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**Your digestive Health:
A Healthy Gut From the start**

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Your Digestive Health:
A Healthy Gut From the Start



In the Name of God

Impact of Safety Food on Healthy GIT

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افزودنیهای غذایی (Food additives)

Food additives are defined as substances that are intentionally added to food in a technological process and are not consumed alone as food

امولسی فایرها (Emulsifiers)

نگهدارنده ها (Preservatives)

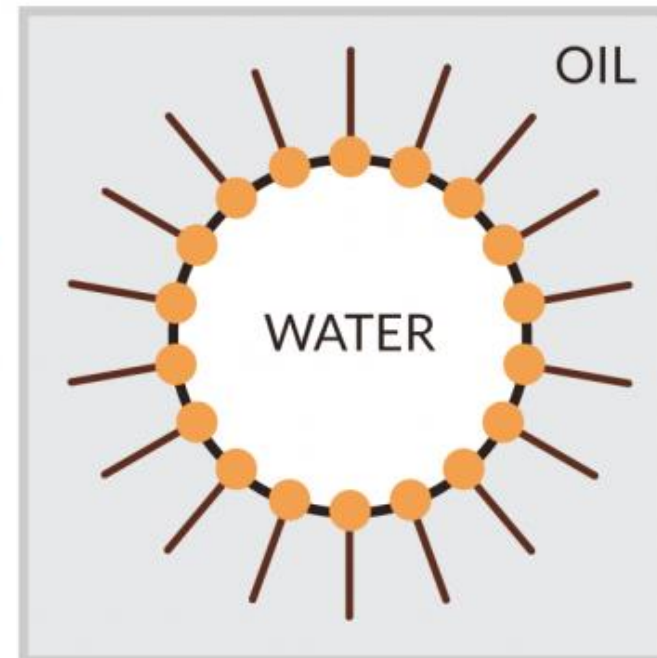
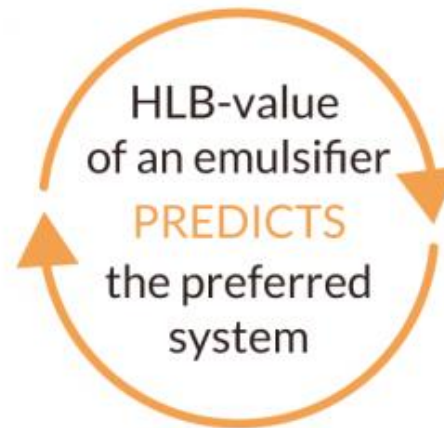
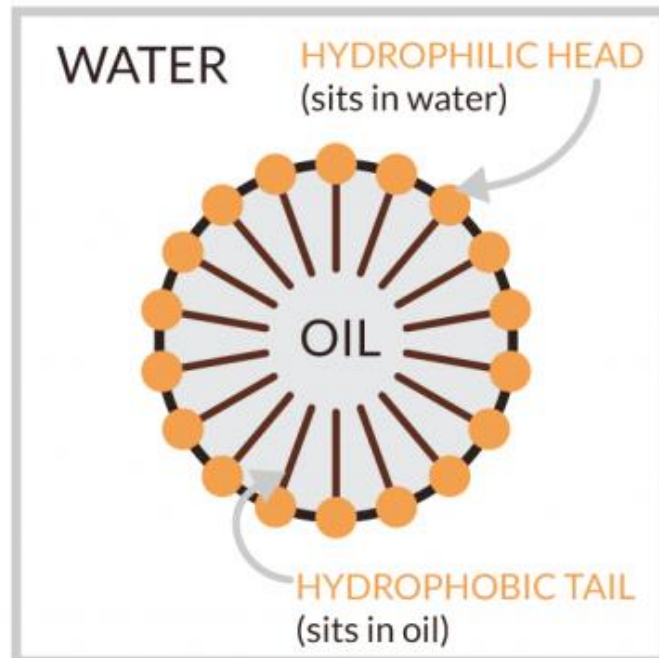
رنگ دهنده ها (Colorings)

طعم دهنده ها (Flavor enhancers)

Emulsifiers



AMPHIPHILIC EMULSIFIERS IN ACTION



Emulsifiers

- Chassaing et al. found in their study conducted on mice that emulsifiers can cause disturbances in the composition of the intestinal microflora, which in turn can lead to enteritis and the development of metabolic syndrome.
- Viennois et al. also demonstrated that food emulsifiers directly affect the intestinal microbiome by changing the expression of bacterial genes, increasing their pro-inflammatory activity.
- Chassaing et al. clearly described the negative effects of emulsifiers on the gastrointestinal tract. The use of foods rich in these supplements may be associated with an increase in pathogenic microorganisms, their translocation and the development of inflammation in animal models.
- Roberts et al. reported finding a correlation between consumption of food rich in emulsifiers and the incidence of CD. Even consumption of low doses of emulsifiers with food can lead to damage to the intestinal epithelium.

