Acta Scientific MEDICAL SCIENCES (ISSN: 2582-0931)

Volume 9 Issue 8 August 2025

Editorial

Edible Oil in Plastic Packaging: A Potential Source of Plastic Pollution

Sonal Sangwan, Rajasri Bhattacharyya and Dibyajyoti Banerjee*

Department of Experimental Medicine and Biotechnology, Post Graduate Institute of Medical Education and Research, Chandigarh, India

***Corresponding Author:** Dibyajyoti Banerjee, Department of Experimental Medicine and Biotechnology, Post Graduate Institute of Medical Education and Research, Chandigarh, India.

Received: May 23, 2025

Published: July 01, 2025

The use of plastic packaging for edible oils has become widespread due to its cost-effectiveness, lightweight nature, and durability properties [1]. However, this convenience comes at a significant environmental and public health cost. Plastic is now a major contributor to pollution, with about 36% of global plastic production used in food packaging, including single-use containers for edible oils. Much of this plastic ends up in landfills or oceans—over 8 million tons annually—posing serious ecological and human health risks (UNEP report, 25 APR 2023). Plastics break down into microplastics that contaminate marine ecosystems and enter the food chain [2]. Reports are abundant where microplastics and phthalates are found in the packaged edible oil [3]. Additionally, chemicals such as Bisphenol A (BPA) and phthalates can leach from plastic packaging into edible oils, especially under heat or prolonged storage [4]. BPA is an endocrine disruptor linked to reproductive issues, metabolic disorders cancer, while phthalates are associated with developmental and fertility problems [5,6]. These concerns have spurred calls for safer and more sustainable packaging options.

Efforts to address these issues include exploring alternatives like biodegradable and compostable packaging made from renewable resources [7]. Bioplastics, for instance, offer moderate protection for food products while reducing greenhouse gas emissions. Polylactic acid (PLA) showed promising results with minimum leaking out of harmful chemicals when stored in other plastics for 9 months [8]. Compostable packaging can break down into non-toxic components under specific conditions, though widespread adoption faces challenges including higher costs and limited consumer awareness [9]. Recyclable materials such as glass, certain plastics, and cardboard are also viable, though global recycling rates remain low [10]. Innovations like edible films and reusable textile-based wraps further illustrate the potential of sustainable packaging, yet these too must overcome barriers related to performance, pricing, and infrastructure [11,12]. For meaningful progress, a multi-faceted approach is required. Education and awareness are key to bridging this gap. Governments, businesses, and consumers must collaborate to promote sustainable packaging, improve recycling systems, and support innovation.

In conclusion, while plastic packaging for edible oils provides short-term convenience, it poses long-term risks to both the planet and public health. Shifting toward sustainable alternatives is essential, and this transition hinges on greater awareness, supportive policies, and responsible consumer behavior. Together, these efforts can reduce plastic pollution and enhance food safety, driving a healthier and more sustainable future.

Bibliography

1. Hotchkiss JH. "Food-packaging interactions influencing quality and safety". *Food Additives and Contaminants* 14.6-7 (1997): 601-607.

2. Marcharla E., *et al*. "Microplastics in marine ecosystems: A comprehensive review of biological and ecological implications and its mitigation approach using nanotechnology for the sustainable environment." *Environmental Research* 256 (2024): 119181.

3. Ciemniak A and Kuźmicz K. "Effect of a packaging material type on PAHs contents in oils and water". *Journal of Stored Products Research* 92 (2021): 101810.

4. Wang Y and Qian H. "Phthalates and Their Impacts on Human Health". *Healthcare* 9.5 (2021): 603.

5. Sangwan S., *et al*. "Plastic compounds and liver diseases: Whether bisphenol A is the only culprit". *Liver International* 44.5 (2024): 1093-1105.

6. Palsania P., *et al*. "Food grade plastics and Bisphenol A: Associated risks, toxicity, and bioremediation approaches". *Journal of Hazardous Materials* 466 (2024): 133474.

7. Song JH., *et al*. "Biodegradable and compostable alternatives to conventional plastics". *Philosophical Transactions of the Royal Society B* 364.1526 (2009): 2127-2139.

8. Carla Zarazir., *et al*. "Impact of Plastic Packaging Materials and Storage Time on the Quality Parameters of Lebanese Extra Virgin Olive Oil under Real-Time Storage Conditions". *American Journal of Analytical Chemistry* 10 (2019).

9. Moshood TD., *et al*. "Sustainability of biodegradable plastics: New problem or solution to solve the global plastic pollution?" *Current Research in Green and Sustainable Chemistry* 5 (2022): 100273.

10. Singh N and Walker TR. "Plastic recycling: A panacea or environmental pollution problem". *npj Materials Sustainability* 2.1 (2024): 17.

11. Nair SS., *et al*. "Edible Packaging: A Technological Update for the Sustainable Future of the Food Industry". *Applied Sciences* 13.14 (2023): 8234.

12. Versino F., *et al*. "Sustainable and Bio-Based Food Packaging: A Review on Past and Current Design Innovations". *Foods* 12.5 (2023): 1057.