


Personalized Nutrition

Finding the right
Business Model
to overcome the
Valley of Death 

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By Clément Tischer, Charlotte Dyba, Nard Clabbers, Mariette Abrahams (PhD),
Kerstin Burseg (PhD), Dr. Georg Schirmacher, Simone Frey (PhD)

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If you have any questions that are not covered in this paper, do not hesitate to approach us!



Clément Tischer
NX-Food

Head of Innovation & Partnerships
clement.tischer@nx-food.com



Charlotte Dyba
NX-Food

Expert - Food, Methods & Innovation
charlotte.dyba@nx-food.com

Partners



Key Insights

Personalizing products and services has successfully been established across various industries (e.g. video streaming & sneakers) and has experienced significant growth within the last years.

The Personalized Nutrition (PN) industry topped \$8.1 billion in 2020 and should more than double to \$19.7 billion by 2027.

There are four major trends that drive the PN industry:

Scientific developments such as the understanding that no one diet fits all, a better knowledge of the gut microbiome and the insight that genetics only explain a small portion of an individual's response to foods.

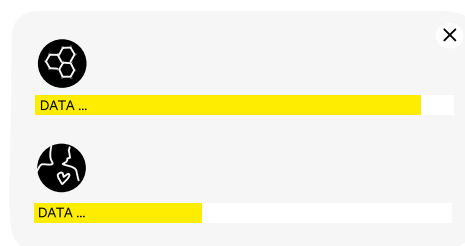
Technological advances with data collection e.g. wearables or blood testing kits for at home resulting in more data that can be analyzed.

Socio-economic shifts meaning that consumers increasingly focus on health and wellness improvement and are empowered by better access to knowledge.

Growth of personalized experiences in general which add value for consumers but also raise the expectation to be treated individually.

The nascent PN industry has some very specific challenges that have likely so far prevented it from reaching a mass market.

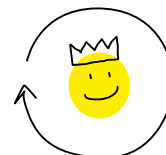
To deliver PN products and services, firms need a significant amount of individuals' health data.



Collecting, storing, analyzing, and transforming data into a personalized consumer product on a mass scale carries a number of costs which likely result in a higher price for PN products. However, a higher price might raise consumer expectations regarding achievable results.

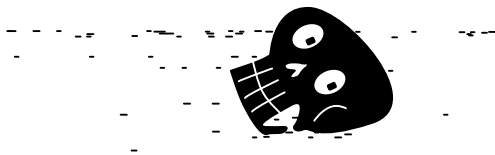
To achieve positive health outcomes, consumers need to invest their own time and resources into using PN products. Keeping the consumer motivated and engaged long enough to deliver a tangible outcome will be a top activity associated with marketing any PN product or service.

The emerging personalized nutrition industry operates at the intersection between food, health, medicine, technology, and science. As such, the value chain is significantly fragmented and complex.



It starts with the consumer's personal information and data and ends in the health impact on the consumer which can again be seen as the next starting point for data collection. Thus, the value chain is circular with the consumer firmly planted at its center.

Despite the strong industry outlook which is signaling a huge potential for PN, no single firm seems to have a truly holistic approach to the PN market yet, where PN concepts include all the complex steps of the value chain, moving beyond niche supplements and recommendations, and reaching a mass market. This suggests that attempts at innovation in Personalized Nutrition have reached the “Valley of Death.” Meaning they have failed to develop a business model for personalized food products that will sustainably generate revenue throughout the entire customer journey.



We suggest four high-level business model opportunities that can help moving Personalized Nutrition concepts from niche to mass market thus escaping the Valley of Death:

- 1 Personalized eGrocery
- 2 Gastronomy
- 3 Personalized Nutrition Platform
- 4 Subscription-based, personalized Meal Service

Ultimately, we believe the industry will either thrive or fail based on two key factors.

First, no matter what business model is followed, a completely connected platform and a nutrition profile standard are needed to create a perfect value chain.

Secondly, and possibly most importantly, it's essential to retain the emotional aspect of food as customers mostly eat to enjoy the sensations food can bring.

Introduction

We live in an unprecedented age where both consumers and businesses have access to more information and data about their nutrition than ever before. On one end, consumers have apps to find a product's nutrition information and nutritional score, to track calories, and to monitor their health. Consumers are generally more knowledgeable about what they eat and drink, possibly more than any other time in human history. On the other end, businesses can gather far more data about consumer behaviors and choices, giving them sharper insights into consumers' interests, preferences, beliefs and desires.

Consumers are also faced with far more food options than ever before. Vegetarian, vegan, gluten-free, sugar-free, carb-free, ketogenic, etc.—they are looking for ways to match their diet to their lifestyles and values. As a result, food is becoming more personalized.

PN

For at least the past two years, CPG brands have been diving into Personalized Nutrition as a way to deliver more individualized products to customers. Now a movement more than a trend, the Personalized Nutrition industry topped \$8.1 billion in 2020 and should more than double to \$19.7 billion by 2027.¹ Some analysts project the PN industry to reach more than \$64 billion by 2040.² Such a market valuation speaks as much to the nascent potential of PN as it does to the fact that delivering personalized food products on a mass scale is required to reach these projections.

No single firm seems to have a truly holistic approach to the PN market yet, where PN concepts include all the complex steps of the value chain, moving beyond niche supplements and reaching a mass market. This suggests that attempts at innovation in personalized nutrition have reached the "Valley of Death," meaning they have failed to develop a business model for personalized food products that will sustainably generate revenue throughout the entire customer journey. To successfully capitalize on this shift in consumer demand, it's important to understand some of the factors that have prevented the PN market from reaching its full potential to date. It also requires an innovative business strategy to overcome the challenge.

This whitepaper explores both the underlying drivers of the personalized nutrition movement as well as some business models that we believe will help brands pass the Valley of Death and move PN from niche to mass market.

We will start off by creating common ground with some PN fundamentals.



1. CB Insights 2021

2. UBS 2020

Understanding Personalized Nutrition from the Ground Up

What is Personalized Nutrition?

Before we discuss strategies for developing sustainable business models for delivering PN products or services, let's take a moment to create a common understanding about the term. For the purposes of this white paper, we define PN as using data consisting of individual characteristics to develop targeted nutritional advice, products, or services. This means that PN is tailored to the individual needs of a single person with the objective to achieve a lasting beneficial improvement in health and/or reach personal goals.³

From a business standpoint, we can gather a number of data points about customers that can form the basis for developing personalized food products.

It's no secret that everyone's body is different in terms of how it processes and reacts to food. Additionally, individuals also differ in terms of their composition of gut bacteria, known as the microbiome. The microbiome is responsible for a number of biological functions, including extracting nutrients and managing the immune system.⁴ The more we learn about how the microbiome works, the more we have been able to pinpoint appropriate dietary recommendations

along with a variety of food-related issues, such as food intolerances and allergies.

Additionally, PN takes into account other biological factors, such as height, weight, metabolism, biomarkers, and others. Of course, some of these factors change over time in response to nutrition, exercise and other lifestyle choices, and they are an important piece of information for delivering PN.



