STEFAN CEL MARE UNIVERSITY OF SUCEAVA

Journal Food and Environment Safety of the Suceava University

FOOD ENGINEERING

Volume XVII, Issue 4 31 DECEMBER 2018

Available online http://www.fia.usv.ro/fiajournal

©

Publised by University Publishing House of Suceava

AIMS AND SCOPE

The scientific journal *Food and Environment Safety* is a quarterly publication (4 issues per year) of the Faculty of Food Engineering, Stefan cel Mare University of Suceava, Romania, that is indexed in the International Databases: Index Copernicus Journals Master List, Ulrich's and Chemical Abstract (CAS). Also, it is acknowledged B+ by the main Romanian funding organization for university and postgraduate research programmes - National University Research Council (CNCSIS).

The purpose of *Food and Environment Safety* journal is to provide a means of rapid publication for significant contributions to the improvement and diversification of specific activities in the field of food engineering, food and environment safety, biotechnologies, chemical engineering, biosensors, agriculture and applied sciences as well. Moreover, the journal assures promotion of research results in the field of food production and, from the nutritional and toxicological point of view, it underlines the importance of applying the best analyzing and control methods for consumer's protection, food technologies, industrial biotechnologies and environment protection as well to increase life quality.

Food Engineering Faculty journal has been published since 2000 like *Analele Universitatii Stefan cel Mare Suceava*, *Sectiunea Colegiul Tehnic (ISSN 1583-2295)*. Between 2002 and 2004 the journal was published biannually like *Analele Universitatii Stefan cel Mare Suceava*, *Sectiunea Inginerie Alimentara* (ISSN 1583-2295), then from 2005 till 2009, it was issued biannually like *ANNALS of Suceava University - Food Engineering* (ISSN 1842-4597), indexed in Index Copernicus data base and acknowledged by the National University Research Council (CNCSIS), Romania. In 2010, the Food Engineering Faculty journal changed its name in *Food and Environment Safety* (ISSN 2068 - 6609).

The cover of the journal was made by Niculai Moroşan.

Available online: http://www.fia.usv.ro/fiajournal
Address for submission, e-mail fiajournal@fia.usv.ro

CIP description of National Library

The scientific journal *Food and Environment Safety* (ISSN 2068 – 6609) is published by University Publishing House of Suceava, Romania.

Mail address of the University Publishing House of Suceava: Stefan cel Mare University, Suceava, Universitatii str. No. 13, 720229, Suceava, Romania

www.usv.ro, http://www.usv.ro/index.php/ro/1/Editura%20USV/238/3/15

Tel: +40 230 216 147, **Fax:** +40 0230 520 080

Editorial contact information:

Faculty of Food Engineering, Stefan cel Mare University, Suceava, Universitatii str., No. 13, 720229, Suceava, Romania,

Phone/Fax: +40 230 520267, www.fia.usv.ro

Editor-in-Chief:

Prof. Ph.D,Eng. Sonia AMARIEI (GUTT), gutts@fia.usv.ro

Subscription information

Subscription information can be obtained from:

- the e-mails: fiajournal@fia.usv.ro
- the postal address:

Faculty of Food Engineering, Stefan cel Mare University - Suceava, Universitatii str., No. 13, 720229, Suceava, Romania

EDITOR-IN-CHIEF:

Sonia AMARIEI (GUTT) Ştefan cel Mare University of Suceava, Romania

EDITORIAL BOARD

Petru ALEXE Dunărea de Jos University of Galați, Romania

Thiery ABRAHAM Enzymes & Derivates, Bruxelles, Belgium

Marcel AVRĂMIUC Ştefan cel Mare University of Suceava, Romania

Şerif BALDIRAN Amasya University, Amasya, Turkey

Elena-Gabriela BAHRIM Dunărea de Jos University of Galați, Romania

Lidija BASA University of Ljubljana, Slovenia

Zoita Mărioara BERINDE

Technical University of Cluj Napoca - North University

Carter of Pais Mars Parassis

Center of Baia Mare, Romania

Iulian BOBE Tyton BioSciences, Darien, USA

Marija BODROŽA-SOLAROV University Novi Sad, Institute for Food Technology, Serbia

Ioan CHEREJI University of Oradea, Romania

Cristina-Gabriela CONSTANTINESCU Stefan cel Mare University of Suceava, Romania

Călina Petruța CORNEA

University of Agronomic Sciences and Veterinary Medicine

in Bucharest, Romania

Toshiki ENOMOTO Ishikawa Prefectural University, Nonoichi, Japan

Dirk FLOTTMAN Technical University of Aalen, Germany

José Antonio GABALDÓN HERNÁNDEZ Catholic University of Murcia (UCAM), Spain

Robert GRAVANI Cornell University, Department of Food Science, USA

Georg GUTT Stefan cel Mare University of Suceava, Romania

Nicoleta Gabriela HĂDĂRUGĂ

Banat University of Agricultural Sciences and Veterinary

Medicine Timisoara, Romania

Cristina-Elena HREŢCANU Ştefan cel Mare University of Suceava, Romania

Elena JOSHEVSKA University St. Kliment Ohridski, Bitola, Macedonia

Süleyman KALELI Sakarya University, Sakarya, Turkey

Institute of Ecology of Nature Research Center, Vilnius, Nijole KAZLAUSKIENE

Lithuania

Ana LEAHU Ștefan cel Mare University of Suceava, Romania

Anna MARAZ Corvinus Unversity of Budapest, Hungary

Centro Tecnológico Nacional de la Conserva y Alimentación, Angel MARTINEZ SANMARTIN

Murcia, Spain

Carmen MORARU Cornell University, Department of Food Science, USA

Ileana Denisa NISTOR Vasile Alecsandri University of Bacău, Romania

Mircea-Adrian OROIAN Ștefan cel Mare University of Suceava, Romania

Banat University of Agricultural Sciences and Veterinary Mariana-Atena POIANĂ

Medicine Timisoara, Romania

Regina PROSKUVIENE Vilnius Pedagogical University, Lithuania

Peter RASPOR University of Ljubljana, Slovenia

Gabriela RÂPEANU Dunărea de Jos University of Galați, Romania

Banat University of Agricultural Sciences and Veterinary Adrian RIVIŞ

Medicine Timisoara, Romania

Alice ROŞU Ștefan cel Mare University of Suceava, Romania

Sorin SABAU Tokai University, Sapporo, Japan

Sapientia — Hungarian University of Transylvania, Alexandru SZÉP

Miercurea Ciuc, Romania

University of Agricultural Sciences and Veterinary Medicine Carmen SOCACIU

Cluj-Napoca, Romania

Rodica STURZA Technical University of Moldova, Chisinau, Moldova

Gagik TOROSYAN State Engineering University of Yerevan, Armenia

Never TOROSYAN CSRO Institute, Yerevan, Armenia

European Regional Educational Academy, Yerevan, Armenia Yeva TOROSYAN

Felicia TUTULESCU DRAGOMIR University of Craiova, Romania

Bukovina Medical State University, Ukraine Igor WINKLER

Gheorghe ZGHEREA Dunărea de Jos University of Galați, Romania