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Short Communication

The new research methodology of bio research for food science

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Abstract

Current societal challenges and recent knowledge acquisition now provide the conditions for the renewal of our collective vision of food science and technology. To meet increasingly complex challenges, it obvious that current reductionist approaches in food science must give way to a knowledge-intensive framework for function-driven research and innovation. This implies a need for more in-depth, multistate characterization of bio resources, leading to the detailed description of functional entities molecules, macromolecules, substructures and assemblies and the development of new transformation technologies. These must provide the underpinning knowledge to devise specific transformations, using minimal energy and water inputs, and generate the targeted end-user products. We should thus consider food manufacturing as a complex systems problem, dealing with heterogeneous product matrices agents and changing processing conditions environmental context non-linear behavior phase changes novel functional properties emerging phenomena etc. Accordingly, we propose a new research methodology and innovation agenda, hereby utilizing the knowledge that we have gained in the past decade and described in this Special Issue.

Keywords: Sustainability food, Systems conceptual, Principles food science and technology

INTRODUCTION

These methods are responses to the present linear take build consume lose chains, that are related to mass consumption and unsustainable behavior of actors. These chains typically end in waste over-exploitation of natural resources competitive claims for resources food and organic process insecurity. Various indicators show (exponential) growth patterns (e.g. For temperature change, variety loss, overweight and avoirdupois, energy, and water usage, urbanization, social inequalities presumably with severe consequences for the world, profits, and also the well-being of individuals (Dabirian et al., 2019).

Systems showing continuous overall (exponential) growth patterns tend to finish up in chaos or order as explained by the laws of physical science series of tiny and huge scale events following power laws, like avalanches on a growing sand pile The zone in between order and chaos, referred

to as the melting zone is slim, however, with a precise information measure. One will theorize that systems endlessly evolving during this zone are property naturally, as additional mentioned below. This could additionally hold for bio economy systems that are here outlined as systems that organize the employment of bio-based product together with natural resources at intervals bound boundaries appreciating its wider environmental, social, political and economic context (Li et al., 2018).

Sustainability and property bio economy systems are currently wide mentioned utilizing the definition because the basis thus, they integrally contemplate the 3 pillars planet, individuals and profit' and specific actions that may not compromise future generations. However, the understanding of the functioning of bio economy systems and also the thanks to modification the present trends are less obvious, above all at the worldwide and European levels however additionally native levels (Holscher et al., 2014)

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The appealing construct of a circular economy as re-introduced by the wide been promoted within the past decade. It mostly emerged from legislation even supposing closed-loop thinking already exists since the start of agricultural production by feeding back essential nutrients to the soil. The success of the circular bio economy approaches can depend upon transformation prices like cash, water, energy, and safety measures for the recovery and utilization of nutrients somewhere within the bio economy. To determine whether or not or not environmental property is additionally at stake, a sound scientific basis is needed supported physical science and system. Social property deserves attention furthermore. Here, we tend to prefer to remark that the mathematical illustration of a circle implies equally truthful and simply distances for all actors at the circle to its center and also the absence of a starting or finish. Thus shared responsibilities for all being suppliers and demanders at the circle (Fang et al., 2018).

SBS wants metrics and joint actions to know and live the impacts of current actions besides they need resources, multi-level and landscape oriented approaches the landscape refers to the general socio-technical setting for interactions of actors. Finally, they raise revived concerns of planetary boundaries given as radars the boundaries are related to the planet's biophysical subsystems or processes. An alternate

image may be a Doughnut within which additionally social limits are incorporated the image of a doughnut shows a circle representing the social foundation and also the outer circle serving because the ecological ceiling or planet's biophysical limits. On the far side the ecological ceiling, one will discuss unacceptable environmental degradation, whereas below the social foundation the human primary wants are essentially challenged (Davinelli et al., 2018).

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