Biological Data^{5,6}

- Physical measurements (height, weight, waist circumference, etc.)
- Metabolism biomarkers from blood, saliva, urine
- Gut microbiome genotype

To that end, PN also considers customers' behaviors, food choices, nutrition intake, ethnic and cultural background, and general lifestyle. To achieve lasting benefits, PN analyzes all these factors and data points to deliver products or services that seamlessly integrate into the customers' daily life.



Personal Data^{5,6}

- Behavior
- Psychological traits
- Ethnic and cultural background
- Lifestyle
- Food choices
- Nutrient Intake

3. Bush, et al., 2020

4. Berry, et al. 2020

5. Kolossa 2017

6. Celis-Morales, et al. 2015

But what is driving consumers and business to invest more time, money and effort into applying data analytics to our expanding knowledge of human biology and to translate it into viable businesses?

Business Drivers of Personalized Nutrition

When it comes to translating personalization to food products and services, there are three main categories of drivers: science, technology and socio-economy. Additionally, the megatrend of personalization across industries facilitates the acceleration of the PN industry as well. Let's take a look at each to understand how they can inform a successful PN business model.

Scientific Drivers

Datatype:



Our improving knowledge and understanding of the human microbiome has opened the doors to new possibilities of personalized nutrition products and services. Specifically, research has shown that there are strong links between gut microbes and our individual metabolic responses to food.⁷ Thus, what we eat changes our microbiome, which in turn affects our physiology and health. What's more, the human microbiome varies widely from person to person, meaning that food and diet can have individualized effects. This has led to the recognition that, in terms of nutrition, no one size fits all.

Previously, it was assumed that our genetic makeup dictates our responses to food. However, we are no longer prisoners of our genes. Research has shown that only a small portion of an individual's response to various foods can be explained by genetics.⁸ Indeed, this assumption has had a major influence over how consumers understand personalized nutrition, and is often

reinforced by companies offering nutrition based on DNA tests.

Technological Drivers

Datatype:



Like all industries, advances in technology, data collection, and data analytics have dramatically changed the health and wellness industry. Indeed, many new products and services have been made possible thanks to new digital technologies, and personalized nutrition is no exception.

Fueled by consumer technologies that range from in-home DNA testing kits to wearable technologies that monitor health and fitness metrics, the "quantified self" movement has put personal medical and health information at the fingertips of average consumers. Tracking heart rate, steps, sleep patterns, and other metrics, quantified self-technologies have allowed individuals to gain new insights into how their lifestyle impacts their health. Indeed, approximately 75 percent of people who track their health metrics say the act of tracking improves their own behaviors at least moderately.⁹

That said, data tracking can get tricky. While some biological data can be automatically collected using wearables (heart rate, active minutes, etc.), many of those technologies rely on self-reporting, and customers may or may not report accurately or be disciplined enough to gather sufficient data. Nutrition trackers, for example, require users to enter what foods they ate and the portion size. However, most users won't take the extra step to measure every single item they eat. Biological data is slightly easier to gather, relying on tests that often can be conducted at home.

To successfully deploy a PN product or service, there need to be motivational reminders and clear instructions for users to enter their data.

7. Berry et al., 2020

8. Matusheski, et al. 2021

9. Deloitte 2021

Health and wellness as a category certainly have a long history in consumer culture. Since the days of snake oil salesmen pushing fake panaceas to the boom of Peloton fitness bikes today, consumers have always been willing to pay for products and services they believe will make them healthier. In fact, 79 percent of consumers today say they believe wellness is important to them. And they're clearly spending money on it; the global health and wellness market is estimated to be worth \$1.5 trillion with annual growth between five and 10 percent each year.¹⁰

A significant part of this growth is due to better access to health-related information online. By one estimate, there are more than 70,000 websites that offer health information.¹¹ From consumer-focused health websites to academic and clinical research to government agencies to casual health and lifestyle bloggers, there is a nearly infinite amount of information and opinions online. Of course, not all sources are accurate or science-based, nor should their advice always be followed (unfortunately, there are plenty of hucksters selling fake cures online). Ultimately, this has created a culture of knowledge, where consumers can proactively look for relevant and timely health information but need to take a reflected approach towards validity of information.

This increased access to information has empowered consumers to take a more proactive role in managing their own health. And an important part of that easily available knowledge is the increasing interest in food as medicine. Whether it's looking for foods that are high in anti-oxidants to reduce the risk of heart disease or eating more high-fiber leafy green vegetables to reduce inflammation, consumers are looking to

improve their overall health and manage chronic health conditions using food.^{9,10}

Growth of Personalized Experiences

Personalization as a business strategy isn't new, but it is still novel when it comes to developing mass marketed food products or services. In fact, in the digital age, a majority of consumers have come to expect personalized experiences in nearly every aspect of their lives. Services like Netflix, online advertising, news websites, search engines, on-demand products, and retail shopping have all developed systems to collect and analyze user data, and then deliver personalized experiences.

And it pays off. An overwhelming majority of firms that pursue personalization strategies see significant revenue growth. One survey of retail, hospitality, travel, and insurance firms found that 77 percent of businesses that surpassed revenue goals had a personalization strategy in place, while 74 percent of them dedicated budget towards personalization.¹⁴ Ultimately, personalized experiences add value for consumers, and they're often willing to pay more for higher levels of personalization.

