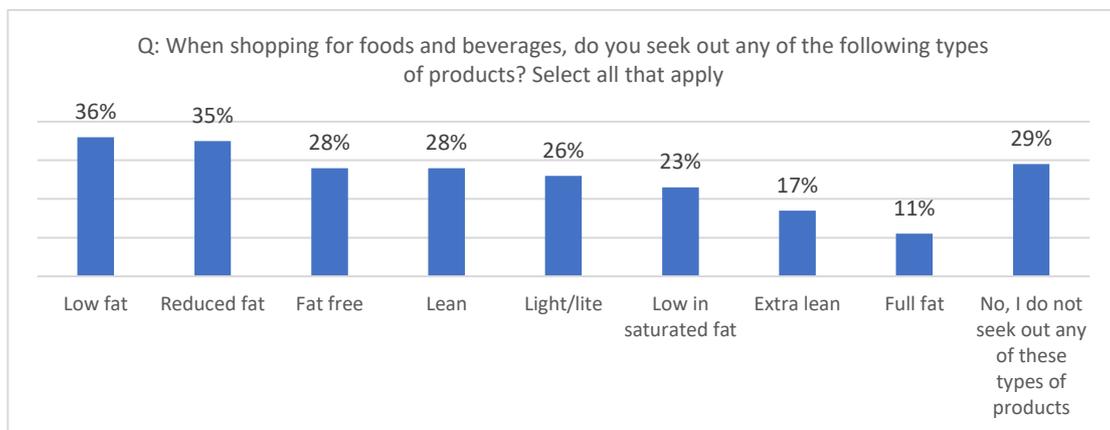


Thinning The Fats in Margarines



In today's contemporary world, a healthy diet has become one of the top priorities for health-conscious consumers as they realize that excessive dietary fat intake over time can lead to weight gain and non-communicable diseases like cardiovascular disease, diabetes, stroke and cancer¹².



According to the IFIC Consumer Research, more than 35% of respondents are looking for low-fat and reduced-fat food products. This is especially more apparent in the elderly age group and better-educated community who shows more interest in “low in saturated fat” labelling³. The rising health awareness of consumers is indeed driving the interest and overall acceptance of low-fat food products in the commercial market⁵.

Margarine was created as an inexpensive alternative to butter with similar properties⁵. It behaves as a water-in-oil emulsion of which the traditional margarine generally comprises of 70-80% of fat⁶, while reduced-fat and low-fat spreads typically contains approximately 60% & 40% of fat respectively¹⁰. It is widely recognised that fat plays a crucial role in food by providing a desirable flavour, taste and mouthfeel, and its reduction may lead to unfavourable qualities⁷. The trend for healthy eating is expected to continue and it will be a key factor for the reformulation of low-fat products to taste just as good as the original versions by incorporating suitable fat replacers⁷.

Inulin - An ideal fat replacer?

Inulin, is a soluble prebiotic fibre that is commonly found in chicory roots⁶. Inulin is not only applied to food products as a sugar replacement, but also serve as a fat replacer. When inulin is thoroughly mixed with water, it forms an inulin gel with a creamy texture and an appropriate consistency which can be easily incorporated into low-fat food products to create fat-like mouthfeel¹.

A recent study has examined that low-fat margarine, through substitution of 40% of inulin gel contributes a smoother texture with good spread ability and appears to have optimal sensory attributes. It is worth noting that the appearance of the margarine gets lighter and had no significant effect on the aroma as the content of inulin increases. Overall, it retained the characteristics accepted by consumer as with full-fat margarine⁶. For low-fat

processed cheese spread, addition of 5-6% inulin offers fat-like mouthfeel and enhanced creaminess, as well as good spreadability^{4,8}.



Fig. 1 Colour Appearance of Original Margarine⁶



Fig. 2 Colour Appearance of 40% Inulin Addition into Low-Fat Margarine⁶

Fats out, Fibre In

In addition to inulin acting as a fat replacer in low-fat margarine and spreads, inulin is also used in the development of functional foods due to its beneficial role in gastrointestinal health⁹. Studies suggest that inulin-type fructans had a significant bifidogenic effect and could improve gut microbiota composition². Furthermore, inulin has been shown to improve bowel function through increasing stool weight and softer stools which help relieve constipation¹¹.

