

# Total Antioxidant Capacity in selected Day neutral and June bearing Strawberries

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**INTRODUCTION:** Strawberries are a good source of phytochemical components including anthocyanins, flavonols, and antioxidant molecules. Several projects were started in 1995 by Agriculture and Agri-Food Canada to develop firm strawberry cultivars with a long shelf life suitable for transportation and resistant to post harvest diseases. Chemical analysis of the selected fruits revealed a positive correlation between the level of some antioxidants, e.g. proanthocyanidins, shelf life and disease susceptibility (Khanizadeh et al., 2002).

**MATERIALS & METHODS:** Fresh fruits (0.5 kg) from 8 June-bearing and 7 day-neutral (Table 1) strawberry genotypes were collected from a completely randomized design with three replications at optimum ripeness stage. Samples (25 g) were then frozen in liquid nitrogen, grounded by mortar and pestle and were homogenized with 50 ml cold distilled water. Total antioxidant activity was estimated using ABTS and Trolox assay (Gao et al., 2000).



**RESULTS:** The data presented here suggest that June-bearing strawberries possess an advanced antioxidant system, which on average produce more hydrophilic and lipophilic antioxidants than day-neutrals. The present study also indicates a significant variation in antioxidant capacity in June-bearing genotypes and the possibility of production of new strawberry cultivars with greater antioxidant capacity through the traditional breeding program.

Table 1. Trolox equivalent antioxidant capacity of selected June-bearing and day-neutral strawberry genotypes.

Genotype	Crude	Hydrophilic		Lipophilic	
		Raw	% <sup>a</sup>	Raw	% <sup>a</sup>
<b>June-bearing</b>					
Jewel	19.490±1.22bc	13.252±1.79e	68.0	0.391±0.06bc	2.0
Kent	21.450±0.44b	10.996±0.30de	51.3	0.335±0.01c	1.5
FIO9623-102	21.290±0.13b	12.028±0.86cd	56.5	0.392±0.02bc	1.8
FIO968-1	18.193±0.47cd	10.810±0.71de	59.4	0.482±0.04ab	2.6
LL9324-24	19.410±0.66bc	14.377±0.27bc	74.1	0.513±0.02ab	2.6
FIO9623-43	16.691±0.91d	12.205±0.91cd	73.1	0.537±0.06a	3.2
FIO9624-11	25.087±1.04a	17.608±0.23a	70.2	0.569±0.04a	2.2
Orléans	21.452±1.30b	16.282±0.54ab	75.9	0.575±0.02a	2.6
Mean	20.382	13.444	66.9	0.474	2.3
Cultivar	***	***		**	
<b>Day-neutral</b>					
FIN008-124	13.124±0.41	9.408 ±0.54	71.7	0.278±0.02	2.1
FIN005-55	12.139±0.66	10.164±0.64	83.7	0.291±0.02	2.4
FIN005-7	13.749±0.64	8.815±0.48	64.1	0.251±0.02	1.8
FIN005-50	12.407±0.51	9.062 ±0.48	73.0	0.296±0.02	2.4
FIN0016-115	14.360±0.50	10.558±0.53	73.5	0.340±0.03	2.4
FIN0132-11	13.455±0.85	8.847±0.63	65.7	0.251±0.02	1.8
Seascape	12.936±0.71	8.855±0.81	68.4	0.263±0.02	2.0
Mean	13.167	9.387	71.3	0.281	2.1
Cultivar	N.S.	N.S.		N.S.	
<b>Contrast June-bearing vs Day-Neutral</b>					
F Value <sup>b</sup>	11.38**	2.90*		0.04 <sup>NS</sup>	

<sup>a</sup> The average percentage of H-TEAC and L-TEAC to crude antioxidants.

<sup>b</sup> Orthogonal Contrast using single degree of freedom to compare the two group;

\*\*, \* and NS: significant at 0.01, 0.1 and not significant respectively

**References**

Gao, X., M. Ohlander, N. Jeppsson, L. Björk & V. Trajkovski, 2000. Changes in antioxidant effects and their relationship to phytonutrients in fruits of sea buckthorn (*Hippophae rhamnoides* L.) during maturation. *Journal of Agricultural & Food Chemistry* 48: 1485-1490.  
 Khanizadeh, S., J. Cousineau, L. Gauthier, D. Buszard & C. Hébert, 2002. "L'authentique Orléans": A new strawberry cultivar with high levels of antioxidants. *Acta Hort* 567: 175-176.