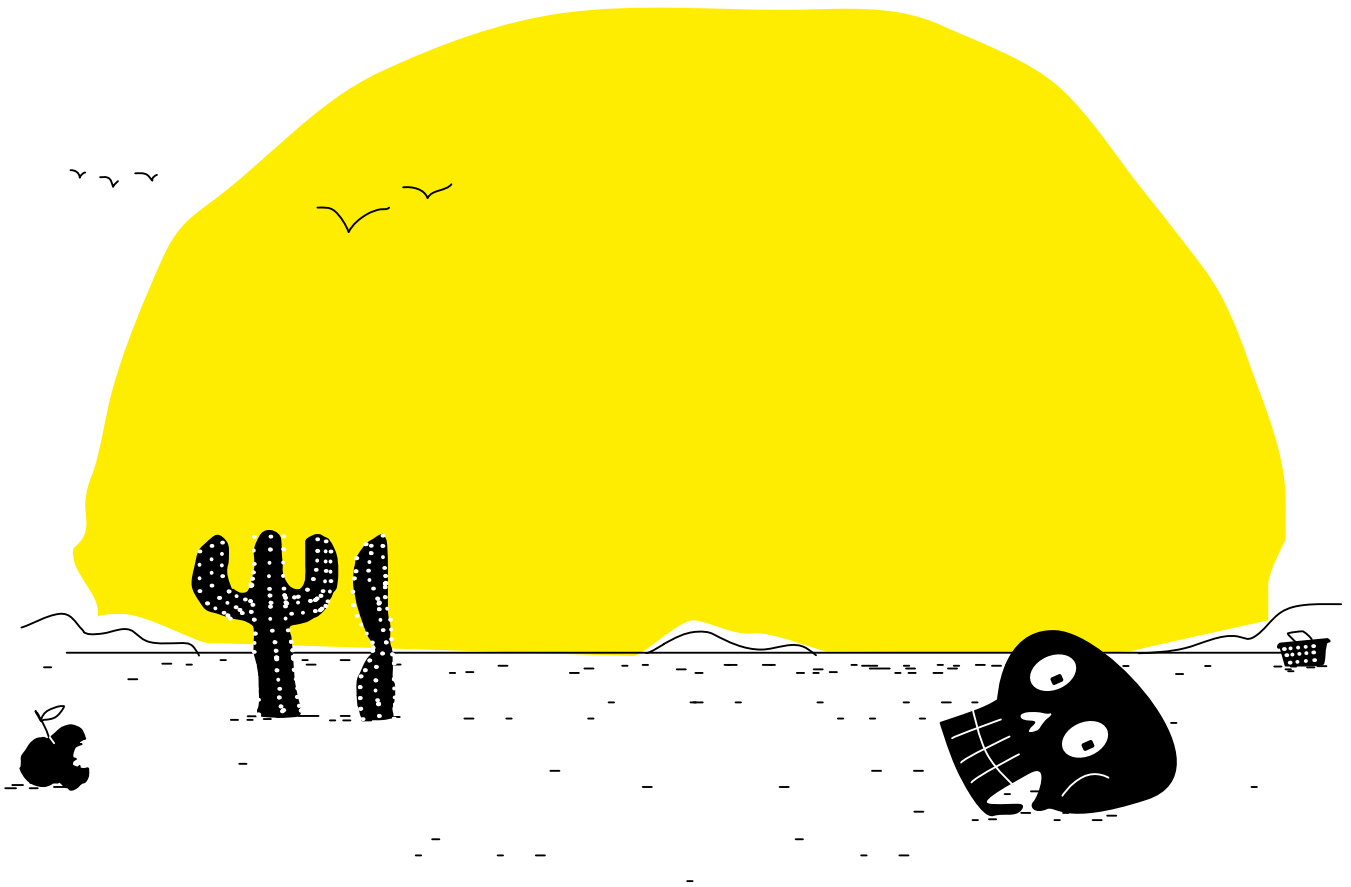
Research shows that in general, consumers often have a positive attitude towards personalized nutrition based on biological evidence. Ultimately, the freedom to enhance or maintain their health makes consumers feel empowered and knowledgeable.¹⁵

If all of these health and wellness trends point to a potential demand for more PN, why hasn't the industry exploded as quickly as other data-driven health sectors? Enter the Valley of Death.



10. Callaghan, et al. 2021
11. Sbaifi and Rowley 2017
12. Nutri-Facts 2011
13. Hunter 2021
14. O'Shea 2019
15. Ahlgren 2013

The Valley of Death



The Valley of Death describes the phase in a startup's lifecycle where it has received funding and is operating, but it is not yet generating revenues.¹⁶ Coined by venture capitalists, it is a common phase that nearly every new venture must pass through before becoming profitable. It's also the period in which many early-stage ventures fail. And while the term refers mostly to startups, innovation labs at top brands and manufacturers also must contend with the Valley of Death when developing new products and services, including those in the personalized nutrition category.

Indeed, the nascent PN industry has some very specific challenges that have likely so far prevented it from reaching a mass market. Developing a sustainable business model that connects the dots between all of these health and technology trends, delivering personalized food

products and services remains the core obstacle for many established companies and startups alike.

Challenges to Personalized Nutrition Business Models

Interestingly, many of these challenges stem from how personalized nutrition is formulated to begin with. That is, to deliver PN products and services, firms need a significant amount of individuals' health data. Collecting, storing, analyzing, and transforming data into a personalized consumer product on a mass scale carries a number of costs and ramifications for both businesses and their customers. Let's take a closer look at each of these ramifications impacting the viability of PN products and services.

¹⁶. Fernando 2021



As mentioned, PN requires enough high-quality data in order to deliver on its promise of better health outcomes through nutrition. And while data warehousing itself is not expensive, collecting, managing, and analyzing it requires a sophisticated infrastructure, which itself demands significant time and resources to build. What's more, this infrastructure likely needs to be developed in the pre-revenue stage, and can account for a significant sunk cost.

High Costs Leads to Higher Prices

The more complex a firm's infrastructure needs are, the higher the cost for its product or service is going to be. And while consumers are prepared to pay a certain premium for personalized products and services, the costs for personalized nutrition likely still pose a significant barrier for many consumers, potentially limiting a firm's ability to reach a mass market. What's more, the higher cost of PN products or services will raise consumer expectations; should these not be met, it will be very difficult to earn consumers' trust and loyalty in the long term. Lastly, higher costs needed to develop and manage a PN product or service can possibly result in lower profit margins, making them less appealing to businesses looking to enter the market.

Consumer Expectations

The digital age has made consumers far more wary about how their data is collected, used, and shared. Of course, PN requires consumers to share extremely personal information, and consumers are generally willing to trade off sharing "basic" personal information in exchange for more personalized experiences.

When it comes to health information specifically, though, consumers are far more private, with less than 20 percent saying firms should "give or sell information to other organizations to improve healthcare outcomes."¹⁷

Data privacy considerations aside, there may be a steep learning curve for consumers when it comes to PN products and services. Some consumers may have a superficial understanding of what personalized nutrition is, depending on their knowledge and use of personalization in other products and services they patronize. It's possible that some consumers who do not fully understand PN's value proposition will ultimately find themselves disappointed when the expected benefits aren't obvious or delivered quickly. However, consumers may expect rapid—even unrealistic—results, given the speed at which advanced, digital technologies often deliver outcomes. For example, consumers can quickly and easily see the impact of a regime change on heart rate and weight when using health trackers. This type of positive, reinforcing feedback must be built into any PN product, where microbiome, micronutrient levels, or other health parameters in blood and things like "energy" or "sleep" are measurable and can change quickly.

Lastly, the more data consumers deliver, the higher their expectations are for tangible results. These expectations, however, may be unrealistic. Of course, there are many factors that contribute to a person's health, and while food is one of the top factors, it certainly isn't the only factor. What's more, even when consumers know that healthy choices lead to better health outcomes, other factors often come into play such as price, knowledge, and time.¹⁸ Consumers need things to be clear and simple, a particular challenge for business models that requires significant consumer participation.

