*Proceedings of the Nutrition Society* (2010), **69 (OCE3)**, E235 doi:10.1017/S0029665110000248

*3rd Immunonutrition Workshop, 21–24 October 2009, Girona, Spain*

# Dietary plasma protein supplementation ameliorates lung inflammation induced by LPS administration in mice

M. Maijó[1], A. Pérez-Bosque[1,2], L. Miró[1], J. Polo[2], L. Russell[3], J. Campbell[3], E. Weaver[3], J. Crenshaw[3] and M. Moretó[1]

[1]*Department of Physiology, Research Institute for Nutrition and Food Safety, Faculty of Pharmacy, University of Barcelona, Spain,* [2]*APC Europe, Granollers, Spain and* [3]*APC Inc., Ankeny, IA, USA*

Spray-dried porcine plasma (SDP) is a feed ingredient composed of diverse functional proteins and biologically essential compounds. In previous studies[1,2], we have shown that dietary supplementation with SDP attenuates the intestinal inflammation induced by the enterotoxin B of *Staphylococcus aureus* (SEB). Since the common immune system interconnects inductive with effector sites, we studied the effects of dietary plasma proteins in a mice model of pulmonary inflammation. Male C57BL/6 Hsd Mice were fed diets supplemented with 8% SDP (SDP group), 2% IC (IC group) or milk proteins (Control group) from day 19 (weaning) until day 33. On days 32 or 33, mice were given an intranasal dose of lipopolysaccharide (LPS) from *Escherichia coli* (500 μg/kg BW; groups LPS, LPS-SDP and LPS-IC), or PBS (1 ml/kg; groups Control, SDP and IC). Cytokine concentrations were analysed in broncoalveolar lavage fluid (BALF) 6 h after the LPS challenge and the phenotype of polymorphonuclear (PMN) cells were measured 24 h after LPS administration. Challenge with LPS increased BALF concentrations of IL-1α, IL-1β, IL-6 and TNF-α by 45-, 143-, 1460- and 1526-fold, respectively ($P<0.001$). Both plasma protein supplements partially prevented the effects of LPS on the concentration of IL-1α, IL-1β and IL-6 by 30–50% ($P<0.01$) and on TNF-α by 75% ($P<0.001$). Intranasal LPS increased 27-fold the number of leucocytes and changed the profile of the cells present in BALF (Control group, 3% were lymphocytes and 97% PMN; LPS group, 40% and 60%, respectively; $P<0.001$). Although both SDP and IC reduced LPS-induced leucocyte recruitment into BALF, the supplements did not modify the effects of the endotoxin on cell profile. These results indicate that dietary plasma protein supplementation can reduce the activation of the immune nasal-associated lymphoid tissue in response to an LPS challenge.

This work was supported by grant RDITCRD07-1-008 (Generalitat de Catalunya, Spain)

1. Pérez-Bosque A, Pelegrí C, Vicario M *et al*. (2004). *J Nutr* **134**, 2667–2672.
2. Pérez-Bosque A, Miró L, Polo J *et al*. (2008). *J Nutr* **138**, 533–537.