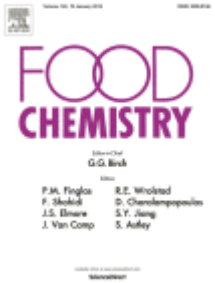
Food Chemistry
Volume 143, 15 January 2014, Pages 522–529



A comparison of the nutritional value and food safety of organically and conventionally produced wheat flours

Ivana Vinković Vrček[a], Dubravka Vitali Čepo[b], Dubravka Rašić[a], Maja Peraica[a], Irena Žuntar[b], Mirza Bojić[b], Gordana Mendaš[a], Marica Medić-Šarić[b]

Highlights

•This study evaluated nutritional status of organic and conventional wheat flours.
•Multielement profile, protein content and digestibility, and mycotoxin levels were examined.
•The study revealed negative effect of organic cultivation on protein content in wheat flours.
•Improvements in content of some microelements in organic flours were observed.
•The reduced contamination with toxic metals and mycotoxins was found in organic samples.

Abstract

Growing interest in organic agriculture has prompted this study aiming to evaluate nutritional content of wheat flours originating from organic and conventional production systems. Obtained results showed that organic samples had significantly lower protein content and lower levels of Ca, Mn and Fe compared to conventional samples. Protein digestibility and levels of K, Zn and Mo were significantly higher in organic than in conventional wheat flours. Regarding undesirable metals, significantly higher levels of As and Cd were found in conventional compared to organic wheat flours. Although the mean concentrations of zearalenone and ochratoxin A were higher in conventional than in organic flours, this difference was not significant. This study revealed that organic agriculture has the potential to yield products with some relevant improvements in terms of high quality proteins and microelements contents, while the reduction in contamination with toxic elements and mycotoxins may be accomplished.

Keywords
Wheat flour; Organic; Conventional; Proteins; Minerals; Toxic metals; ICP-MS; Mycotoxins; Zearalenone; Ochratoxin A; HPLC

Corresponding author. Tel.: +385 14682540; fax: +385 14673303.