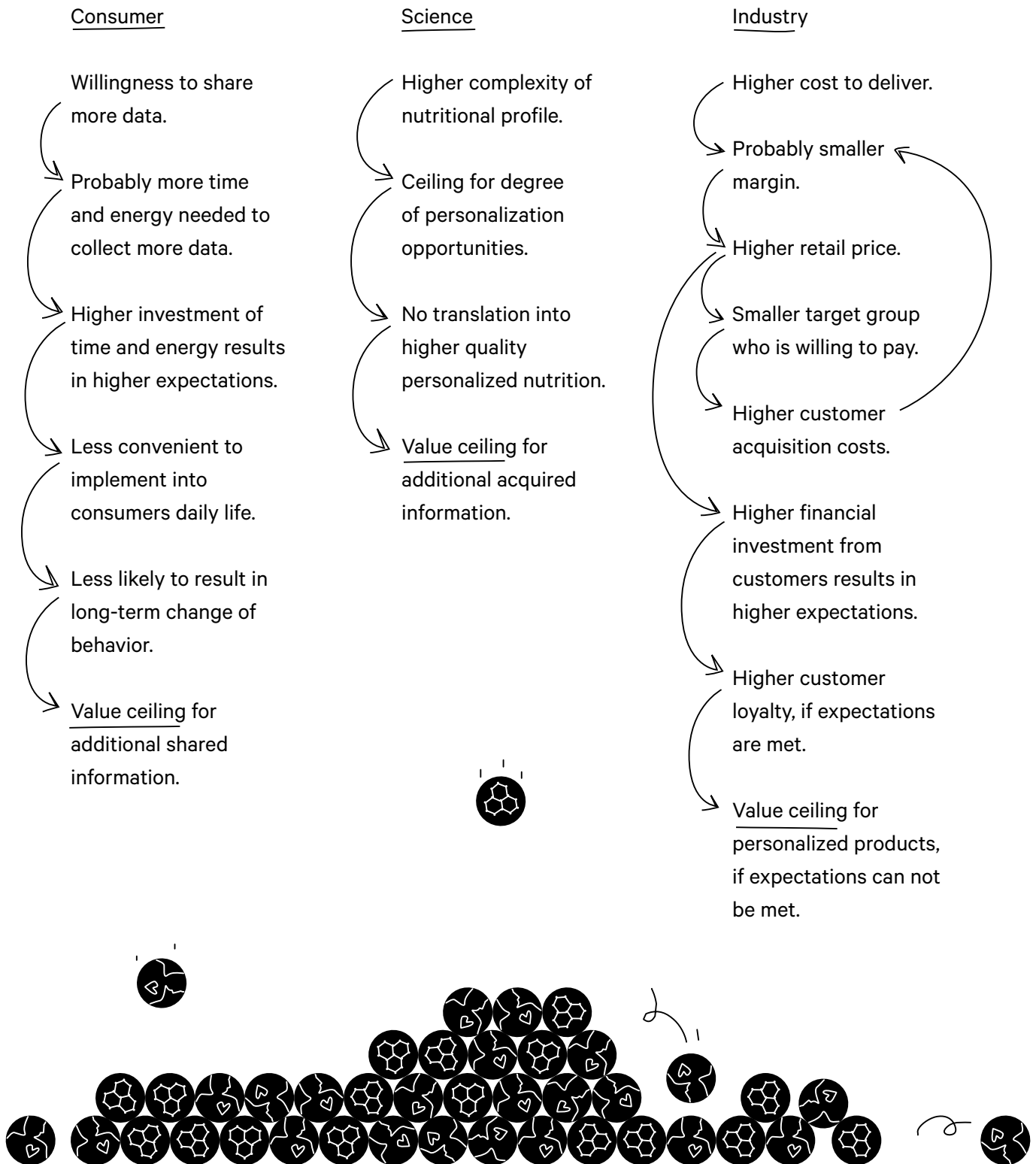
17. Brown, 2020

18. Brown, 2020

Unclear Value

To achieve positive health outcomes, consumers need to invest their own time and resources into using PN products. This may require significant behavior change and present challenges similar to prescription medication adherence; i.e. outcomes

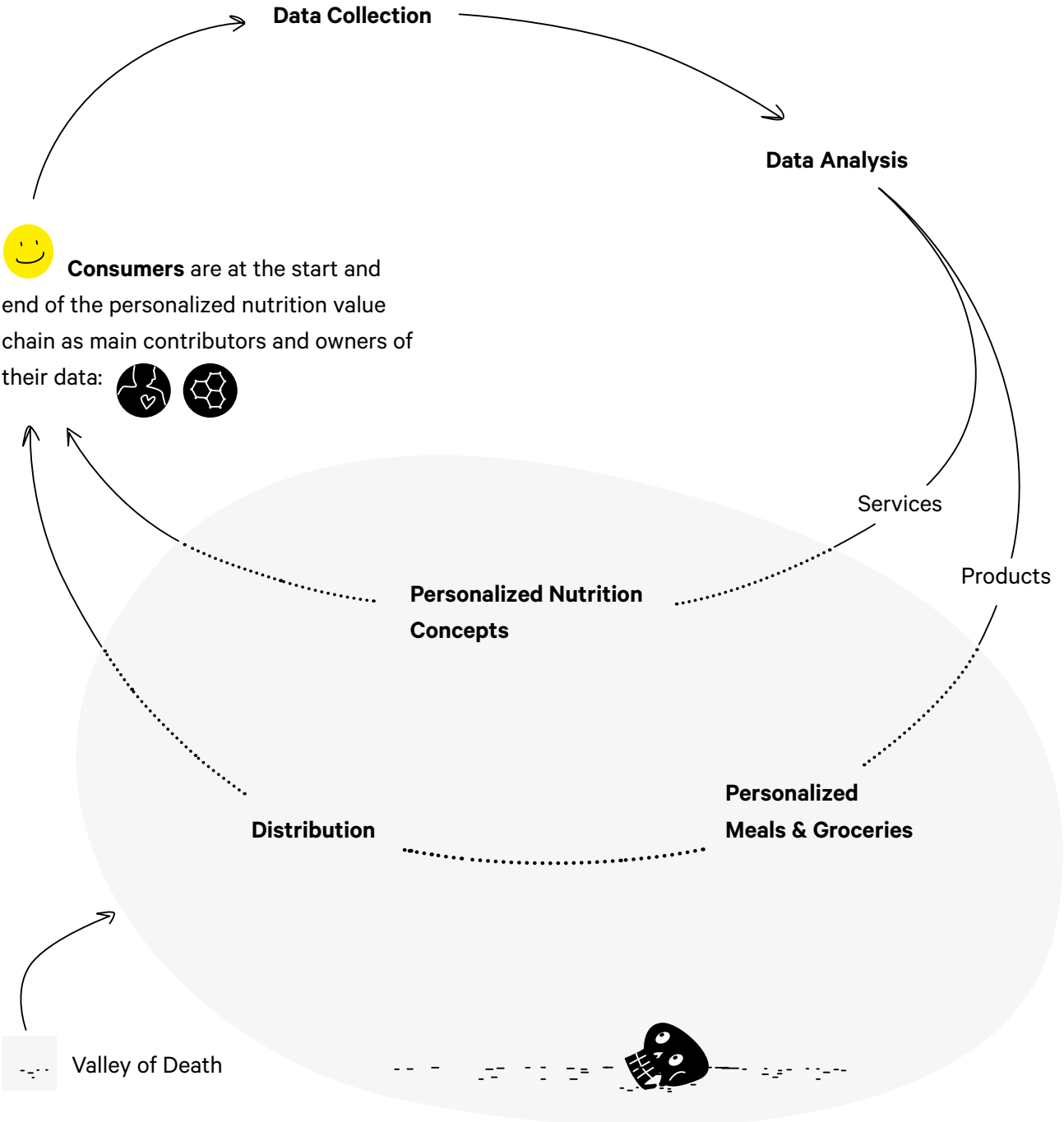
will be diminished if the consumer does not follow a particular PN regime. Keeping the consumer motivated and engaged long enough to deliver a tangible outcome will be a top activity associated with marketing any PN product or service. The challenge, though, is that consumers may or may not see value in changing their behavior.



