

Gastrointestinal comfort: the combination of positive life habits and a proper supplementation

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In the last two years' period, the pandemic scenario had increasingly boosted customers' interest in gut health. Indeed, they became more and more aware of the interlinkage of their personal digestive health with immunity system, and consequently with general wellbeing too. As a consequence, consumers are now demanding more science-backed products and a clinically-proven solidity.

Since consumers become more educated, and transform their approach to digestive health in a more proactive one, it becomes crucial for supplements' industry to readapt and properly respond to renewed consumers' wishes, in order to ride the way.

Globally, digestive health market in the nutraceutical industry showed an over 42% growth during the last five years. From a regional specific point of view, Europe registered the highest share in term of digestive-related dietary

supplements, showing a nearly 18% portion of the whole sector. USA were on the second step of the podium, with a nearly 15% share, whilst Asia-Pacific region appeared as the tail lamp, with digestive health products accounting for the 6.1% of the total (1).

Latest forecasts on health and nutrition market highlight how "proactive living" trend would be one of the highest interest for the industry. Indeed, around 80% of interviewed consumers worldwide says that is planning to turn their nutritional habits profile into a healthier one in 2021: focusing on European consumers, around 57% of them says they regularly look for different ways to improve their overall health.

Also if lockdown may have led to some unhealthy habits, consumers' focus on preventative health strategies as the key element of this new approach. This all was magnified by the pandemic, with people looking to stay fitter, for longer (2).

Consumers are increasingly recognising that digestive health is a key factor influencing all manner of biological functions—from inflammation and immune function, right through to brain and heart health (3).



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If on one side physicians, dietitians, and nutritionists are pivotal representatives for consumers' education and gut health promotion, on the other side, food supplements brands have to properly claim their products properties, to lead with the science behind what makes their ingredients unique. Furthermore, ingredient-led claims are nowadays a key driver of purchasing behaviour, because people look for multifunctional way to guarantee long-term health.

If compared to the past, consumers' neophobic attitude has been gradually decreasing for some years now, and people are open to try new ingredients, especially if associated with increased efficacy and if belonging to a brand they trust.

Digestive health field seems to be a high potential cluster of the nutraceutical market, with the opportunity to touch different sub-categories, supporting health in different ways. Indeed, digestive system is wide and differentiated, and asks for multifaceted and complementary solutions to be supported with.

Probiotics perfectly suits this market segment due to all their beneficial properties recorded over years. Indeed, probiotics are globally recognized for their positive effects on gut health and digestion, and now research is redefying gut's role as the centre of wellness and well-being. The most important factor when dealing with probiotics is the ability to prove not only their survival in the gastrointestinal tract, but also their ability to adhere, colonize and persist on the intestinal epithelium. These two characteristics are fundamental to prove probiotics long-term beneficial effect even after the end of the administration period. ROELMI HPC has designed and developed several probiotic ingredients aimed at confirming the correlation between gastrointestinal colonization and persistence with long term beneficial effects.

Firstly, a randomized, double blind, placebo controlled clinical trial performed on 150 subjects affected by IBS-constipation (IBS-C), demonstrated after only 10 days the efficacy of SynBalance® SmilinGut 6B CFU/day (*L. plantarum* PBS067, *L. rhamnosus* LRH020 and *B. lactis*

BLO50) and SynBalance® HappyBelly 4B CFU/day (*L. reuteri* PBS072 and *L. acidophilus* PBS066) to colonize the environment and persist after 30 days from last intake, further than reducing IBS-C symptoms quickly and steadily (4). Additionally, probiotics migration from the gastrointestinal tract to proximal district such as vagina was observed: in a very short period of times (14 days + 7 of follow-up), SynBalance® probiotics demonstrated to reach vagina from the gastrointestinal tract, colonize and persist there even in the follow-up period, providing a long term effect in terms of lower pH and improvement of common vaginal discharge (5).

So far, it has been investigated probiotic actions on the gut-skin axis and the implication of gut microbiota in the regression of a skin discomforts: surprisingly the two-month administration of SynBalance® ProBeautyShield (*L. rhamnosus* LRH020, *L. plantarum* PBS067 and *L. reuteri* PBS072) to subjects affected by atopic dermatitis brought to a significant reduction of symptoms, and an overall improvement of skin appearance in terms of hydration and barrier integrity. Also in this case, the positive results observed during the treatment were visible 30 days after last product intake (6).