Preservatives



Nitrates/Nitrites/N-Nitroso compounds

- In the context of impact on human health, nitrite/nitrate and related nitrogen species such as nitric oxide (NO) are a matter of increasing scientific controversy. An increase in the content of reactive nitrogen species may result in nitrosative stress—a deleterious process, which can be an important mediator of damage to cell structures, including lipids, membranes, proteins and DNA.
- To date, no positive correlation of plant-based nitrate/nitrite has been reported with cancer. On the contrary, high intake of these compounds from processed animal-based foods is related to an increased risk of gastro-intestinal cancer. Nitrate in drinking water also raises some concern, because it appears to be related to adverse health effects.

colorings



colorings

- Research from Southampton is particularly important in the history of research into food colorings. It tested how tartrazine (E102), allura red (E129), quinoline yellow (E104), cochineal red (E124), orange yellow (E110) and azorubine (E122) affect behaviour in children. Increased hyperactivity, anxiety or reduced concentration were observed in the group.
- Zsila et al. describe the impact of colorings on human LL-37 peptide. LL-37 has antimicrobial activity, but also has an effect predisposing to the occurrence of certain diseases, e.g. UC or CD.
- Titanium dioxide, widely described in the literature and designated with the symbol E171, belongs to the group of colorings.

Flavor enhancers

- Holton et al. examined how monosodium glutamate (MSG) affects the occurrence of symptoms with diagnosed irritable bowel syndrome and damage to the DNA strand.
- Zeng et al. after a meta-analysis of studies detected a positive risk of CD in correlation with high sucrose intake.
- Racine et al. in their study of eating habits and their association with IBD revealed a relationship between the consumption of sugar and sweet non-alcoholic beverages and the occurrence of UC
- Wang et al. Conducted a case-control research over 3 years in 17 hospitals, which showed that UC patients were more likely to eat spicy foods and sugar compared to the control group. In their next work they described a positive correlation of sucrose intake (10 g/day) with the risk of UC.

- It is hypothesized that saccharin and sucralose can cause a change in the intestinal microflora and damage the intestinal barrier by degrading mucus in the intestines
- Polyols such as sorbitol or xylitol consumed in large quantities may also increase intestinal dysbiosis or predispose to inflammation.



SUMMARY



- Considering the ubiquitous use of food additive in processed food, the long-term impact of food additives on gut microbiota
- Whether the changes of specific microbial species caused by food additives could lead to corresponding changes in metabolic and immune functions





<https://gutmicrobiotaforhealth.ir/>

References

- Jarmakiewicz-Czaja S, Piątek D, Filip R. The impact of selected food additives on the gastrointestinal tract in the example of nonspecific inflammatory bowel diseases. *Archives of Medical Science*. 2022 Sep 1;18(5):1286-96.
- Halmos EP, Mack A, Gibson PR. emulsifiers in the food supply and implications for gastrointestinal disease. *Alimentary Pharmacology & Therapeutics*. 2019 Jan;49(1):41-50.
- Cao Y, Liu H, Qin N, Ren X, Zhu B, Xia X. Impact of food additives on the composition and function of gut microbiota: A review. *Trends in Food Science & Technology*. 2020 May 1;99:295-310.
- Kotopoulou S, Zampelas A, Magriplis E. Dietary nitrate and nitrite and human health: a narrative review by intake source. *Nutrition Reviews*. 2022 Apr;80(4):762-73.
- Yachmin AI, Yeroshenko GA, Shevchenko KV, Perederii NA, Ryabushko OB. Monosodium glutamate (e621) and its effect on the gastrointestinal organs.
- Karwowska M, Kononiuk A. Nitrates/nitrites in food—Risk for nitrosative stress and benefits. *Antioxidants*. 2020 Mar 16;9(3):241.
- Moradi M, Razavi R, Omer AK, Farhangfar A, McClements DJ. Interactions between nanoparticle-based food additives and other food ingredients: A review of current knowledge. *Trends in Food Science & Technology*. 2022 Jan 5.



Thank
you!