Experimental infection with Escherichia coli 0149 : F4ac in weaned piglets

The outcome of experimental intestinal infections with enterotoxigenic Escherichia coli (ETEC) is dependent on several factors. An important factor is adhesion of the challenge strain to the intestinal mucosa. The test for susceptibility towards ETEC adhesion has so far been made by an intestinal adhesion test made after slaughter of piglets. However, in an experimental infection study with the purpose to obtain diarrhoeic piglets, it would be an advantage to test for susceptibility prior to experimentation. The Mucin 4 gene on porcine chromosome 13 has been proposed as a candidate gene for the production of the specific ETEC F4ab/ac receptor, and a DNA marker-based test has been developed to allow genotyping for ETEC F4ab/ac resistance/susceptibility [Jorgensen, C.B., Cirera, S., Archibald, A.L., Anderson, L., Fredholm, M., Edfors-Lilja, I., 2004. Porcine polymorphisms and methods for detecting them. International application published under the patent cooperation treaty (PCT). PCT/DK2003/000807 or WO2004/048606-A2]. The aim of this study was to test an experimental model for ETEC O149:F4ac-induced diarrhoea in piglets, selected for susceptibility towards ETEC O149:F4ac adhesion prior to experimentation using a DNA marker-based test. Sixty-two healthy 25-32 days old recently weaned Danish crossbred piglets were used. All piglets were tested prior to experimentation for susceptibility or resistance towards ETEC O149:F4ac adhesion. Thirty-nine piglets, both susceptible and resistant, were oro-gastric intubated with 10(9) CFU of ETEC O149:F4ac and 23 age-matched piglets, both susceptible and resistant, were used as non-infected controls. Of susceptible piglets, challenged with ETEC O149:F4ac, 74% had ETEC O149:F4ac-associated diarrhoea first day after first challenge, which were significantly higher relatively to the resistant and challenged piglets where 20% had diarrhoea (p = 0.04). This study suggests a model for experimental ETEC induced diarrhoea.

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Contributors: Jensen, G. M., Frydendahl, K., Svendsen, O., Jørgensen, C. B., Cirera, S., Fredholm, M., Nielsen, J., Møller, K.
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