

**GLP-1 therapies have sent waves through the food and nutrition industry, creating extensive opportunities for ingredients like prebiotic fibers**

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**Introduction:** It seems like years and countless numbers of worldwide conferences, seminars and symposiums focused on overweight/obesity alongside many “evolving” food pyramids have failed to succeed where GLP-1 therapies seem to have won. People all over the world are adopting GLP-1 therapy, and actually manage to lose weight whereas numerous “promising” “winning diets” have failed. It is believed that in the US already ~ 8% of the population have engaged in some way or another with it. GLP-1 therapy may help reducing body weight by 15-20% especially when routine changes in exercise habits are also introduced. GLP-1 oriented foods are nowadays also promoted by food enterprises. For example, US Chipotle food chain company has introduced a “high protein menu” designed to be “GLP-1 friendly” with options featuring 400-550 calories, 20-40 g protein, and high fiber. In the near future we will probably face more and more companies similar paths.

**However, as in many cases in life we may be in a “no free meal situation” - meaning GLP-1 therapy success may come “with a cost” during, and when it is ceased.** It needs to be emphasized that a smaller plate can make weight loss achievable, however it can be at meaningful nutritional and physiological costs. Fewer calories mean also fewer chances to deliver essential nutrients such as protein, dietary food fibers, good fats, minerals and vitamins. Appetite depression does not necessarily walk side by side with nutritional adequacy. So, aiming to get a better understanding about the complexity related with adoption of GLP-1 therapies let’s briefly understand what is it all about?

**Mechanism of Action of GLP-1 Receptor Agonists, and Nutritional Implications of GLP-1**

**Therapy:** GLP-1 (glucagon-like peptide-1) is a hormone secreted by cells in the distal small intestine and colon in response to nutrients ingestion. GLP-1 stimulates insulin in a glucose-dependent way and suppresses glucagon, promoting a better post-meal glycemic control. GLP-1 can also slow gastric emptying indirectly leading to satiety achievement. Injectable GLP-1 receptor agonists in the market such as semaglutide/Wegovy (by NOVO Nordisk), tirzepatide/Mounjaro, (by Eli Lilly) are widely used for obesity, and type 2 diabetes

treatment. These products mimic the activity of our natural GLP-1 hormone which acts by targeting areas in the brain which are involved in appetite regulation. GLP-1 and these products work by reducing the intensity of hunger feeling, slowing gastric emptying eventually resulting in less calories being consumed. Recently, a pill version of Ozempic (Novo Nordisk) has been approved by FDA which can be taken orally and daily preventing the need for weekly unpleasant shoots. I believe it is reasonable to assume that this version of therapy may enhance further GLP-1 therapy adoption and enlarge its actual market. However, the above if realized may lead to increased exposure of larger populations to certain nutritional deficiencies and risk.

In the last couple of years, many clinicians and nutrition experts have heard the same line from patients on GLP-1 therapy: ***“I don’t think any more about food the way I used to.”*** When GLP-1 therapy starts, the mental chatter around eating goes quiet, portions shrink, snacking fades and the plate gets smaller. People on GLP-1 therapy tend to reduce consumption of processed foods like sugar-containing beverages, confectionary snacks and baked goods. Their commercial success created a consumer movement toward smaller portions, higher protein, and functional foods rich in fiber and micronutrients. ‘GLP-1-friendly’ products now emphasize digestive comfort, and calorie control. It is most probable that the above-mentioned behavioral changes will lead to meaningful long-term effects on the food industry, especially on processed foods, and their related food ingredients markets as well as on future innovations.

Moreover, a major transition is beginning to be observed which seems to be augmented by social media. By that, I mean that ***GLP-1 therapy may be shifting to a kind of a “life-style” trend***, meaning individuals which not necessarily must be medicinally treated with GLP-1 therapy are adopting it for aesthetic reasons. In this case the penetration of GLP-1 therapy may proliferate even further but at the same time not disconnected from its nutritional drawback risks.

**Protein Adequacy and Lean Mass Preservation:** When weight drops quickly, fat loss gets headline, however lean mass is the hidden story. Analyses of GLP-1 therapies show that lean mass can decline in absolute terms as part of total weight loss, even as fat mass falls more. Therefore, protein maintenance should be monitored and proactively protected during GLP-1–assisted weight loss. Advisory on nutritional protein-related priorities for GLP-1 therapy suggests intake of higher protein rates 1.5–2.0 g/kg body weight/day and pairing nutrition with resistance training to preserve muscle. There is another reason protein moves to the front of the plate: it is hard to “catch up” later. If someone spends months eating too little protein while losing weight, rebuilding lean mass after the fact is slower and more effortful. In the GLP-1 era, the best time to protect muscle is while the weight is coming off.

