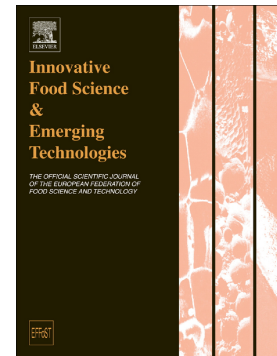


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Small-scale food process engineering — challenges and perspectives

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Abstract

Technological innovations in the food sector have been driven by high-volume production lines over the past decades. Cost-efficiency of processing and price competitiveness of final products have been major factors. The economics of up-scaling have led to new technologies that are more efficient in terms of throughput and utilization of (homogenous) resources. The question now is whether there is a future for competitive, sustainable processing at small scale. To answer that question, we address two major issues. The first deals with process efficiency and the reliability and resilience of technologies for small-scale processing to be competitive. The second deals with localization of processing and the advantages and disadvantages of technologies for small-scale processing. Novel technologies, especially those based on electro-thermo-dynamic principles, may emerge with characteristics that appear more beneficial for applications at small-scale, and so may well contribute to the competitiveness of local producers of food and biobased products valorizing renewable resources in an integrated manner for a variety of business sectors. However, these novel technologies should go hand in hand with end-to-end innovation of the local food and biobased product system in order to be competitive with international-scale enterprises.

Keywords: modeling; printability; food physics; food systems; complex biobased systems; food engineering;

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