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Shifting Obstacles to Opportunities

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Abstract

Postprandial While waste management, plastics production, and recycling sectors at first glance appear only tangentially some places linked, some places not linked to essential services, they are intimately connected to a thriving economy and critical public health roles [1]. The uncertainties associated with the pandemic have caused significant limitations on recycling and municipal waste services. Meanwhile, the likely decrease in plastic waste generation due to the global decline in economic activity, no collection and transportation or reduced collection rates and programs where inventory may not make it into the waste and recycling system until post-pandemic has been significantly muted by the needs associated with the pandemic [2]. As a result, more recyclables are being disposed of in the traditional waste processes-landfill and incineration [3]. The behavior is additionally supported by precipitous drop in oil prices that makes manufacturing of the recyclable commodities cheaper [4]. This challenges the goals of sustainability but also displays the deficiencies of short-term and product-based solutions to the plastics waste issue while stressing the need for a systems-level approach [5].

Keywords: Bioremediation; Biodegradation; Recycling

Introduction

The global demand for certain uses of plastics has increased due to the coronavirus [6]. The polymers polypropylene, used in lifesaving medical equipment such as N-95 masks and in takeout food packaging, polyethylene used in protective suits and PET in single-use plastic water bottles and medical face shields have all seen a rise in demand as the COVID-19 pandemic plays out [7]. With restaurants shifting to take- out, consumers stockpiling groceries and bottled water, and the medical community rapidly turning over personal protective equipment (PPE), there has subsequently been an uptick in plastic waste, municipal solid waste from residences, and hazardous waste generated from healthcare facilities, including quarantine sites, that are infected with COVID-19 [8]. However, overall plastic waste generation has likely decreased [9]. Due to the uncertainties around the risks associated with the transmission of COVID-19 to frontline solid waste workers and the survivability of the coronavirus on various surfaces, many municipalities, airlines, and other corporations have responded by shuttering their collection and recycling programs and taking protective measures on how solid waste is managed [10]. In an industry already overwhelmed with challenges, materials that would normally find its way to recyclers are being channelled directly as solid waste to landfills and incinerators out of an abundance of caution [11]. Things will mature and solutions will evolve [12]. One important thought is on packaging [13]. Packaging sizes will change [14]. It is generally accepted that the packaging industry needs to come up with more wide-ranging solutions to its many and varied sustainability challenges [15]. But there is no 'one-size-fits-all' approach, as we're all very aware [16]. Gerald Rebitzer, Director Sustainability at global rigid, flexible and carton packaging producer Amcor, about the methods I proposes: has put forth a good concept of the Seven Pillars of Sustainability He said "From my experience talking to people from many different facets of the packaging supply chain, one thing I have become increasingly aware of is that, while everyone agrees that we need to be more sustainable as an industry and as a society, there is little agreement on what this actually means [17]. Some advocate passionately for recyclable plastics within a circular economy while others favour compostables; some extol the benefits of glass, some metal, and so on [18]. But what if nobody is 'right'? What if it's more a case of recognizing the uniqueness of each scenario and finding the best solution within that context? This, it seems, is what Amcor's seven pillars are attempting to address [19]. "Our intent with focusing on seven sustainability options is to give brands a clear starting point for actions they might take to switch to more environmentally friendly packaging [20]. We then work together with our customers to tailor a solution for their specific product and market. "And options can of course be combined in order to produce the optimal packaging with a holistic life cycle perspective in mind for example, a bio-based PE pouch made from sugar cane that is also recyclable and has a lower carbon footprint than the product's previous packaging [21]."

PCR (Post Consumed Recyclables)

Five Materials that have served their purpose (have been used by the consumer) and subsequently been recycled to produce a new product [22].

Bio Based Materials

Materials derived from renewable resources such as corn, sugar cane or trees [23].

Responsible Sourced Materials

Raw materials sourced from socially and environmentally responsible suppliers, as confirmed by certification agencies [24].

Lower Carbon Footprint

Packaging that has a lower life cycle carbon footprint than common alternatives, e.g. due to material selection, design or improved recycling performance [25].

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Recyclable

Packaging that meets accepted design standards for recyclability, i.e. packaging with the right attributes for successful collection, sorting, and recycling in the real world.

Compostable

Materials that biodegrade in a commercially managed or home composting system according to the relevant industry standards.

Resusable

Packaging that is refilled or used again for its original purpose.

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Competing Interests

All authors declare no competing interests

Author Contributions

All authors planned the study. MH screened control patients and performed mixed meal testing. KA and PW did PET/CT readings. MH, KA, and PW did the analysis and wrote the first draft of the manuscript. All authors critically proved data, edited and approved the manuscript.

Data Availability

All data is available from the corresponding author on request.

Ethics approval

The study was approved by the local ethics committee (Ethikkommission Nordwest-und Zentralschweiz, Basel, Switzerland, EKBB 163/12).

Consent to participate

Informed consent was obtained from all individual participants included in the study.

Consent to publish

All authors approved the manuscript for submission

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