NATURAL AND ADDED ANTIOXIDANTS OF YOGURT

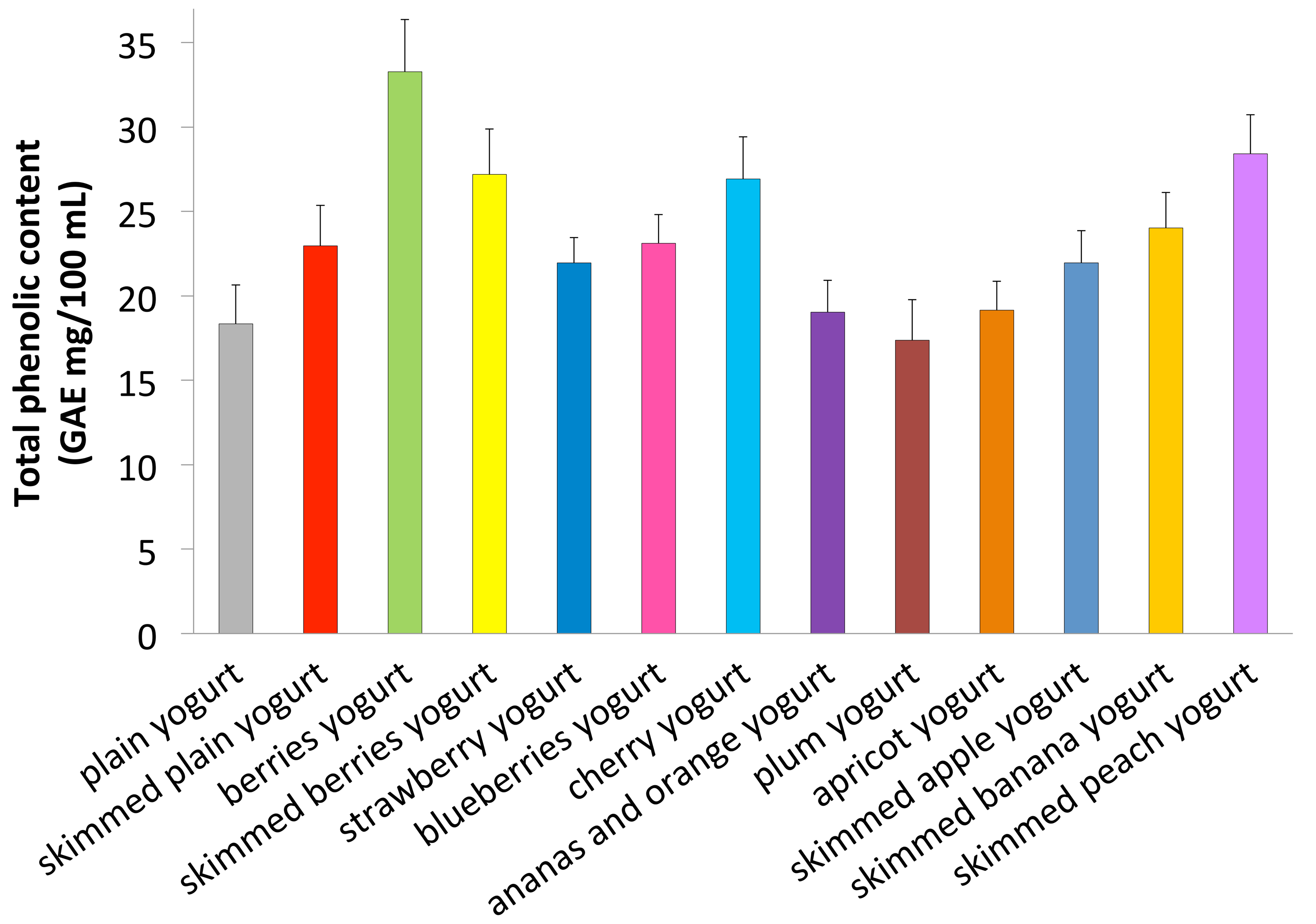
Anna Citta[a], Alessandra Folda[a], Guido Scutari[a], Valeria Scalcon[b], Alberto Bindoli[b], Emiliano Feller[c] and Maria Pia Rigobello[a]

