Effect of β-glucans on net fluid absorption in enterotoxigenic *E.coli*-infected small intestinal segments of weaned piglets. J. van der Meulen[1], A.J.M. Jansman[*1], J.J. Mes[2], I.M. van der Meer[3], M.M. Hulst[1], *[1]Wageningen UR Livestock Research, Lelystad, the Netherlands, [2]Agrotechnology & Food Sciences Group of Wageningen University and Research Centre, Wageningen, The Netherlands, [3]Plant Sciences Group of Wageningen University and Research Centre, Wageningen, The Netherlands.*

β-Glucans are known as immunostimulants. In the pig, β-glucans are not enzymatically hydrolysed in duodenum and jejunum but may be fermented in the ileum and hindgut. In this way, they may modulate the gut flora and its fermentation activity, ultimately possibly influencing gut morphology and mucosal immune response. β-Glucans may also have antiviral and antibacterial properties. Enterotoxigenic *E. coli* (ETEC) infection is a major cause of diarrhea in early-weaned piglets. This study investigated whether β-glucans isolated from Lentinus edodus (lentinan), Ganoderma lucidum (ganoderma), Alcaligenes faecalis (curdlan) and Avena sativa (oats) are able to reduce ETEC-induced loss in fluid absorption in the small intestinal segment perfusion (SISP) model. In four 5-wk-old anaesthetized piglets, 4 pairs of jejunal segments (a non-infected and an adjacent ETEC-infected) were perfused over 8 h with 4 g/L β-glucans from lentinan, ganoderma, curdlan and oats with saline as control in another pair of segments. After perfusion mucosal tissue samples were taken for analysing pancreatitis-associated protein (PAP) expression as biomarker for infection. Net fluid absorption was calculated from the difference between the volumes of inflow and outflow divided by the surface area of the segments. Absorption of net fluid, sodium, potassium and chloride in non-infected segments was significantly higher ($P < 0.05$) than in ETEC-infected segments. There was no effect of any of the tested β-glucans on net fluid and electrolyte absorption in ETEC-infected segments. In ETEC-infected segments PAP expression was increased. Perfusion with any of the β-glucans did not affect PAP expression in the intestinal mucosa. The results indicate that β-glucans do not promote net fluid absorption in piglets affected by post weaning diarrhea. The lack of effect of the β-glucans in the present study may be related to the amount and nature of β-glucans used, to the way they were extracted or to the duration of administration.

Key Words: β-Glucans, ETEC, post weaning digestive problems