**Prebiotic Dietary Fibers as a Complementary Nutritional Strategy:** What about the fiber prebiotic connection? Eating less food may also result in lower chances to consume adequate daily advised levels of dietary fiber which have been proved to promote general health by lowering the risk of chronic diseases (overweight, CVD, type-2 diabetes) and even provide some protection against colorectal cancer. Moreover. It is also well documented that certain dietary fibers provide protection and health maintenance via their beneficial direct and indirect prebiotic performance.

Individuals on GLP-1 therapy often eat less, feel full sooner, and may experience constipation due to slowed gastric emptying. Prebiotic dietary fibers like those in the inulin-type family which include inulin, sc-FOS (short-chain fructooligosaccharides) and oligofructose have been reported to improve stool regularity, promoting satiety, and have the ability to replace added sugar in food formulations.

For example, sc-FOS, naturally occurring or enzymatically produced from sugar consists of small oligosaccharides (mainly 1-kestose, nystose, and fructosylnystose) have a degree of polymerization of 3-5 units, and a backbone of fructose molecules linked together with a terminal glucose unit. Oligofructose and Inulin have longer chains of polymerized fructose structures. These prebiotic dietary fibers are recognized by most of the worldwide regulatory official authority bodies, and are widely used across the globe. These soluble prebiotic dietary fibers reach the large intestine (colon) intact, and are fermented by beneficial bacterial species like bifidobacteria and lactobacillus to produce short-chain fatty (SCFA) like butyric acid, propionic acid, and acetic. SCFA provide to our bodies a myriad of beneficial outputs including maintenance of our immune system as well as many other direct and indirect attributes. Moreover, SCFA like butyric acid specifically bind to receptors sites like on intestinal L-cells, resulting in their stimulation and secretion to the blood stream of the hormone GLP-1. Human data confirm that inulin-type fructans (including sc-FOS/oligofructose) increase postprandial GLP-1 levels and improve glucose tolerance in adults with overweight or type 2 diabetes. For example, a 2025 randomized controlled trial comparing FOS vs. inulin demonstrated modulation of appetite and glycemic metabolism. Also, a 2025 multi-center symbiotic trial in obese adults further showed improved digestive comfort and appetite control. In conclusion studies confirm that sc-FOS enhances endogenous GLP-1 release via its prebiotic microbiome–SCFA–L-cell signaling.

On top of the above, these group of prebiotic fibers provide only 2 kcal/gr. and may support both calorie reduction and glycemic stability goals for GLP-1 users. From a mode of action view, these prebiotic oligosaccharides complement pharmacologic GLP-1 action by promoting natural, gut-level GLP-1 release via short-chain fatty acid (SCFA) signaling. These prebiotic dietary fibers provide a nutritive mean to assist in GLP-1 oriented nutrition

including potentially easing some undesirable reported side effects. The principle is clear, inulin, sc-FOS and oligofructose need to be added to foods in an amount which is scientifically corroborated to secure the minimal daily doses to assure the existence of an effective prebiotic effect. For instance, in the case of sc-FOS it may be added to foods in an amount which is scientifically corroborated to secure the minimal daily doses to assure the existence of an effective prebiotic effect (in adult humans it is reported to be ~ 2.5 g/day from all nutritive sources). Generally, 2.5-10 g/day total sc-FOS consumption from all sources provide prebiotic and metabolic benefits with good tolerance. sc-FOS, oligofructose and inulin fit well to GLP-1-oriented products: like protein shakes, smoothies, bars.

**Conclusions:** It seems that we are in the doors of an era where science-based medicinal understandings, and directly-related therapies such as GLP-1 are influencing the nutrition industry in a quite impressive manner. GLP-1 receptor agonist therapies represent a paradigm shift in the clinical management of obesity and metabolic disease, and their societal impact extends well beyond clinical settings into consumer behavior and food industry strategy. However, their efficacy in reducing caloric intake must be balanced against the nutritional risks of protein and dietary fiber insufficiency. Inulin-type fructans—inulin, sc-FOS, and oligofructose—offer a scientifically substantiated nutritional tool to complement pharmacological GLP-1 therapy by supporting gut microbiome health, stimulating endogenous GLP-1 secretion via the SCFA-L-cell signaling pathway, improving glycemic stability, and mitigating gastrointestinal side effects. The integration of evidence-based prebiotic fiber strategies into GLP-1-compatible food formulations represents a meaningful opportunity for science-driven innovation at the intersection of clinical nutrition and the food industry. This will probably be translated to a multitude of innovative propositions in the F&B marketplace.