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# Effect of processing on organic and conventional fruits and vegetables phytochemicals

*BY*

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## ***ABSTRACT***

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## **ABSTRACT**

A preliminary study was carried out to evaluate the phytochemical and bioactive compounds of selected five plants namely, green bean (*Phaseolus vulgaris* L.), strawberry (*Fragaria x ananassa* Duch.), mango (*Mangifera indica* L.), peppermint (*Mentha x piperita* L.) and fenugreek seeds (*Trigonella foenum-graecum* L.) which produced either conventionally or organically. As well as, studying the effect of some different technological processes on phytochemical and bioactive compounds contents of their products and the results revealed that, organic green beans had higher contents of total phenolic, flavonoid compounds and antioxidant activity than those of conventional ones. Both steaming and boiling blanching methods had significantly affected the reduction of the most chemical constituents content for organic and conventional green beans. Blanched organic and conventional green beans by steaming process had a higher content of total phenolic and flavonoid compounds comparing with those of the boiling process. As well as, the organic green beans had highly increasing rate comparing with those of conventional ones.

Organic strawberries had higher contents of total phenolic, flavonoid compounds and antioxidant activity comparing with those of conventional ones. No significance changes in all chemical constituents of organic and conventional strawberry fruits after 2 months of storage, as well as up to 6 months of frozen storage period at – 18 °C. Jam making process (thermal treatment) of both organic and conventional strawberry fruits led to significant changes for all tested chemical constituents. Organic strawberries had slightly higher contents of total phenolic and flavonoid compounds than those of conventional ones but during jam making process caused highly decreases.

The pasteurization process for mango nectar samples caused positive effects for organic and conventional fruits of all tested parameters and bioactive compounds contents, as well as antioxidant activity comparing with those of ozone plus pasteurization process. Oven drying method was more positive effect and had highly increased of total phenolic, flavonoid compounds fractions and antioxidant activity for both dried organic and conventional peppermint leaves comparing with those of shade drying method. Germination process caused a significant increase in all bioactive compounds including total phenols and flavonoids contents, as well as, antioxidant activity of both organic and conventional fenugreek seeds. Germinated organic and conventional fenugreek seeds treated with ozone recorded the lowest microbial growth during storage period comparing with those of untreated germinated organic and conventional fenugreek seeds.

**Keywords:** Bioactive compounds- Organic products- Germination process- antioxidant activity- thermal treatments- Ozone

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## LIST OF ABBREVIATIONS

<b>AAE</b>	Ascorbic acid Equivalent
<b>ABTS</b>	(2, 2'-azino-bis (3-ethylbenzthiazoline- 6-sulfonic acid))
<b>ARC</b>	Agriculture Research Center
<b>CAGR</b>	Compound Annual Growth Rate
<b>CAPMAS</b>	Central Agency for Public Mobilization and Statistics
<b>CFU</b>	Colony Forming Unit
<b>DNA</b>	Deoxyribonucleic acid
<b>DPPH</b>	2, 2'-Diphenyl-1-picrylhydrazyl
<b>EC<sub>50</sub></b>	Half maximal effective concentration
<b>ECE</b>	Epicatechin Equivalent
<b>EU</b>	European Union
<b>FDA</b>	Food and Drug Administration
<b>FRAP</b>	Ferric reducing-antioxidant power
<b>GAE</b>	Gallic Acid Equivalents
<b>GE</b>	Glucoside Equivalent
<b>HPLC</b>	High performance liquid chromatography
<b>IFOAM</b>	International Federation of Organic Agriculture Movements
<b>pH</b>	Potential hydrogen
<b>QE</b>	Quercetin Equivalent
<b>RE</b>	Rutin Equivalent
<b>TS</b>	Total solids
<b>TSS</b>	Total Soluble Solids