[a] Department of Biomedical Sciences, University of Padova, via U. Bassi 58/b, 35131 Padova, Italy
[b] Institute of Neuroscience (CNR), viale G. Colombo 3, 35131, Padova, Italy
[c] Centrale del Latte di Vicenza via A. Faedo, 60 , 36100, Vicenza, Italy

Introduction

Milk and dairy products, which are relevant foods in human nutrition, can be beneficial to consumers also as defense against oxidative stress. Oxidation processes in milk can result in strong off-flavours and in deterioration of the nutritional quality of milk; therefore, the oxidative stability of yogurt has noteworthy importance. The antioxidant activity is due to the natural antioxidants present in milk, coming also from the food supply of herbivores, then present in yogurt. The non-enzymatic antioxidants of yogurt are ascorbic acid, tocopherols, polyphenols such as flavonoids and carotenoids. In addition, milk itself, yogurt, and in general fermented milk, contain bioactive peptides, which are released by hydrolysis of milk proteins during the fermentation process and can be endowed with antioxidant activity (1).

Total phenolic contents (TPC) in different types of yogurt

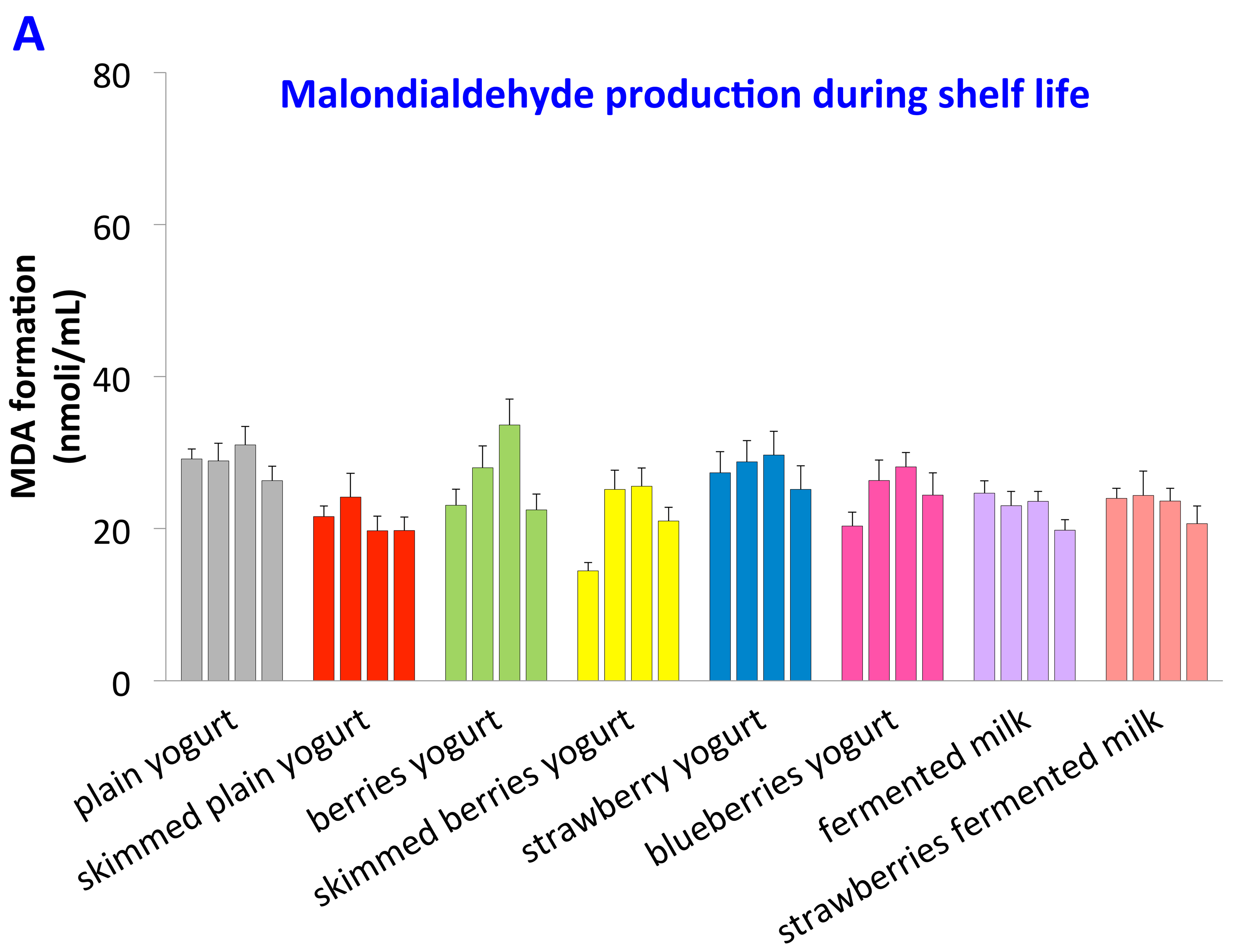


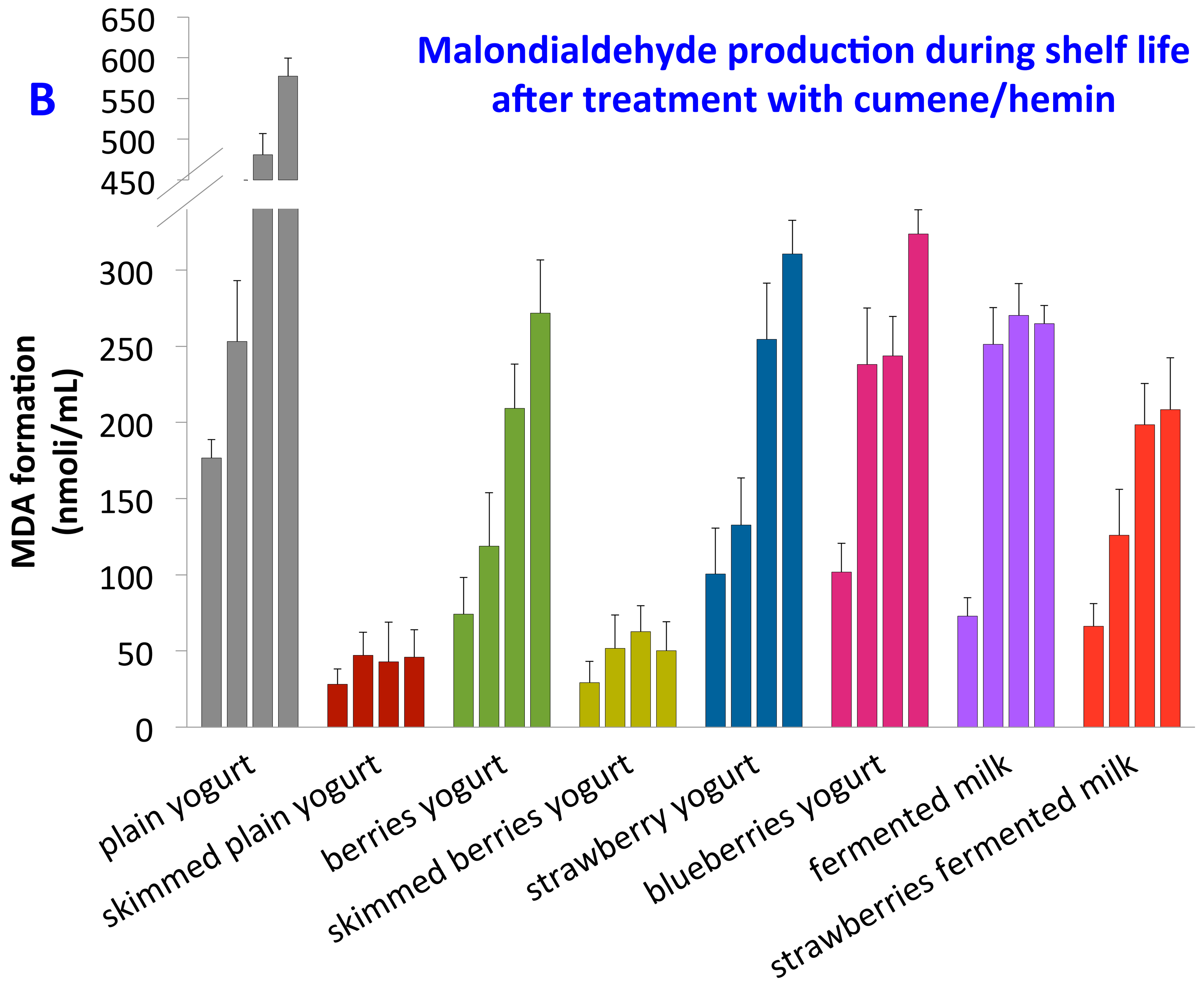
Water yogurt extracts (1mL) were tested and TPC were determined by Folin-Ciocalteau method. The results were expressed as mg of gallic acid equivalents (GAE) per 100 mL of yogurt