The Value Chain of Personalized Nutrition

The value chain of personalized nutrition differs significantly from standard products or services, with the main difference being that it both starts and ends with consumers. It starts with the consumer's personal information and data and ends in the health impact on the consumer. Thus, the value chain is circular with the consumer firmly planted at its center. Optimally, consumers will collect their own data throughout the process in

order to evaluate the results of personalized nutrition. This step needs to be integrated into the value chain to make the impact of personalized nutrition measurable and tangible. Only by ensuring this behavior is maintained consumers come to experience PN's positive impact and make long-term behavioral and/or lifestyle changes. This is a key aspect to developing a sustainable business model, where the product itself is iterative and can be altered over time to better match each individual. In this sense, the end of the value chain also serves as the starting point of data collection.



Personalized Nutrition

Stakeholders

The emerging personalized nutrition industry operates at the intersection between food, health, medicine, technology, and science. As such, the value chain is significantly fragmented and complex. Furthermore, technology and macro socio-economic megatrends make the industry landscape highly dynamic, constantly evolving and changing.

As of today, the entire PN industry is made up of approximately 500 companies, of whom most are start-ups based in the United States, with Europe a close second and Asia a rapidly emerging third. The dietary preferences and nutritional supplement segments lead the industry by far in terms of the number of start-ups with the microbiome segment one of the fastest growing. Most PN companies are even less than 10 years old.¹⁹

For a comprehensive overview on current personalised nutrition solutions in the market visit



qina.tech

Consumers are at the start and end of the personalized nutrition value chain as main contributors and owners of their data.



Industry players are another key stakeholder group positioned along the value chain:

- **Companies focusing on data collection** (medical & consumer) or **data analytics** transforming the data into nutritional information and individual profiles
- **Retailers**
- **FMCG**
- **Hospitality**
- **Food logistics**
- **Insurance**



Healthcare professionals, from doctors to nutritionists, dietitians and health coaches support end-users to implement the dietary and lifestyle recommendations provided.



Academia plays an important role not only in pushing further research to generate more knowledge about nutrition but also in the creation of personalized nutrition spin-offs.



Regulatory stakeholders (governments) ensure that devices, services and tools are safe for public consumption.

¹⁹. Qina 2021

Connecting all the dots

Because the value chain is so complex, personalized nutrition requires a number of steps and processes in order to be successful, and each step must be part of a fully integrated system. This complexity makes it difficult for a single industry player to execute all the steps and processes in the value chain because different expertise is needed at each stage.

The value chain will also vary depending on whether a firm is offering a product or a service/ advice, each with its own unique strengths and weaknesses.

For products, the value chain relies on automated data processing to produce personalized products that can be delivered either through a direct-to-consumer model or through a retail model. While this sounds promising, this model has so far only been achieved offering dietary supplements, leaving most other PN products such as personalized meals or food products in the Valley of Death. The technology needed to implement truly holistic business models involving food is difficult to develop, with high sunk-costs and unproven in terms of scalability and profitability.

Service and advice models are a bit more straightforward, where firms gather personal information through self-reporting or mail-in kits. However, consumers themselves remain the main obstacle to mass market adoption. That is, to escape the Valley of Death these businesses rely on consumers to handle both reporting and implementation. There is a significant chance that customers don't act on advice or take advantage of the services offered, resulting in less than optimal results and reducing the customer's trust and thus willingness to continue to patronize these businesses.

Use case



LOEWI

loewi.com

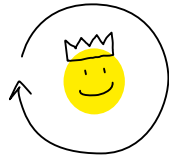
LOEWI GmbH is a scientific spin-off of the Technical University of Munich with the vision of making personalized health and nutrition available to everyone. In doing so, LOEWI stands for a healthy and active lifestyle in order to optimally support the individual health of customers and patients. They are also partner to the EIT Food Consortium.

LOEWI offers a subscription-based personalized dietary supplements service based on customers' responses to a questionnaire and a home blood test that analyzes nutrient levels. LOEWI also offers a mobile application that users can use to track the results of their blood tests. And while the firm does not provide personalized meals, their software does provide personalized nutrition recommendations.

Similar companies:

- Nourished
- Care/of
- Viome
- Panaceutics Nutrition
- Baze

It should be abundantly clear that in order for PN firms to succeed and climb out of the Valley of Death, consumers need to play an important role in the value chain.



To that end, customer centricity is the key foundational block to any potential business model. That means making any required behavior changes easy and approachable, but also ensuring that customers data privacy meets or exceeds regulatory standards. As mentioned, the processes that make up a PN value chain are incredibly complex, and there are often many stakeholders involved. To date, PN has only been marginally successful with recommendations or supplements, but no one firm has laid claim to providing a holistic nutritional concept with personalized food choices.

This offers the opportunity to address consumers with a variety of solutions and approaches. But it's also clear that no single stakeholder can do it all. Collaboration between stakeholders is required for joint innovation, pre-competitive research and new business model formation in order for the industry to move ahead.



Zoe

joinzoe.com

Zoe takes a novel approach to personalized nutrition, using big data and machine learning to develop predictive insights on how people will respond to different foods. The firm provides customers with a home testing kit that includes a blood sugar monitor and stool sample collector. Customers receive guided advice on what and how to eat, with the goal of improving gut health and reducing inflammatory responses caused by diet.

While Zoe provides one of the broadest and comprehensive analyses available on the market, the level of customer intervention required for successful implementation is steep. The home testing kit likely will only appeal to customers with far more than just a casual interest in personalized nutrition and is therefore a significantly smaller market segment.

What's more, Zoe relies on gathering health data from as many users as possible. But with a smaller segment, it is not clear how they will be able to gather enough data to conduct accurate predictive analytics.

Similar Companies:

- Lykon
- InsideTracker
- Levels Health
- Hologram Sciences
- Arivale (failed in 2019)

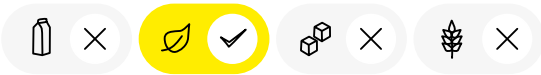
Solutions and opportunities: Finding the business models that work

Despite all the uphill battles the industry faces, we believe there are opportunities on the horizon that—if executed properly—can result in a profitable, sustainable business model for personalized food products and services. It's important to remember that making personalized nutrition concepts available to mass market—and not only for niche customers who are willing to spend time and money—is key to overcoming the niche status and thus escaping the Valley of Death.

