LECTIN BINDING PROFILE ON THE SMALL INTESTINE OF 5-WEEK OLD PIGS IN RESPONSE TO USE OF ANTIBIOTICS AS GROWTH PROMOTANTS

Sajan George, Yejin Oh, Sebastien Vilain and Volker Brözel
Department of Biology and Microbiology

Stacy J. Lindblom and Artur J.M. Rosa
Department of Animal and Range Sciences

David Francis and Radhey S. Kaushik
Department of Veterinary Science

South Dakota State University
Brookings, SD 57007

ABSTRACT

Antibiotics are traditionally used for growth promotion in the pork industry; however, their use in animal feed has recently been banned in Europe because of the potential threat to human health. The intestinal microbiota together with the diet and gut epithelium comprises a complex ecosystem and plays an important role in mediating many physiological functions such as digestion/absorption which ultimately affects the growth performance and health of the animal. Lectins are carbohydrate binding proteins having specific affinities for accessible sugar residues on the cell membranes. The presence or absence of certain carbohydrates on the gut epithelium may influence the growth of host and susceptibility to different pathogens. The aim of this study was to identify the lectin binding profile on the small intestine of weanling pigs in response to feeding with chlortetracycline or germ free conditions. Eighteen half-sib piglets obtained by caesarian were divided into three groups (n=6) and maintained as antibiotic fed, control and gnotobiotic until 5-weeks of age. Glycoconjugate composition on the ileal surface was examined by histochemistry using 23 biotinylated lectins. Results obtained from three animals from each group were analyzed and data showed that the lectins DBA, RCA\textsubscript{120}, GSL-II, DSL, LEL, STL, WGA, s-WGA, Jacalin, PSA, LCA, SNA and MAL bound differentially to both villus and dome epithelium. Crypt epithelial cells showed varied affinity for STL while domes showed differences for WGA, PSA, LCA and MAL. Corona and follicles showed differential staining for GSL-I, STL, WGA, Jacalin, PSA, LCA and MAL. These findings will enable us to further understand the role of gut microbiota and mechanisms of action of antibiotics as growth promotants in pigs.