Key Takeaways

Heightened health concerns have shaped consumers' food preferences making them more inclined to consume low-fat products in order to maintain a healthy body and lower the risk of various chronic diseases. Hence, the food industry these days are leaning towards the production of low-fat products by using fat replacers. The unique techno-functional

properties of inulin as a fat replacer, make it the better option in developing good-tasting, indulgent low-fat products, with added prebiotic function. At DPO International, we are honoured to be partners with **Beneo Orafiti** to bring you a wide range of ingredient choices that will improve the quality of your oil and fat products.

References

- ¹Alaei, F., Hojjatoleslami, M., & Hashemi Dehkordi, S. (2018). The effect of inulin as a fat substitute on the physicochemical and sensory properties of chicken sausages. *Food Science & Nutrition*, 6(2), 512-519. <https://doi.org/10.1002/fsn3.585>
- ²Birkeland, E., Gharagozlian, S., Birkeland, K., Valeur, J., Måge, I., Rud, I., & Aas, A. (2020). Prebiotic effect of inulin-type fructans on faecal microbiota and short-chain fatty acids in type 2 diabetes: a randomised controlled trial. *European Journal Of Nutrition*, 59(7), 3325-3338. <https://doi.org/10.1007/s00394-020-02282-5>
- ³Food Insight. (2020). Consumer Survey: Purchasing Behaviors, Eating Decisions and Health Perceptions of Dietary Fats and Oils.
- ⁴Giri, A., Kanawjia, S.K. and Singh, M.P. (2017). Effect of Inulin on Physico-Chemical, Sensory, Fatty Acid Profile and Microstructure of Processed Cheese Spread. *Journal of Food Science and Technology*, 54(8), pp.2443-2451. <https://doi.org/10.1007/s13197-017-2686-5>
- ⁵Kangchai, K., Sangsirimongkolying, R., & Methacanon, P. (2016). Feasibility Study of Margarine Substitute Based on Gelatin-oil Emulsion Gel. *Chiang Mai Journal of Science*, 45(1), 505-514.
- ⁶Li, J., Cui, H., Xu, X., Li, J., Lu, M., Guan, X., Zhu, D. and Liu, H. (2022). Effect of Fat Replacement by Inulin on the Physicochemical Properties and Sensory Attributes of Low-Fat Margarine. *Food Hydrocolloids*, 133, pp.107868. <https://doi.org/10.1016/j.foodhyd.2022.107868>
- ⁷Lim, J., Inglett, G. E., Lee, S. (2010). Response to Consumer Demand for Reduced-Fat Foods; Multi-Functional Fat Replacers. *Japan Journal of Food Engineering*, 11(4), 163-168. <https://doi.org/10.11301/jsfe.11.147>

⁸Salijonova, S.D. and Ruziboev, A.T. (2020). Formulation of Low Saturated Margarine for Preventive Nutrition. *International Journal*, 8(7).

⁹Shoaib, M., Shehzad, A., Omar, M., Rakha, A., Raza, H., & Sharif, H. et al. (2016). Inulin: Properties, health benefits and food applications. *Carbohydrate Polymers*, 147, 444-454.
<https://doi.org/10.1016/j.carbpol.2016.04.020>

¹⁰SPX. (2012). Reduced and Low-fat Spreads. Charlotte, North Carolina: Publisher.

¹¹Watson, A. W., Houghton, D., Avery, P. J., Stewart, C., Vaughan, E. E., Meyer, P. D., ... & Brandt, K. (2019). Changes in stool frequency following chicory inulin consumption, and effects on stool consistency, quality of life and composition of gut microbiota. *Food hydrocolloids*, 96, 688-698.
<https://doi.org/10.1016/j.foodhyd.2019.06.006>

¹²WHO International. (2020). Healthy Diet.