In this section, we will explore four possible solutions for implementing a profitable and sustainable personalized nutrition business:

- 1 Personalized eGrocery
- 2 Gastronomy
- 3 Personalized Nutrition Platform
- 4 Subscription-based, personalized Meal Service

1 Personalized eGrocery



Ecommerce has been around for over 20 years and while online grocery sales certainly existed prior to the Covid-19 pandemic, widespread lockdowns around the world forced consumers to purchase more groceries online than ever before, with nearly 80 percent of consumers in the United States buying groceries online. What's more, this trend is not dying off, with more than half of consumers saying they now shop online for groceries more frequently.²⁰ Indeed, the online grocery business is projected to swell to \$641 billion through 2024, with already established ecommerce and retail firms like Amazon, Alibaba, Sainsbury, and others leading the charge.²¹

In many ways, personalized nutrition has already been introduced in this model. Customers can self-segment based on their nutritional needs such as organic, gluten-free, diabetic-safe, etc. We believe that this model offers even more opportunities to offer even more granular segments for customers based on metabolic types or biomarkers such as omega acids, vitamins, cholesterol levels, etc.

Consumer advantages



- Easy to use
- Convenient as part of their customer journey
- Consumer is in charge of their private data and chooses how much they want to share

Industry advantages



- Consumers are used to shopping online and using filters
- Easy to expose customers to new concepts in personalized nutrition without requiring significant behavior changes

- Low complexity, easy to implement, with sufficient existing ecommerce infrastructure available
- The right combination of assortment, user experience, and customer service will build loyalty and trust, add value for customers, and create lock-in effects
- Data-rich operations can provide new insights into customer habits and behaviors, driving optimization around individual preferences

Challenges



- Segmentation is not true personalized nutrition;
- Need for self-evaluation to filter and identify product categories and types
- Health impact is not supervised and does not take into account cooking methods, which could negate PN's health benefits
- No holistic value chain; customers need to do all the work themselves
- Potential conflicts between suppliers and retailers, depending on how categories are showcased and/or filtered

Retailers pursuing this route have an opportunity to connect results from home testing kits to products, potentially offering a more nuanced and personalized shopping experience. Retailers could also offer meal planning and recipes based on test results, which in turn would generate added value for customers and thus engender loyalty. Lastly, retailers can bundle customer data from test kits and purchases that can then be sold to suppliers or other businesses to provide a secondary revenue source. One example is Nutribox, a platform under development by CNR and funded by EIT Food, which integrates a filter function into an eCommerce store. Another product example is the myDNA Slim collaboration by MyMuesli and Lykon where consumers can personalize their muesli online based on biological insights from a test.



ch.mymuesli.com/neuheit/personalised-nutrition/lykon

nutribox.store

20. Redman 2020

21. Yahoo! Finance 2021

2 Gastronomy



Fast casual restaurants, with an estimated \$126 billion market value, are another potential opportunity to bring personalized nutrition to a mass market.²² Indeed, plenty of restaurants already offer individualized meals e.g. salads, poke bowls, smoothie, etc. These healthy fast-food eateries focus on health-conscious consumers who may or may not be familiar with personalized nutrition but show general interest in healthy food concepts.

This model works for sit-down and delivery restaurants, both of which can leverage digital technologies to leverage PN in their menu and ordering processes. Customers control personalization, typically by filtering meal options based on pre-defined criteria. In many ways, this model has an enormous potential, exposing a much wider audience to the concept of PN, ultimately driving demand for more PN products and services.

Advantages



- PN exposed to new customers, potentially increasing target audience for PN concepts
- Convenience and consumer familiarity with fast casual restaurant format
- Potential low-complexity, depending on implementation
- Opportunity to collect and monetize additional data about consumer habits, needs, and preferences
- Potential to expand as corporate-owned or franchise

Challenges



- Data is fragmented with no universal standard and may either be unavailable or missing, depending on customers' willingness to share personal health data
- Additional work for the restaurateur to list all ingredients and measurements
- Emotional aspect of social eating is lost with rational PN concept which might limit the number of interested customers
- Less flexibility for the restaurateur: meals need to be exactly as described on the menu

Fast casual restaurants are a prime opportunity to offer personalized nutrition. While their business model only covers one segment of the value chain (eating), that segment has the potential to become far more personalized.

Indeed, software platform VitaMojo provides a comprehensive suite of tools, including methods for offering more personalized selections.

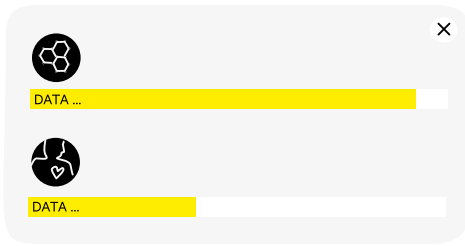


vitamojo.com

Integrating this business model would also be a good setting for businesses to gain a foothold in personalized nutrition, allowing them to first introduce the concept and its benefits to consumers, who can then more closely integrate PN concepts into other aspects of their lives.

22. Vig & Deshmukh 2020

3 Personalized Nutrition Platform



Instead of taking a retail, consumer-facing focus, PN can also be developed as a feature of a network of a variety of businesses. This would work by connecting a customer's already existing nutritional profile—extracted through DNA/blood/stool tests that also reflects taste preference, psychological parameters, and personal health goals—to their preferred delivery website, restaurant menu, or retail store in order to receive personalized recommendations. This model requires developing a sophisticated platform with both B2B and B2C components.

On the consumer side, users would be able to regularly take tests and upload the results. They would also be able to track purchases—from retailers, restaurants, food ordering platforms, etc.—which can then be translated into nutrition data and can be used as a basis for generating recommendations. This is an essential step that frees consumers from the burden of having to track and calculate nutrition data, thus delivering even more value and creating an environment with potential lock-in effects. On the business side, businesses can gain access to customer data to develop personalized products or services, and possibly use the platform to market their offerings to customers.

In this sense, such a platform work could potentially operate as much as a two-sided marketplace as it would a health and wellness product.

Advantages

- More personalized recommendations from a broader selection of retailers/restaurants
- Recommendations based on full nutritional profile and not only self-selected filters and categories
- High convenience: Consumers only need to grant access to their nutritional profile and do not need to manually set filters
- Customer loyalty and trust building adds value for customer, while creating lock-in effects

Challenges

- A platform of this nature would take a significant investment to build and market
- Serious data privacy challenges in terms of who gains access to users' information and how it is used

This business model, while highly complex and challenging, perhaps represents the most aspirational opportunity in personalized nutrition. Instead of trying to build a customer base for a single set of products, this model works to build a customer base for a larger number of suppliers/retailers who offer PN products or services.

Dutch technology firm Happ is, in fact, developing a personalized nutrition ecosystem complete with nutritional tools for consumers.



happworld.nl

4 Subscription-based, personalized Meal Service



Because personalized supplements sold as a subscription have already gained traction among consumers, a subscription to a personalized meal service may also be interesting to a select group of consumers. In fact, many consumers are already familiar with supplement subscriptions, while boxed meal subscriptions, frozen ready-to-eat meal subscription services and even personalized pet food subscriptions have also significantly grown in popularity in recent years.

