

## Algal polysaccharides to improve gut health in weaned pigs

García María.<sup>1</sup>, Rodríguez María.<sup>1</sup>, Rousseaux C.<sup>2</sup> and Nyvall-Collen P.<sup>1</sup>  
<sup>1</sup>Olmix SA and <sup>2</sup>Intestinal Biotech Development

### Background and objectives

Supporting intestinal mucosal integrity is determinant to ensure gut health in piglets specially during highly sensitive periods as weaning. Recent research has highlighted the potential of in-feed marine macroalgal polysaccharides to strengthen intestinal barrier function. The cell wall of marine algae is mainly composed of water soluble sulfated polysaccharides with several biological activities such as reinforcement of gut barrier function via induction of mucin secretion *in-vivo* in the intestinal mucosa (Barcelo et al., 2000).

### Materials and methods

The potential enhancement properties of a red algal extract from *Solieria chordalis* on intestinal integrity were assessed using in vitro cell models HT-29 MTX and Caco-2 cells for mucin and tight junction evaluation, respectively, under physiological and inflammatory conditions (Intestinal Biotech Development, 2017). The gene expression of several mucins (MUC1, MUC2, MUC4, MUC5AB and MUC5AC) and tight junction proteins (ZO-1, ZO-2, claudin-2) was evaluated by qRT-PCR.

### Results

The scientific findings showed that the red algal extract upregulates the gene expression of scaffolding and transmembrane proteins which are essential for optimal functioning of the tight junctions. Besides, the red algal extract upregulates the expression of mucin targeted genes that have crucial roles in the regulation of epithelial cell differentiation (membrane-bound), the establishment of the mucus layer (gel-forming) and the prevention of pathogen colonization. The use of the aforementioned red algae-based extract as part of an in-feed compound in post-weaning improved the health status of the piglets when compared to the control animals as shown by a decreased inflammatory status (-16% haptoglobin level at 26 days of age), better fecal consistency during the first two weeks post-weaning and a lower number of animals needing a medical treatment (-57%,  $P < 0.01$ ). Piglets better faced this stressful period and showed improved performance (+300g at 64 days, -1pt FCR).

### Conclusion and discussion

The tested red algal extract can reinforce gut health targeting barrier function which is the first line of mucosal defense. Thus it can be used as a natural alternative in-feed compounds to promote health and performance of pigs in the nursery phase and it can play an important role within the reduction of antibiotics in farms.

### References

A. Barcelo, J. Claustre, F. Moro, J-A. Chayvialle, J-C. Cuber and P. Plaisancié. Mucin secretion is modulated by luminal factors in the isolated vascularly perfused rat colon. Gut 2000;46:218–224218