Title:

Biofunctional ice cream from novely prepared oat milk for enhancing nutritional profile and supporting *Lactobacillus acidophilus* during frozen storage

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Abstract:

The growing demand for plant-based and functional foods has driven the development of innovative alternatives. Oat milk (OM), with its unique nutritional and health benefits, has arisen as a promising ingredient in various food products. The study investigates the development of modified OM for novel biofunctional ice cream preparation supporting the probiotic Lactobacillus acidophilus, as an alternative to traditional dairy-based ice cream. The preparation involved α-amylase treatment during soaking (without heating) and cold-water blending to mitigate viscosity and browning issues inherent to OM processing. Replacing skim milk with OM (25–100 %) maintained the nutritional profile while improving the viability of L. acidophilus through frozen storage. The improved physicochemical, rheological, and nutritional features positively impacted overrun, viscosity, glucans, phenolic compounds, antioxidant activity, and probiotic viability. Sensory analysis revealed favorable consumer acceptance. The 75 % OM substitution ratio demonstrated optimal physicochemical properties (overrun, viscosity, and sensory appeal), while the 100 % OM formulation exhibited the lowest carbohydrate and ash content. Taken together, such new OM-based ice cream may better contribute to sustainability and health-promoting. Future research should focus on molecular interactions between oat components and probiotics, nutrient fortification, wide consumer acceptability, and in vivo efficacy to further optimize and validate the health benefits of OM-based ice cream.

Biography:

Mahmoud M. Refaey :Assistant Professor in Dairy Science and Food Technology at Mansoura University, Egypt, with 18+ years of experience in higher education, scientific research, and academic supervision. Strong record in academic publishing, funded research management, and curriculum

development. Expert in functional dairy product manufacturing, dairy chemistry, dairy microbiology, food engineering, and biotechnology, with a special focus on innovation and modern technology applications to enhance food quality and safety.

Example: [Author's Name] is a [Designation] at [University/Department] in [Institution/Hospital], [State], [Country]. With expertise in [Area of Expertise], they have contributed significantly to [Relevant Achievements]. Their research interests include [Research Interests].

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