For many consumers, time is their most valuable asset and adding a personalized meal option to these services would be a fast and direct method of introducing personalized nutrition to an audience that is already receptive to the subscription concept.

Advantages

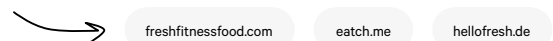
- Convenience due to subscription model
- High health impact because PN is consumed regularly
- Low overhead, no need for sunk costs developing infrastructure if offered as an option to an existing subscription service
- Commitment/Lock-in: Consumers pay in advance for meal delivery and can benefit from allowing their subscription to continue

Challenges

- Variety: Modular meals like salads, poke bowls, etc. are easier to personalize, but lack the variety that most consumers crave
- Freshness: Modular meals must also maintain a level of freshness that packaging isn't always able to achieve when shipping food
- Difficulty: Delivering meals that are less modular can pose significant scaling challenges in terms of personalization
- Meal planning: To what degree can consumers choose what they receive? The fewer the choices, the less appealing a PN meal delivery service might be
- Requires external nutritional profile service provider

Out of all the potential business models that PN can take, this one is potentially the easiest to implement, particularly if it is developed within an existing meal subscription platform. What's more, this model offers significant lock-in effects and can be used as a tool to educate more consumers on PN concepts.

HelloFresh is an excellent example, where many customers tested the service and ultimately got hooked for its convenience. Other examples of companies working on this model include Eatch and Fresh Fitness Food, who are working to overcome scalability issues.



This model capitalizes on consumers' increased interest in convenient, healthy, and personalized food choices.

Making the Personalized Nutrition business work

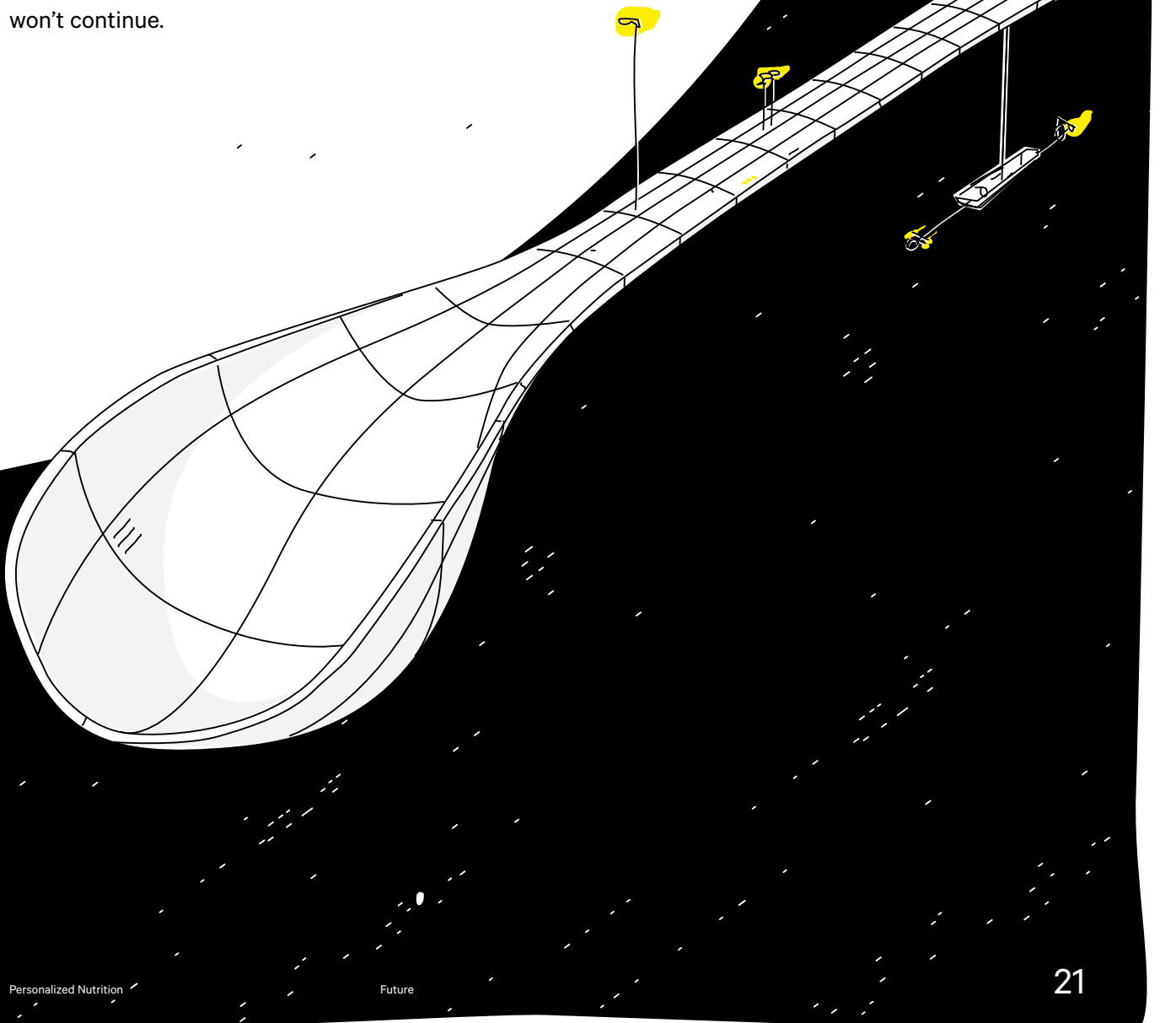
We believe the above-described high-level solution opportunities can move personalized nutrition further along towards mass market. In considering and comparing them, two important challenges are fairly obvious:

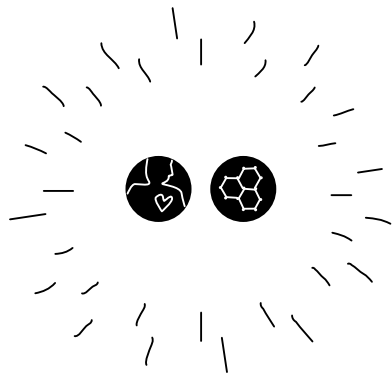
- 1 Any PN business model will benefit from a more connected value chain. The more connected the steps are, the greater the value they will be able to generate for both the consumer and the business.
- 2 There is a clear need for a nutrition profile standard. While biomarkers and other health-related metrics are common to everyone, not all tests or platforms will be able to use all PN data without a data standard.

The Future of Personalized Nutrition

While it can be difficult to predict the future, it is possible to look at today's trends in order to predict the direction an industry is taking. To that end, here are a handful of ways we see the personalized nutrition industry evolving.

Technology is certainly a core driver in terms of the interest in and acceptance of personalized nutrition. Indeed, advances in both biotech and consumer technology have driven the industry to this point, and there's no reason to believe this won't continue.





