



# EFFECTS OF A DIET INCLUDING PREBIOTICS AND PROBIOTICS ON INTESTINAL INFLAMMATION IN WEANING PIGLETS

Gina Cecilia PISTOL\*, Valeria Cristina BULGARU, Daniela Eliza MARIN, Ionelia TARANU  
 Laboratory of Animal Biology, National Institute for Research and Development for Animal  
 Biology and Nutrition – IBNA Balotesti, Calea Bucuresti no. 1, Balotesti, Ilfov, Romania

\*Corresponding author: gina.pistol@ibna.ro

**Abstract:** In the nutrition of piglets after weaning, an important aspect is to develop alternative feeding solutions to counteract the negative effects of weaning and to reduce mortality in piglets. In this paper we aimed to investigate the effects of a feed product containing a synbiotic combination of grape seed and camelina by-products and Lactobacilli strains in weaned piglets. Our results showed that synbiotic combination induced a reduction of the concentration of IL-1beta, IL-6, IL-8 and IFN-gamma pro-inflammatory cytokines, while the protein concentration of IL-10 anti-inflammatory cytokine was increased in intestine of piglets receiving synbiotic feed compared to those treated with LPS. In conclusion, diet inclusion of a synbiotic combination of grape seed and camelina meals plus probiotic can be used in the nutrition of post-weaning piglets, as modulator of intestinal inflammation and as positive modulator of general health status.

## • Introduction

There are many data from the literature showing the effectiveness of some by-products to improve gastro-intestinal health and enhance the immune response of farm animals. Dietary combination between different by-products with different characteristics and especially the combination between by-products as prebiotic and bacterial microorganisms as probiotics namely synbiotics (from synergism) have been less investigated. In this paper we aimed to investigate the effects of a feed product containing a synbiotic combination of grape seed and camelina by-products and Lactobacilli strains in weaned piglets.

## • Material and methods

24 cross-bred TOPIG hybrid piglets were randomly allocated into four experimental groups, as follows: Control group, LPS group challenged with lipopolysaccharides (LPS) and fed with control diet, SYN group receiving diet including 5% synbiotic and SYN+LPS group fed 5% SYN diet and challenged with LPS.

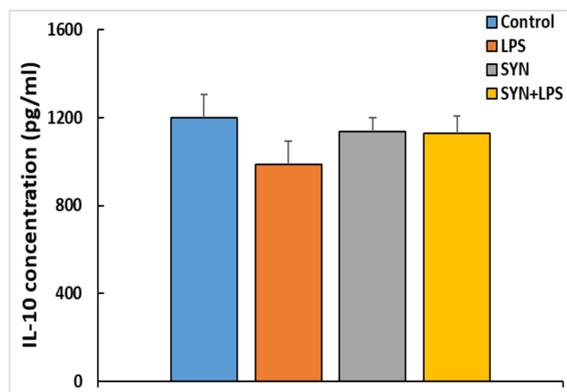
SYN = combination of grape seed and camelina meals (3:1) plus Lactobacilli probiotic

The pro-inflammatory cytokines in jejunum samples were evaluated by ELISA.

## • Results and discussions

Experimental group	Cytokine concentration (pg/ml)			
	IL-1 beta	IL-6	IL-8	INF-gamma
Control	219.9±17.5 <sup>b</sup>	3700.0±271.6 <sup>a</sup>	4514.5±327.3 <sup>a</sup>	1706.8±157.1 <sup>a</sup>
LPS	471.5 ± 83.2 <sup>a</sup>	4647.4 ± 730.9 <sup>a</sup>	4841.0 ± 299.8 <sup>a</sup>	2877.9 ± 442.3 <sup>a</sup>
SYN	219.5±36.5 <sup>b</sup>	2768.2±146.5 <sup>a</sup>	4582.6±331.3 <sup>a</sup>	2075.8±149.7 <sup>a</sup>
SYN+LPS	278.3±48.0 <sup>a</sup>	3083.6±232.9 <sup>a</sup>	4435.3±262.7 <sup>a</sup>	2336.0±282.4 <sup>a</sup>

- ✓ an increase of pro-inflammatory cytokines IL-1beta, IL-6, IL-8 and IFN-gamma concentration was detected in the jejunum of LPS-treated piglets
- ✓ SYN induced a reduction of the concentration of IL-1beta, IL-6, IL-8 and IFN-gamma in jejunum of piglets from SYN+LPS group compared to those challenged with LPS.



- ✓ a reduction of IL-10 anti-inflammatory cytokine concentration was registered in the jejunum of LPS-treated piglets;
- ✓ the protein concentration of IL-10 cytokine was increased in jejunum of piglets receiving synbiotic feed compared to those treated with LPS.

## • Conclusion

Diet inclusion of a synbiotic combination of grape seed and camelina meals plus Lactobacilli probiotic can be used in the nutrition of post-weaning piglets, as modulator of intestinal inflammation.

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