**P17**

Does the food substrate influence the functionality of probiotics?

RDCS Ranadheera, J Luo, P-H Ho, MC Adams

_School of Environmental and Life Sciences, University of Newcastle, NSW 2308, Australia_

**Background** – Food substrate (diet) is considered as one of the major factors in regulating colonization of microorganisms in the gastrointestinal tract, and therefore may play a major role in the successful application of probiotics into human and animal diets. Indeed, food helps to buffer the bacteria through the stomach and contains other functional ingredients, such as bioactive compounds, that may interact with the probiotics to alter their functionality. This interaction may be species specific. Although probiotics originally were intrinsically linked to food, there is now an increasing trend in using probiotics as nutraceuticals, such as in capsules. This changing trend in probiotic delivery may lead to a reduced functional efficacy due to the exclusion of the potential synergistic effect of the food.

**Objective** – To evaluate the influence of food substrate on functionality of probiotics, with special reference to their ability to influence _in vitro_ cytokine production.

**Design** – Three newly identified probiotic strains _Propionibacterium jensenii_ 702, _Lactobacillus gasseri_ HA 4, _L. acidophilus_ HA 12 and commercially available _Bifidobacterium lactis_ Bb 12 were grown in different samples of pasteurised goat milk, bovine milk and standard mediums. After sonication cell free fractions were collected and polymorphonuclear cells were stimulated. Cytokines produced (IFNγ, IL-2, IL-4 and IL-10) were measured by ELISA.

**Outcomes** – _P. jensenii_ 702, _L. gasseri_ HA 4 and _Lacidophilus_ HA 12 demonstrated satisfactory growth in both bovine and caprine milk compared to standard mediums (maximum bacterial count range from 5x10^7-1.4x10^8 cfu/ml). However, their growth patterns were different. Considerable number of substrate samples demonstrated different levels of cytokine production responding to different bacterial strains. Selection of probiotic strains for novel functional foods promoting immune modulation are selected based upon food probiotic interactions.

**Conclusions** – It is apparent that substrate may influence _in vitro_ cytokine production, and therefore selection of probiotic strains for functional foods should be made only after careful investigation of potential interactions between the probiotic and food substrate. It is acknowledged that further _in vivo_ research will be necessary to determine the true extent of the influence food substrates have on individual probiotic strain clinical efficacy.

**P18**

Fatty acid composition of edible oils derived from certified organic and conventional agricultural methods

MJ Foster¹, JFY Chow¹, ZI Ahmad¹, JL Phuyal¹, P Petocz², S Samman¹

¹ Human Nutrition Unit, School of Molecular and Microbial Biosciences, University of Sydney, NSW 2006
² Department of Statistics, Division of Economic and Financial Studies, Macquarie University, NSW 2109

**Background** – One of the primary reasons for the purchase of organic food is the perception that it conveys nutritional advantages over conventional products. Despite a growing scientific interest in the nutrient composition of organic products, only a limited number of studies have investigated the fatty acid composition of edible oils.

**Objective** – To analyse and compare the fatty acid composition of commercially available edible oils derived from certified organic and conventional agricultural methods.

**Design** – A total of 59 certified organic and 53 conventional oils were purchased from local Sydney retail markets and matched for comparison. Fatty acid composition was determined by gas chromatography. The organic and conventional samples were compared with respect to Saturated, Monounsaturated, and Polysaturated classes of fatty acids (SFA, MUFA, and PUFA, respectively) using an analysis of variance model with type of oil and method of production (organic or conventional) as fixed factors, and sample pair as a random factor. Further analyses were conducted for each oil type separately, including non-parametric testing of categories with a small number of pairs.

**Outcomes** – No consistent overall trend of difference in fatty acid composition was observed between organic and conventional oils. SFA, MUFA, and PUFA were all significantly different between types of oil (P<0.001 in all three), and each had significant interaction between type and production method (P<0.002, P<0.001, and P<0.001, respectively) indicating that organic and conventional oils differed in these components in an inconsistent fashion. Despite this, some specific pairs of oils showed large differences between MUFA and PUFA components.

**Conclusion** – The absence of an overall difference in the fatty acid composition of organic and conventional oils does not support the tenet that organic foods are of a higher nutritional quality than their conventional counterparts. At least with respect to oils, consumers need to consider other reasons for purchasing organic products, such as the support of food production systems that minimise environmental damage (1).

**Reference**