



THE WINNING FORMULA IN PERSONALIZED NUTRITION

By Tobias Mahnke, Christian Hoffmann, and Benjamin Subei

IMAGINE A RUNNER WHIPPING up a morning smoothie with supplements customized to their specific metabolism that help them hit peak performance during a race. Or someone with a chronic illness preparing a meal with the exact nutrients necessary to keep the condition from getting worse.

The ability to produce such highly customized nutritional compounds may sound futuristic, but it is becoming more commonplace. As it does, it is creating a market for the ingredients, devices, and services related to these products that new and existing companies are eager to jump into.

Startups have been the front-runners in this budding business, attracting venture capital to fund their efforts. But existing industry players are well-positioned to make an impact, including chemical companies that have long supplied ingredients for packaged foods and nutritional products.

Food ingredient suppliers have the scientific know-how, financial means, and existing

partner ecosystems needed to win in this emerging industry. But to succeed, they must approach it as a new business. They need to move beyond simply supplying products and use their experience and expertise to expand into new services, such as providing diagnostics and data-enabled recommendations. Because such businesses may fall outside their core competencies, these companies should consider expanding through mergers, acquisitions, corporate ventures, or partnerships.

A Market Poised for Takeoff

The food industry has long sold products tailored to the tastes and preferences of specific consumer groups, such as power bars for athletes. Personalized nutrition takes that a step further, with companies selling dietary compounds and related substances that are tailored to the circumstances or needs of much smaller groups, and even to specific individuals. Those needs can be determined remotely using tests completed on devices such as smartphones, smart watches, and fitness trackers or

through in-person medical exams using blood, microbiome, or DNA tests.

The industry uses the term “personalized nutrition” to mean anything from semi-customized products for specific groups, such as long-distance runners or people with a specific chronic disease, to fully customized supplements for a single person.

The current market for personalized nutrition is relatively small. We estimate that global sales were less than \$2.5 billion in 2019. That figure should increase exponentially as the world’s population ages and consumer interest in health and wellness continues to grow, as does the broader trend toward personalization.

The personalized-nutrition market extends beyond the ingredients needed to create individually tailored nutritional compounds to include customized nutrient delivery systems and related services. It also includes the development of diagnostic tools and tests, data analytics methods, and research and development work to find new biomarkers that indicate a person’s health or nutritional needs and to identify the nutritional products that would fit those needs. Growth should also get a boost from the rise of direct-to-consumer business models, digitization and other technological advancements, and venture capital investments in the industry.

Niche and Regional Growth

We believe that sports and medical nutrition and dietary supplements, including supplements for older people, have the most potential for growth. Use of technology, devices, and data is widespread in those markets, and consumers already perceive benefits from the products. Consumers in these product categories have also shown a willingness to pay—evidenced by the fast rise in popularity of fitness trackers.

The most promising geographic markets for new personalized nutrition products are the US, China, and Japan. In the US, a vibrant startup scene and active venture capital investors have led to widespread

innovation in food technology, and US consumers are generally eager to use the industry’s new offerings. Rising incomes in China and the fast integration of digital into all aspects of daily life there make it an attractive market. The country’s more lenient data-protection policies also support fast adoption, as companies face fewer hurdles to implementation. In Japan, a tech-savvy consumer base and large number of aging people offer strong opportunities for growth. By contrast, Europe is likely to be a market laggard because of more stringent data-protection policies. The region has a history of adopting innovations that originate in the US rather than of spawning trends in the industry.

To date, the personalized-nutrition market has been dominated by startups and fast-moving consumer goods (FMCG) companies that are experimenting with various technologies and products. One such startup, Habit, sells personalized nutrition plans that are based on a person’s cholesterol, activity levels, personal wellness goals, and other information they provide through a questionnaire. Segterra’s InsideTracker platform offers a personalized nutrition and fitness plan that’s based on blood testing, DNA, and lifestyle habits. Another startup, Viome, analyzes a person’s gut microbiome in order to create an individualized nutrition plan.

Established niche companies are also entering the personalized-nutrition arena. One is MyMuesli, a Germany food company that uses mass customization to let customers create individualized cereal mixes. The company launched blood and DNA tests that individuals can use to tailor muesli mixes to their specific macro- and micronutrient needs as a way to counter potential nutritional deficiencies.

Opportunities in the market have also drawn the attention of large FMCG companies. Nestlé launched a “Wellness Ambassador” project in Japan that uses artificial intelligence, DNA testing, and meal analysis to create food products that meet the needs of individual consumers.