Antioxidant capacity in different types of yogurt with ABTS

Type of yogurt	Trolox equivalent antioxidant capacity (µM Trolox/mL of yogurt) Weeks			
	I	III	IV	VI
plain yogurt	826.6	712.8	405.2	931.7
skimmed plain yogurt	1033.6	938.3	436.8	902.9
berries yogurt	1835.3	1358.3	1442.4	1739.4
skimmed berries yogurt	1905.9	1566.2	1552.3	1792.9

Aliquots of yogurt extracts were treated with 0.04 mM ABTS, previously prepared, and the decrease of absorbance was detected at 415 nm with a plate reader. The values obtained were compared with a standard curve of Trolox C and expressed as Trolox equivalent antioxidant activity (TEAC) (µM Trolox C/mL of yogurt).





Lipid peroxidation was evaluated during yogurt samples storage (weeks). In panel **A**, aliquots of 0.1 mL of yogurt were subjected to MDA determination. In panel **B**, aliquots of 0.1 mL of yogurt were treated for 30 min with 22 mM cumene/0.04 mM hemin, then subjected to MDA determination. In both cases, fluorometric analysis was performed, after extraction of malondialdehyde with butanol, exciting at 530 nm and measuring fluorescence at 540 nm. For the quantification of malondialdehyde a standard curve with MDA was performed.

Results and conclusions

The different content of total phenols is dependent on the fruit puree added (2), while the antioxidant power measured with the ABTS (2,2'-azino-bis-3-ethylbenzthiazoline-6-sulphonic acid) test, revealed an antioxidant activity also of white yogurt, which increases in the presence of fruit puree. Lipid peroxidation was measured both in basal conditions as in the presence of cumene/hemin and we observed that the addition of berries puree is relevant to reduce lipid oxidative stress.

Reference

1. Aloglu H.S., Oner Z. Determination of antioxidant activity of bioactive peptide fractions obtained from yogurt. Journal of Dairy Science, 2011, 94, 5305-5314.
2. Sengul M., Erkaya T. and Yildiz H. The effect of adding sour cherry pulp into yoghurt on the physicochemical properties, phenolic content and antioxidant activity during storage. International Journal of Dairy Techonology, 2012, 65, 429-436.

Acknowledgments
Dr. Feller E. and Centrale del Latte di Vicenza for the supply of yogurt

XIV CONGRESSO DELLA SOCIETÀ ITALIANA DI FITOCHIMICA
10-12 giugno 2015
Valorizzazione della biodiversità italiana: le proprietà salutistiche delle piante alimentari.

Per noi la qualità è centrale.