Commentary
Volume 8:3, 2022

Journal of Food & Industrial Microbiology

ISSN: 2572-4134 Open Access

Food Emulsifiers and Metabolic Syndrome: Commentary

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Description

In the last few centuries, modern society has undergone significant socio-economic and cultural transformations. Reduced cooking time and a preference for processed foods among the populace are results of increased productivity and work optimization. These modified or "ready-to-eat foods" are laden with additives that may have a negative impact on our health. The most popular food additives in butter, milk, mayonnaise, sauces, ice creams, and pastries are emulsifiers [1].

They have a crucial functional and technological role in facilitating the blending of processed foods that contain immiscible food components, such as oil and water. An emulsifying agent's basic structure consists of a charged or uncharged hydrophilic portion and a hydrophobic portion. They are therefore at the point where water and fat converge, preventing the separation, melting, or precipitation of food constituents. Lecithins, mono- and diglycerides, polysorbates, carrageenans, guar gums, and carboxymethylcellulose are examples of common emulsifiers. Calories, proteins, lipids, and glucides are not present in emulsifiers. Therefore, emulsifiers first appear to be safe for customers with metabolic syndrome, such as diabetics and/or obese patients. However, recent research revealed that some emulsifiers may worsen metabolic problems by altering gut microbiome [2].

Emulsifiers in processed meals may promote bacterial translocation through the gut epithelium, leading to inflammation, according to a novel theory put forth by researchers. This translocation results from an increase in mucosal permeability, which may be brought on by inflammatory lesions or dysbioses, which are diseases of the gut microbiota [2,3]. The translocation of tryptophan-derived metabolites and lipopolysaccharide (LPS) results in metabolic endotoxemia and persistent low-grade systemic inflammation [3,4]. A complex pathophysiological condition with an incidence resembling a global epidemic is the metabolic syndrome. The metabolic syndrome is a medical disease that includes obesity, insulin resistance, hypertension, hyperlipidemia, and a high waist-to-hip ratio, according to the World Health Organization. Three or more of the aforementioned requirements must be met in order for metabolic syndrome to exist. A risk factor for the development of chronic illnesses such as cardiovascular disease, type 2 diabetes, chronic kidney disease, and various forms of cancer is the metabolic syndrome. Numerous studies have suggested that the gut microbiota may affect numerous risk factors for metabolic syndrome by interacting with the host's metabolism.

More than 260 different emulsifier kinds are listed in the Codex Alimentarius, which categorised them based on their intended uses. However, the Food Standard Agency (FSA) only includes 63 emulsifying agents on its list. There are 171 emulsifiers and emulsifying salts on the list provided by the American Food and Drug Administration (FDA). Through lifestyle changes, the rapid social and environmental change affecting our planet has distorted food consumption. Modern society's daily schedule has altered, and eating is now given less consideration. People's preferences and choices have been altered by the practise of "dining out." Consumption of prepared, processed, and industrial foods has increased while the nutritional value of healthy foods has decreased. Some fundamental components such as olive oil, fruits, and vegetables are consumed less and replaced by diets rich in fats and proteins with quality aspects that are often lacking [4,5]. As a result, there has been a sharp rise in disorders linked to metabolic disruption, including metabolic syndrome, type 2 diabetes, cardiovascular disease, and obesity.

Contrarily, normal-weight teenagers did not exhibit this striking difference. The synthesis of SCFAs by the gut microbiota can affect the metabolic syndrome. Acetate, propionate, and butyrate are the key SCFAs that support intestinal cell regeneration and protection, mucin synthesis, lowering levels of hypercholesterolemia, and the release of hormones and/or neurotransmitters crucial for controlling intestinal motility and insulin resistance. Certain bacterial species facilitate the conversion of bile acids to the salified form by producing the hydrolysis enzyme for bile acids. This facilitates the breakdown of lipids and lowers serum cholesterol levels. Both *in vivo* and clinical investigations have shown that the administration of probiotics and prebiotics together has anti-obesity benefits [5]. The metabolic syndrome may be treated with diet, prebiotics, and probiotic supplementation that modifies microbiota. *In vivo* models tend to benefit from the administration of both Bifidobacteria and/or Lactobacilli.

Conflicts of Interest

The authors declare no conflict of interest.

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Date of Submission: 02-May-2022, Manuscript No. jfim-22-70379; **Editor assigned:** 04-May-2022, Pre QC No. P-70379; **Reviewed:** 18-May-2022, QC No. Q-70379; **Revised:** 23-May-2022, Manuscript No. R-70379; **Published:** 30-May-2022, DOI: 10.37421/2572-4134.2022.8.243

How to cite this article: Bemrah, Volatier. "Food Emulsifiers and Metabolic Syndrome: Commentary." J Food Ind Microbiol 8 (2022): 243.