On the bio tech side, measurement and analysis of biological data will likely become more convenient and more cost-effective in the next decade enabled by developments in computing, bioinformatics and artificial intelligence making the access to highly personalized nutrition more convenient and cheaper.²³

Similarly, on the consumer side, it is conceivable that wearable technologies will improve to the point where more specific and accurate bio data can be collected. This might be an adhesive patch with built-in sensors or a consumable bio sensor that will make gathering gut microbiome data easy.²⁴ Alternatively, cheek swabs may start to be used to gather microbiome data as well.

Food production technology is already advancing with lab-grown meat and 3D printed foods. While still nascent, both these food technologies are likely to gain momentum for a variety of reasons; both can also be easily fortified with vitamins or nutrients that correspond to a person's specific biome, nutritional needs and taste preferences. They can therefore be products with added value that can be priced at a premium.

Another technological breakthrough that has gained traction recently is the development of smart home appliances. While more and more

homes are being equipped with voice-activated virtual assistants or smart thermostats, there has been very little developed in the food/kitchen industries. In the future, smart kitchens might monitor the diet of an individual. Additionally, "smart toilets" could potentially incorporate stool and urine sample collectors, or even built-in sensors to analyze a customer's personal waste. Taking that a step further, a smart toilet could even communicate with a smart refrigerator, which could then order foods for delivery based on the results of the toilet's analysis. These could easily replace the self-reporting requirements needed for today's business models, alleviating a significant hurdle in delivering PN products and services.

Smart appliances may connect to a nutrition platform and order ingredients for us based on our nutritional needs at any given moment in time. The applications can vary as much as people—from athlete's home blenders whipping up a morning smoothie based on their exercise regime to a patient with a chronic illness having meals prepared with the precise nutrients needed to help them manage their condition effectively.²⁵

In fact, appliance manufacturers are already dipping their toes into this arena with smart appliances that connect to a smartphone application that tracks nutrition and offers recipes. The more interconnected technologies become, the more likely they will become a reality and reach a mass market.

Finally, healthcare, insurance, and other organizations may also play a role in the proliferation of personalized nutrition by offering discounts to users who provide their health data. They may incentivize users with discounts based on that user's nutritional metrics, though this concept certainly touches on issues regarding data privacy.

23. Chui, et al. 2020

24. Chui, et al. 2020

25. Mahnke, et al. 2020

Conclusion

Ultimately, we believe the industry will either thrive or fail based on two key factors:

First, no matter what business model is followed, a completely connected platform and a holistic system are needed to create a perfect value chain. Whether that is provided under a single umbrella or through the cooperation of partners, a successful implementation of a personalized nutrition program relies on shared data at each stage.

Secondly, and possibly most importantly, it's essential to retain the emotional aspect of food. Most consumers today don't just eat to meet their daily calorie requirement, they eat to enjoy the sensations food can bring. That is, people eat for the emotional and social experiences that food brings—whether it's a family enjoying a shared meal or a high-end tasting menu at a Michelin-starred restaurant, people want to relish the experience of eating. We believe that personal nutrition should be a gateway to that experience, a combination of enjoyment and good health!

If you want to dive deeper into the world of PN, do not hesitate to approach us!



Clément Tischer
NX-Food

Head of Innovation & Partnerships
clement.tischer@nx-food.com



Charlotte Dyba
NX-Food

Expert - Food, Methods & Innovation
charlotte.dyba@nx-food.com



NX FOOD

“We equip our partners with innovations to transform the food system for a sustainable tomorrow.”

NX-Food stands for Next Generation Food. Our recipe: Expertise, Network and Implementation. NX-Food advises METRO and its partners on the implementation of innovation processes,

sustainable food concepts, technology and product innovations as well as corporate venturing activities. Their wide array of strategic cooperations and a network of founders, culinary & scientific experts, customers, investors and corporates make NX-Food the hub for the future of food – as well for established food companies as for startups.

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Authors



Clément Tischer

NX-Food

Head of Innovation & Partnerships

Clément has more than 7 years experience in the startup ecosystem from startup perspective as a co-founder and corporate perspective as co-initiator of NX-Food. As Head of Innovation & Partnerships he focuses on the implementation of innovation processes, sustainable new food concepts and product innovations as well as corporate venturing activities.



Charlotte Dyba

NX-Food

Expert - Food, Methods & Innovation

Charlotte has a focus on innovation management and has worked in various areas ranging from innovation consultancy to accelerator programs to corporate innovation units. She holds a Master degree focused on Strategy & Innovation from Maastricht University.

Co-Authors



Nard Clabbers

Happ

happworld.nl



Simone Frey (PhD)

Nutrition Hub

nutrition-hub.de



Georg Schirmmacher (PhD)

EIT Food Central

eitfood.eu



Mariette Abrahams (PhD)

Qina

qina.tech



Kerstin Burseg (PhD)

EIT Food Central

eitfood.eu

Partners



EIT Food is the biggest open innovation community for food in Europe. EIT Food's vision is a world where everybody can access and enjoy sustainable, safe and healthy food - with trust and fairness from farm to fork. EIT Food's multi-stakeholder community consists of more than 200 food sector partners driving innovation and cooperation across Europe. Our top-tier entrepreneurship programs are designed to identify, build, grow and sustain ag-food start-ups helping them to cross the valley of death.



The Institute of Sciences of Food Production (ISPA-CNR) is a centre of excellence at international level, acting in the field of scientific research, innovation and technology transfer aimed at improving food safety and quality. By creating synergistic actions between scientific research and production sectors, ISPA-CNR fosters technological innovation paths of small, medium- large agro-food enterprises. ISPA-CNR has coordinated and is currently engaged in several national and international projects in the field of food and feed safety and nutrition by promoting innovative food products such as hypoallergenic foods, lines of probiotic and functional foods closely working in collaboration with medical research groups.



Since 2004 **Foodvalley NL** has been developing and strengthening an international ecosystem of organizations that work together to realize the transition to a sustainable and healthy food system. We work closely with corporates, SMEs and governments at every level, and with renowned educational and research institutions. Partners of the Foodvalley ecosystem challenge, support and connect with each other. Together, we set the agenda and initiate and develop programs to scale up innovations more quickly and help companies to develop and grow more swiftly. The new activities that we foster generate international interest and create a flywheel of scientific development and economic growth that brings benefits for all. We need to work together to realize breakthrough solutions that lead to structural system change – for our own future and that of generations to come.

Check out the →

[Foodvalley Personalised Nutrition Position Paper 2021](#)



Nutrition Hub is the game-changing knowledge hub curated by leading nutrition expert to drive the future of nutrition. With our unique network of entrepreneurs, investors, influencers and scientists we guide companies into the future of nutrition. This includes developing sustainable nutrition strategies, composing advisory boards of experts to gain innovative insights, hosting expert roundtables or executing expert interviews covering food and nutrition topics. We have become one of the largest expert communities reaching over 20 k nutrition experts, industry representatives and founders/ investors.

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Thank you. ❤️