

Welcome to the latest views & perspectives of the future of food

INSIDE

Domestication of microorganisms

Microorganisms will produce everything we consume, using less land, energy, resources.



Domestication of microorganisms

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In our previous "loophole letter", we delved into a discussion that resonates with the very essence of our modern society: How do we sustainably, healthily, affordably, and accessibly feed a population of 10 billion, both on Earth and in the uncharted expanses of space? The conundrum is monumental, prompting us to scrutinize the intricate web of challenges woven into the fabric of our existence.

Over the preceding years, we have borne witness to four seismic shifts, each carving out the contours of a paradigm so revolutionary that it promises to redefine the fundamental dynamics of feeding the colossal 10 billion.

First and foremost, microorganisms emerge as a pivotal force, promising to manufacture every facet of our consumption. In a parallel of the historical agricultural revolution built on the domestication of crops and animals, the forthcoming "space revolution" pivots on the domestication of microorganisms, the microbial future. This metamorphosis will endow us with the ability to produce at an unprecedented scale, encompassing not only

food but also clothing, building materials, and all essentials through biological processes, though not yet at the scale required for a complete overhaul of current production methodologies.

The second tectonic shift ushers in the era of artificial intelligence (AI) and robots, poised to shoulder the bulk of the workload. Amidst palpable advancements in robotics and AI, skepticism and apprehension persist regarding the specific applications and their impact. Our perspective contends that the true triumph of AI and robots lies in managing complexity. In contrast to the prevailing ethos of reducing complexity for economies of scale, AI enables the operation of numerous smaller sites efficiently, closer to consumers, crafting tailor-made products on a grand scale.

Simultaneously, renewable and nuclear energy ascend as economic victors, replacing fossil fuels and heralding an era of cleaner, more affordable energy. This dual energy source also grants flexibility to adapt to fluctuating energy demands, sidestepping costly peaks and troughs.

A fourth transformative wave promises to erase the demarcation between natural and artificial. The dichotomy that distinguishes food from the field as natural and that from a greenhouse as artificial is slated for dissolution. Consumers will instead discern more between "processed" and "non-processed," as a more relevant distinctions.

The ramifications of these trends reverberate across the entire food ecosystem, from cultivation to consumption:

- **Arable land becomes obsolete**, reclaiming 38% of the total landmass, requiring less water for food production as microorganisms exponentially enhance biomass concentration.
- **Food production becomes climate-independent**, unshackled from geographical constraints. Controlled microorganism-based manufacturing processes can flourish in cities, deserts, or even the Antarctic, meeting nutritional needs wherever and whenever they arise.
- **Localized production supplants the need for transporting food** over long distances. Financial viability aligns with smaller, more tailored, and just-in-time production models, shattering the one-size-fits-all paradigm.
- **Edibility encompasses everything**, from ingredients to packaging, as biological processes underpin the entire manufacturing framework. A circular economy, laden with complexities and waste, becomes unnecessary.

This emerging paradigm envisions a world where food is grown sans land or animals, available anytime, anywhere, on-demand, and tailored to specific needs. It hinges on the mastery of microorganisms, the efficiency of AI and robots, cost-effective energy solutions, and limited processing.

While this integrated food manufacturing system remains in its embryonic stage, the foundational elements beckon us to orchestrate a synthesis that can sustain and nourish our burgeoning population. Challenges loom on the path to industrialization, demanding concerted efforts to propel this vision into a tangible reality.

Food, an enduring catalyst of innovation and societal evolution, assumes an even more pivotal role in this narrative. As we unravel the intricacies of this paradigm shift, we gain profound insights into the future, where food remains the linchpin that propels our daily lives and societal activities.

Get in touch!

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