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A study on the survival of probiotic Lactobacilli in tomato and orange juice

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Background – Probiotic bacteria are increasingly being incorporated into food products in order to develop “functional foods”. Most of the probiotic products in the market are in the form of fermented milk and yoghurt. Vegetable and fruit juices could, however, be ideal delivery vehicles for probiotics due to their shorter gastrointestinal transit time, reducing exposure of the incorporated probiotics to the unfavourable conditions of stomach. In addition, they are accepted by all age groups. Moreover, they are good sources of advantageous nutrients e.g. vitamins, minerals, dietary fibres and antioxidants. Therefore, incorporation of probiotics into vegetable and fruit juices may enhance the range and level of health promoting effects by these products.

Objective – This study aimed to evaluate the suitability of tomato and orange juice as alternative carriers for probiotic strains.

Design – Three probiotic Lactobacilli (*Lactobacillus rhamnosus* GG, *Lactobacillus gasseri* HA4 and *Lactobacillus fermentum* HA6) in two inoculum concentrations were added to commercial tomato and orange juice and stored at 4 °C, 23 °C and 37 °C for 4 weeks. Viable cell counts, pH and acidity of the products were measured during storage time.

Outcomes – At 4 °C, *Lactobacillus rhamnosus* GG and *Lactobacillus gasseri* HA4 were highly stable in both juices and remained at almost consistent levels throughout the storage time. At higher temperatures (23 °C and 37 °C), however, rapid fermentation did occur and this is likely to be a difficulty in ensuring the shelf life of these products.

Conclusion – Tomato and orange juices can be considered as suitable delivery vehicles for probiotics. However, in order to prolong the shelf life of the products and to assure that the minimum effective dose is delivered to consumers, they should be kept refrigerated

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Modulation of theanine and caffeine in green tea

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Background – Green tea is a widely consumed beverage consisting of a hot water infusion of budding leaves and shooting stems of the plant *Camellia sinensis*. Recently, some studies have focused upon its mood-affecting components, theanine and caffeine. Theanine has been linked to both an increased alertness and a calming effect. This contrasts with caffeine which increases edginess as well as alertness.

Objective – To measure theanine and caffeine in the leaves and stems of green tea plants through a growing season, with or without shading, in order to determine whether their ratio is affected.

Design – Eight green tea plants, four grown under full sunlight and four under 90% shade, were sampled over 11 weeks during the spring of 2007. The theanine and caffeine were measured in the leaves and the stems of each collected sample using HPLC analysis.

Outcomes – The leaves were found to have a significantly lower ratio of theanine to caffeine (-48%, $P < 0.02$) than the stems, especially when the leaves of plants grown in full sunlight were compared to stems of plants grown under 90% shade (-73%, $P < 0.03$).

Conclusion – Different blends of leaves and stems from plants grown with or without shade could therefore be utilised to produce different functional green tea products with different required ratios of theanine and caffeine for the different desired mood effects.