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Lipid Oxidation and Antioxidants in Food and Nutrition

Charlotte Jacobsen,* Fátima Paiva-Martins, Karin Schwarz, and Valery Bochkov

Lipid oxidation of foods gives rise to formation of unhealthy compounds, negatively affects sensory properties of foods and is an important contributor to reduced shelf life and food waste. In order to meet current nutritional recommendations, the content of polyunsaturated fatty acids in foods must be increased. This unavoidably leads to decreased oxidative stability. For these reasons, lipid oxidation and antioxidants continue to be important research topics of high relevance for both academia and industry, i.e., basic and applied research are required. Finally lipid oxidation has to be addressed in the light of the increased focus on sustainable food production to reduce food spoilage and to avoid disposal of food. In 2016, Euro Fed Lipid organized the 1st International Symposium on Lipid Oxidation and Antioxidants in Portugal. The aim was to share knowledge about recent progress in this important area and to discuss how research can be further advanced to develop even better solutions to prevent lipid oxidation in foods. The symposium was very well received by the participants and particularly demonstrated the need for a forum where methods used in lipid oxidation and antioxidant science can be discussed and further improved. Therefore, the Lipid Oxidation and Antioxidant Division of Euro Fed Lipid has decided to make this type of symposium a bi-annual event. The 2nd symposium took place in Graz, Austria in June 2018 and the 3rd symposium will take place in Vigo, Spain in 2020. The 2nd symposium included 29 oral presentations as well as many high quality poster presentations. The first session of the symposium concerned antioxidant and lipid oxidation evaluation methods and had Derek A. Pratt as the keynote speaker. The topic of his talk was radical trapping antioxidants and different methods to study their action and potency in cell models. Discussion of lipid oxidation and antioxidant mechanisms continued in the 2nd session, which was then followed by a session on nutritional and physiological effects of oxidized lipids and antioxidants. Konstantin G. Birukov was the keynote speaker in this session

and illustrated the complexity of biological action of lipid peroxidation products by discussing beneficial and deleterious effects of oxidized phospholipids in acute lung injury. The 4th session concerned lipid oxidation in multiphase and complex systems with Marianne Nissen-Lund as the keynote speaker. She provided an overview of interactions between polyphenols and proteins and their impact on food quality. The last session focused on control of lipid oxidation including both physical and chemical means of prevention of lipid oxidation. Jose M. Lagaron gave a keynote presentation on the use of electrospraying techniques for encapsulation of bioactive compounds. The symposium also included a round table discussion on good experimental practice for oxidation experiments with particular focus on accelerated vs storage experiments. The outcome of the round table discussion was a ring study on an oxidation evaluation method of vegetable oils stored at three different temperatures. The method chosen for this evaluation was the determination of the conjugated diene content of vegetable oils. The ring study was initiated in July 2019 and will be concluded before the end of the year. The statistical evaluation and interpretation of the laboratories' results will be a great help for all participating labs as it opens the possibility to assess the quality of their analysis compared to that of other laboratories.

Nine papers from the symposium are published in this special collection, which are accessible online at <https://onlinelibrary.wiley.com/toc/14389312/2019/121/9>. Hopefully, these articles will be a source of inspiration to more research and development into the important topic of lipid oxidation and antioxidants in food.

Guest Editors

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