The Profit Margin Sweet Spot

Our research shows that delivery costs and the price people are willing to pay are directly related to a product's level of customization. (See Exhibit 1.) Less customized products cost less, but people are less willing to pay a lot for them. Customers are substantially more willing to pay for highly customized products, but there is a limit to this willingness: at a certain point the cost of delivering those products exceeds the price that companies can charge.

We believe ingredient suppliers will realize the most value—as measured by profit margin—by focusing on semicustomized products, which strike a balance between the higher prices people will pay for customization and the lower delivery costs of products that are not fully customized. For example, suppliers could derive more value by selling a dietary supplement for runners with premixed portions of vitamins, trace minerals, and other nutrients than they would by creating mixes that are 100% customized for specific individuals.

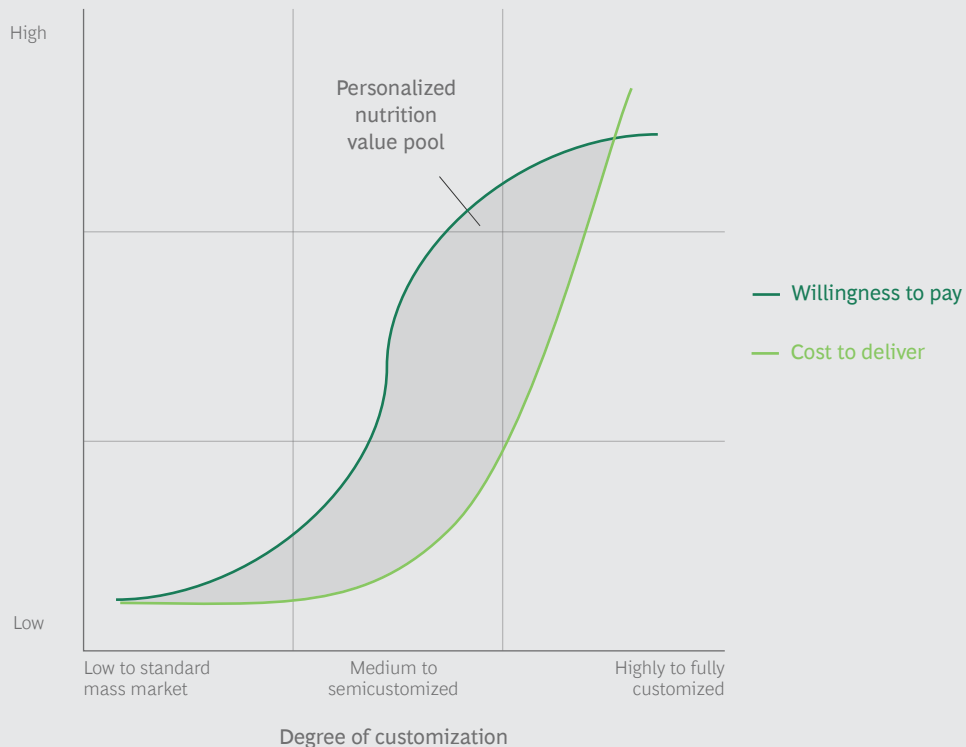
Expanding the Value Chain

Traditionally, food ingredient companies have supplied raw ingredients to food manufacturers, which distribute products to retail outlets to sell to consumers. To expand into selling personalized nutrition products, these companies need to add new steps to the beginning of that value chain: data collection, and data analytics and recommendations. (See Exhibit 2.)

In the first new step, companies collect consumers' health information or nutritional status through tests or devices. In the second new step, they interpret the data to come up with recommendations for ingredient blends based on consumers' nutritional needs.

