



# **AISAM 2020**

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## ***BOOK OF ABSTRACTS***



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### **Vegetable oils protect phycocyanin from thermal degradation during cooking in spirulina-based "crostini"**

Phycocyanin (PC) is a known bioactive pigment contained in cyanobacteria, such as *Arthrospira platensis* (commonly known as spirulina), used in the food and beverage industry. PC is sold as a natural dye, e.g. Linablue® (sold by Earthrise® Nutritional) and EXBERRY® Shade Blue (sold by GNT Group B.V.), and it is also used to color ice cream, chewing gum and candy. The Food and Drug Administration (FDA) recently approved PC as a component for coatings of food supplements and pharmaceuticals. PC is considered a "functional" blue dye since it has various biological activities, including antioxidant, immunomodulating, neuroprotective and anticancer activities. One of the main problems of PC or spirulina-based bakery products is the degradation of the pigment during cooking being extremely sensitive to heat. The main objective of this work was to evaluate the protective effect against PC degradation by the tocopherol contained in vegetable oils, e.g. in extra virgin olive oil (EVO) or in sunflower oil, by applying heat treatments directly on *A. platensis* F&M-C256 biomass, on *A. platensis* F&M-C256-based "crostino" and on PC powder. After the heat treatment at 160 °C for 11 minutes, the "crostino" with *A. platensis* F&M-C256 biomass incorporated with EVO or sunflower oil (10 g of oil/100 g of dough) contained about 90% of PC originally present in the cyanobacterial biomass. When pure tocopherol was added to the biomass in the same quantities as vegetable oils, a significant effect in PC protection was obtained. The tocopherol contained in EVO and sunflower oil is primarily responsible for the protective action against thermal degradation of PC. The incorporation of EVO oil or sunflower oil into the dough is, therefore, a useful technological approach for food industries that intend to use *A. platensis* biomass and/or PC as a natural food coloring and bioactive component in bakery products.