All these evidences testify SynBalance® probiotics ability to persist in the gastrointestinal tract when administered, and exert long-term beneficial effects.

Digestive health is not only a matter of gut flora, and the proper consolidation of axes between gut and other body districts, such as brain, also passes through integrity and well-being of mucosae. These ones coat and protect the whole gastrointestinal tract, further contributing to nutrients uptake. This both absorptive and secretory specialized epithelium is always in contact with digested food, and further exposed to the external environment at

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oral level, all things that could have harmful effects.

Different factors can lead to mucosal disorders throughout the whole gastrointestinal (GI) tract, affecting life quality. Oral cavity, for example, can undergo aphthous stomatitis, superficial lesions triggered by local trauma, stress, allergy or sensitivity, nutrient deficiency, or microbiome alterations. Further, chronic recurrent oral aphthae can be caused by hard, acidic or salty foods, aggressive oral care cosmetics, alcohol or carbonated drinks.

At a lower GI level, multiple superficial mucosal lesions called peptic ulcers could occur mainly in the fundus of stomach. This stress-related or drug-induced damage of gastric mucosa is due to over-production of peptic acids, which alters mucosal barrier permeability, and turns into inflammatory reactions. Further, acids may go up the oesophagus, leading to acid reflux, generally accompanied by heartburn. This non-erosive reflux disease (NERD) could turn into gastroesophageal reflux disease (GERD), the most serious form of acid reflux. Excessive alcohol use, chronic vomiting, stress, NSAIDs, bile reflux and *Helicobacter pylori* infection can

exacerbate this condition and lead to gastritis.

Corticosteroids, antiseptic/anti-inflammatory agents, proton pump inhibitors and gastro-protective agents are some of the commonly used treatments to relieve from discomforts, treating symptoms without specifically addressing leading causes.

Due to their pivotal role in preserving the integrity

of epithelium, its functional hydration and biological equilibrium, hyaluronans (HAs) are essential molecules for mucosal well-being. Indeed, HAs are largely used since trigger cell adhesion, proliferation and migration, regulate vascular endothelial cell function and maintain extra-cellular matrix resilience and tissue moisturization. Further, they sustain wound healing and re-epithelization processes, promoting fibroblast activities, vascularization and collagen deposition in healing mucosae. Signalling properties of different molecular weights HAs are the key element for the efficacy of all the above-mentioned biological effects. Indeed, through the interaction between HAs and specific receptors (such as CD44), different polymer sizes upregulate specific cellular pathways: for this reason, it is important to protect and support the innate and ever-changing hyaluronan pattern of human mucosae.

Thanks to years of scientific research, and trying to release the effective solution to support mucosal health through a biological-like stimulation, ROELMI HPC released ExceptionHYAL® Relief, a full spectrum of hyaluronans for the promotion of gastrointestinal epithelium integrity, and wellbeing. The innovation beard by ExceptionHYAL® product, featured by the 2.0 generation hyaluronans, lays in the complete spectrum of HAs molecular weight, which mimics what naturally occurs in human tissues. In-vitro evidences of augmented cell proliferation,

together with the enhancement of protein and elastin neo-synthesis, preliminarily evidenced the potential of ExceptionHYAL® Relief, which later resulted in *ex-vivo* evidences of an efficient and steady moisturization of oral mucosa, the improved wound healing performance, a decreased tissue permeability and strengthened barrier effect.

ExceptionHYAL® Relief allows the regulation of the different specific effects of diverse HA MWs, implementing a *rheostatic* control over biological processes. It is more sensitive and efficient than a simple ON-OFF-like switch for cells biology control, typically induced by standard marketed hyaluronans.

This regulatory mechanism allows the cell to react in a more sensitive, fine-tuned manner, thus opening a subtler range of physiological responses. All this leads to the enhancement of cellular processes, improving tissues regeneration, hydration and barrier effect, further contributing to injury healing and inflamed tissues soothing, reducing recurrences thanks to the promotion of mucosal barrier effect. The great potential of ExceptionHYAL® Relief is now being assessed in an ongoing human trial for intimate mucosae well-being, evaluating its ability in supporting vaginal atrophy.

Then specific probiotics and second-generation hyaluronans represent good tools from biotechnology, addressed to gut health nutraceutical industry, whose great versatility and multifunctional clinical efficacy perfectly meet customer's demand and its new normal, promoting proactive living for overall health.

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