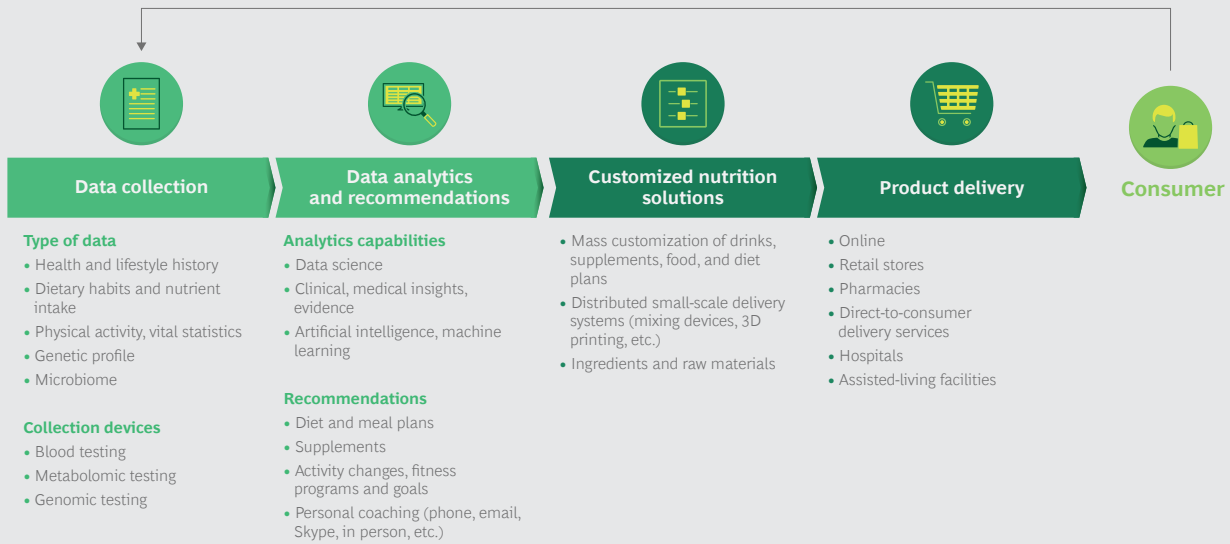
After that, an ingredient supplier could create ingredient blends involving powders or liquids that don't require further processing. An FMCG company could do that work for ingredient blends for liquids or more complex food products. In either case, the final step involves delivering products to

EXHIBIT 1 | Product Customization Affects Delivery Costs and Willingness to Pay



Source: BCG analysis.

EXHIBIT 2 | Selling Personalized Nutrition Requires Expanding the Value Chain



Source: BCG analysis

the consumer through direct-to-consumer or traditional retail channels.

To expand the existing value chain, personalized-nutrition providers need the following:

- Access to consumers and diagnostic technology such as smart devices with remote sensors or devices for blood or microbiome testing that's needed to collect data from them
- Scientifically proven analytics, to parse data collected from diagnostics and use it to customize nutrition recommendations
- More flexible operations, to allow for the higher product variability and smaller volumes that manufacturing customized products requires

Given the current gaps in ingredient suppliers' capabilities, it's difficult to forecast exactly what role they will play in this evolving value chain. However, other potential players in the business such as major FMCG companies face similar challenges, which gives ingredient suppliers a fair shot at gaining relevance and market share.

A handful of food ingredient suppliers have made early moves into the personalized-nutrition market, including several that entered the business through partnerships with technology startups. Among them are German chemical company BASF, which formed separate partnerships with Segterra and consumer health care company Xerion Limited; and DSM, the Dutch science company, which struck a deal with digital health company Mixfit to deliver personalized nutrition solutions.

How Food Ingredient Suppliers Can Compete

While food ingredient suppliers may lack capabilities in certain areas, their existing business and experience does make them well-situated to exploit specific market opportunities. If companies are considering entering the market, they should focus on the following:

Providing testing. Large suppliers have the expertise, scientific know-how, and financial resources to conduct the scientific studies needed to support the health claims of the ingredients they sell. If suppliers can formulate these scientific proofs, they could gain a competitive advantage over startups and small FMCG

players that lack the same knowledge or resources.

Offering better data. Sensors, test kits, and other diagnostic devices already exist for collecting and analyzing personal nutrition data. But the current generation of technology can't deliver data with the level of precision and accuracy needed to reap personalized nutrition's full benefits. Food ingredient suppliers could use this shortcoming to generate additional revenue by developing improved testing methodologies, including better biomarkers, or by providing related testing services.

Forging partnerships. Ingredient makers must strengthen their existing scientific expertise in order to provide needed data-generation technologies, data science,

and computational bioscience. To build these capabilities, companies will need to grow organically or through mergers, acquisitions, joint ventures, and other types of partnerships. They could also consider creating a corporate-funded startup or spinning off a personalized-nutrition business. That could make it easier for the new entity to partner with outside parties than if it were run by the same line organization that manages the company's existing nutrient or food ingredient business.

THE FOOD INDUSTRY is ready to dish up new personalized nutrition products, offering ingredient suppliers an opportunity to expand. But suppliers must formulate their approach to this market quickly or they'll miss their place at the table.

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