

ISSN 1644-0730

ACTA SCIENTIARUM POLONORUM

Scientific journal (quarterly), issued since 2002,
whose founder and advocate is the Conference of the Rectors of Universities
of Life Sciences

Technologia Alimentaria

Food Science and Human Nutrition

16(2) 2017

April – June



Bydgoszcz Kraków Lublin Olsztyn
Poznań Siedlce Szczecin Warszawa Wrocław

ACTA Scientiarum Polonorum Technologia Alimentaria was founded by all Polish Agricultural Universities in 2001 and it is published by Poznań University of Life Sciences Press.

Honorary Advisory Board of Acta Scientiarum Polonorum

Józef Bieniek (University of Agriculture in Krakow), Barbara Gąsiorowska (Siedlce University of Natural Sciences and Humanities), Wojciech Gilewski (Warsaw University of Life Sciences – SGGW), Janusz Prusiński (UTP University of Science and Technology in Bydgoszcz), Julita Reguła (Poznań University of Life Sciences), Wiesław Skrzypczak (West Pomeranian University of Technology, Szczecin), Krzysztof Szkucik (University of Life Sciences in Lublin), Jerzy Sobota (Wrocław University of Environmental and Life Sciences), Ryszard Żróbek (University of Warmia and Mazury in Olsztyn)

Affiliation

Faculty of Food Science and Nutrition

Poznań University of Life Sciences, Poland



This journal is the open access and non-profit enterprise. The published papers may be collected, read and downloaded free of charge – with Author's rights reserved. We have adopted a Creative Commons licence CC BY-NC (Attribution-NonCommercial).

Aim and scope

The original scientific peer-reviewed papers published in ACTA Scientiarum Polonorum Technologia Alimentaria journal cover main aspects of food science from raw materials properties through processing aspects up to quality of final products and their nutritional properties, usability and dietetics.

It involves fundamental and applied research, including selected subjects of food science and human nutrition with pointing out at their interface.

All of these problems can be put into following topics:

Food Technology

- influence of all processing parameters on food quality and safety
- systems and methods of controlling and modification of food properties
- food biotechnology and microbiology
- any subject at the interface between food processing and food quality and human nutrition (paper connected with these technological problems are preferred)

Functional Food

- functional foods development
- production of novel food
- effects of processing and storage on the stability and biological activity of bioactive food components and their metabolites

Human Nutrition

- clinical tests of foods
- consumer preferences of standard and novel food
- diet and nutritional status assessment
- nutritional and health impacts of foods and food components

Abstracting/indexing

Web of Science Core Collection – Emerging Sources Citation Index, Medline, PubMed, Scopus, EBSCO, Food Science and Technology Abstracts®, CAB International, Chemical Abstracts Service, Index Copernicus, Ulrich's Database, Directory of Open Access Journals, Agro, Agris-FAO, Embase, ProQuest, CrossRef, Scimago, HINARI, JSTOR, Socolar.

Scientific Board of Acta Scientiarum Polonorum Technologia Alimentaria

Editorial Chief

Julita Regula

Department of Human Nutrition and Hygiene
Poznań University of Life Sciences, **Poland**
chairman@food.actapol.net
phone: +48 61 848 7339

Associate Editors

Dariusz Dzik

Food Engineering
Department of Thermal Engineering
University of Life Sciences in Lublin
Poland

Isabel M.P.L.V.O. Ferreira

Chemistry & Biochemistry
Department of Chemistry and Biochemistry
University of Porto, **Portugal**

Jacek Słupski

Food Technology
Department of Raw Materials and Fruit
and Vegetable Processing
University of Agriculture in Krakow
Poland

Joanna Suliburska

Functional Food & Food Additives
Department of Human Nutrition
and Hygiene
Poznań University of Life Sciences, **Poland**

Jarosław Walkowiak

Human Nutrition
Department of Gastroenterology
and Metabolism
Poznan University of Medical Sciences
Poland

Former Editors

Waldemar Uchman – Editor in chief

2002–2015
Poznań University of Life Sciences, **Poland**

Zofia Lisiewska – Associate editor

2002–2015
University of Agriculture in Krakow
Poland

Secretary of Editorial Board

Aleksander Siger

Poznań University of Life Sciences, **Poland**
secretary@food.actapol.net
phone: +48 61 848 7356

Members

Maria Daniel vaz de Almeida

University of Porto, **Portugal**

Bhaskar C. Behera

Agharkar Research Institute, **India**

Zbigniew Dolatowski

University of Life Sciences in Lublin
Poland

Bartłomiej Dziuba

University of Warmia and Mazury
in Olsztyn, **Poland**

Sylvian Guyot

INRA Centre de Rennes, **France**

Karl Heinz Herzig

University of Oulu, **Finland**

Berthold Victor Koletzko

University of Munich, Medical Centre
Germany

Zbigniew Krejpcio

Poznań University of Life Sciences, **Poland**

Andrea Laukova

Slovak Academy of Sciences, **Slovakia**

Andrzej Lenart

Warsaw University of Life Sciences –
SGGW, **Poland**

Carlos Lifschitz

Italian Hospital of Buenos Aires, **Argentina**

Bertrand Matthäus

Max Rubner-Institut (MRI), **Germany**

Abdalbasit Adam Mariod

King Abdulaziz University Jeddah
Saudi Arabia

Paul Edward Mozdziak

North Carolina State University, Raleigh
United States

Jan Oszmiański

Wrocław University of Environmental
and Life Sciences, **Poland**

Semih Ötles

Ege University, **Turkey**

Werner Praznik

University of Natural Resources
and Applied Life Science, **Austria**

Mikołaj Protasowicki

West Pomeranian University of Technology,
Szczecin, **Poland**

Roman Przybylski

University of Lethbridge, **Canada**

Eddy Robberecht

Universiteit Gent, Ghent, **Belgium**

Kazim Sahin

Firat University, **Turkey**

Alexander Shleikin

St. Petersburg State University, **Russia**

Martin Stern

Universitätsklinikum Tübingen
Medizinische Fakultät, Tübingen
Germany

Michał Świeca

University of Life Sciences in Lublin
Poland

Alexey A. Tinkov

Orenburg State Medical Academy, **Russia**

Diana Thomas

University of Sydney, **Australia**

Managing Team

Lucyna Borowczyk – text editor, lbor@up.poznan.pl, phone: +48 61 848 7807, fax: +48 61 848 7808
Hanna Chudzik – statistics consultant
Małgorzata Kapuścińska – English language consultant
Stanisław Tuchołka – computer typesetting, panbook.pl

Publisher and Owner

University Publisher Poznań University of Life Sciences Press
Witosa 45, 61-693 Poznań, Poland
phone: +48 61 848 7776, fax: +48 61 848 7808
e-mail: wydawnictwo@up.poznan.pl, <http://www.wydawnictwo.up-poznan.net>

The papers are published in English only, in four issues yearly.



Digitization and computer processing were financed based on agreement no. 773/P-DUN/2017 from the funds allocated by the Minister of Science and Higher Education for activities connected with popularization of science.

ISSN 1644-0730 (print) ISSN 1898-9594 (online)

Edition up to 60 copies. 13.6 publisher's sheets.

© Copyright by Wydawnictwo Uniwersytetu Przyrodniczego w Poznaniu

Print: Zakład Graficzny Uniwersytetu Przyrodniczego w Poznaniu
Wojska Polskiego 67, 60-625 Poznań