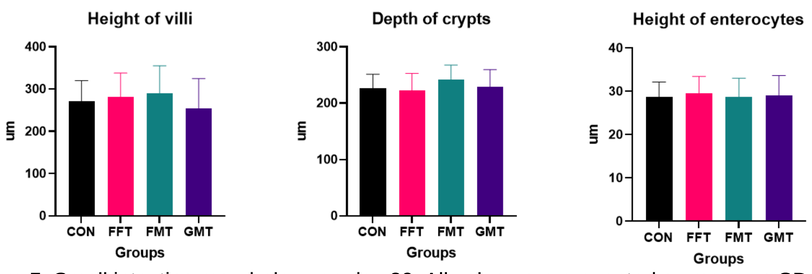

Figure 5: Small intestine morphology on day 29. All values are presented as means ± SD, n = 16-18

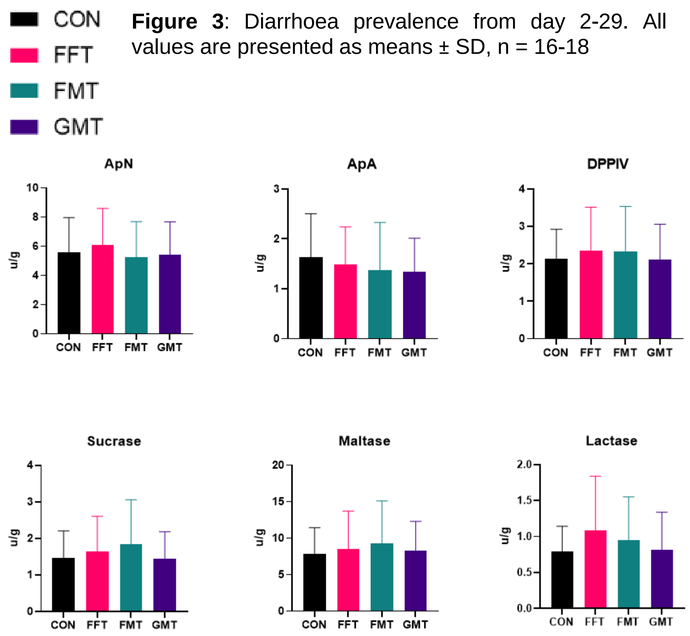

Figure 3: Diarrhoea prevalence from day 2-29. All values are presented as means ± SD, n = 16-18

Figure 6: Gut enzyme activities on day 29. All values are presented as means ± SD, n = 16-18

Figure 7: Biochemistry on day 29. All values are presented as means ± SD. n = 16-18

Conclusion

Frequent episodes of diarrhoea in the single housed pigs may have influenced the effect of the interventions. Only FFT showed potential in reducing ETEC-related post-weaning diarrhoea.

References: 1. Dubreuil, J. D. ASM J. 2016; 7: 1-47, 2. Dou, S. PLoS ONE 2017; 1-20. 3. Khoruts, A. and Sadowsky, M. J. Nat. Rev. Gastroenterol. Hepatol 2016; 13: 508-516

Abstract number: P153