

**Pot marigold-based nano-emulsions as a functional additive effective in the prevention of chronic non-communicable diseases****Kamil Haladyn<sup>1\*</sup>, Paulina Nowicka<sup>1</sup>, Aneta Wojdylo<sup>1</sup> and Ana Isabel Bourbon<sup>2</sup>**<sup>1</sup>Wrocław University of Environmental and Life Sciences, Poland<sup>2</sup>International Iberian Nanotechnology Laboratory, Portugal

**C**alendula is one of the oldest medicinal plants, characterized by a number of health-promoting properties. Due to its antioxidant and anti-inflammatory effects, the use of marigold extracts is gaining popularity. The therapeutic effect of calendula results from the presence of bioactive compounds such as carotenoid or polyphenols compounds. Unfortunately, bioactive compounds are highly labile and degrade quickly. As a result of various environmental factors (temperature, light, oxygen), these compounds lose their valuable properties. Hence, there is a need to protect bioactive substances against their destruction. This action can be achieved through the use of nano-emulsion production technology. Nano-emulsions are used as a carrier of the active substance. Due to the nano-metric scale of particle size, their absorption and bioavailability in the body is greater. Thanks to this, nano-emulsions can be used for more effective delivery of bioactive substances to the organism. This feature will allow the use of nanostructures to design functional foods with specific health-promoting properties.

Therefore, the aim of the work was to design a calendula-based nano-emulsion as a potential food additive with a prophylactic effect in the context of chronic non-communicable diseases.

The results of the study of antioxidant activity (ABTS, ORAC), antidiabetic properties (expressed as the ability to inhibit  $\alpha$ -amylase and  $\alpha$ -glucosidase) and anti-aging properties (ability to inhibit acetylcholinesterase and butyrylcholinesterase) show that the obtained nano-emulsions can be an interesting food additive in the context of preventing civilization diseases. This is due to the high content of carotenoid compounds and tocopherols, determined by the UPLC method.

**Biography**

Kamil Haladyn is currently a PhD student at the Wrocław University of Environmental and Life Sciences. He has done Master of Science in Food Technology and Human Nutrition. He is a member of the Plant Food research group at the University of Life Sciences in Wrocław. Throughout his studies, He was a member of the Student Research Clubs, of which today he is the auxiliary supervisor. Since 2022, he has been a member of the Polish Society of Food Technologists.

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