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Effect of Fatty Acid Present in Cooking Oil on Gut Barrier Function

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Abstract: *Understanding the impact of fatty acids present in cooking oils on gut barrier function is critical for elucidating their role in gastrointestinal health. This review investigates the effects of Fatty acid and Edible oil on gut barrier integrity using a multifaceted approach, including transepithelial electrical resistance (TEER) assays, trypan blue exclusion assays, and MTT assays. Epithelial cells were seeded onto Transwell inserts to form tight monolayers, reflecting the physiological epithelial barrier. Treatment with varying concentrations of FA and EO, alongside appropriate controls, revealed concentration-dependent effects on TEER values, indicating alterations in barrier integrity. The inclusion of trypan blue exclusion assays allowed for the assessment of cell viability, highlighting the cytotoxic effects of fatty acids on epithelial cells. Graphical representations illustrated the differential impacts of EO and FA on cell viability and gut barrier function. Furthermore, the introduction of lipid micelle preparations as a treatment parameter aimed to mimic physiological conditions post-consumption of fatty acids, enhancing the relevance of experimental models. MTT assays in 96-well plates provided complementary insights into cell viability in response to different concentrations of fatty acids and edible oils, demonstrating a trend of increasing cell viability from high to low concentrations. Fatty acid exhibited concentration-dependent decreases in cell viability and TEER values, suggesting a potential compromise in barrier integrity. Conversely, Edible oil displayed milder effects, indicating a less detrimental impact on gut barrier function.*

Keywords: Edible oil, Fatty acids, MTT assay, Monolayers, Cooking oils

Abbreviations: Inflammatory Bowel Disease (ibd), Monounsaturated fatty acid (mufa), Polyunsaturated fatty acid (pufa), Toll-like receptors (tlr), Nuclear factor kappa B (nf-kb), Short-chain fatty acid (SCFA), Conjugated linoleic acids (cla), Nanoparticle Tracking Analysis (nta).