



FUTURE SCENARIOS ABOUT PERSONALISED NUTRITION IN EUROPE

The **Food4Me** project looks to address the fundamental question of how can we best use our current understanding of food, genes, and physical traits to design healthier diets tailored for each individual, and to analyse the opportunities and challenges in the field of personalised nutrition.

Food4Me will explore the application of individualised nutrition advice. It will also investigate consumer attitudes and produce new scientific tools for implementation.

Food4Me aims to:

- Determine the application of personalised nutrition, through the development of suitable business models, research on technological advances, and validation of delivery methods for personalised nutrition advice.
- Compile current scientific knowledge and consumer understanding of personalised nutrition – including best practice communication strategies and ethical boundaries – to be shared with EU institutions, the food industry, and other stakeholders.

As a first step to achieve these aims, Food4Me provided an opportunity for a mixed group of stakeholders to conduct a comprehensive assessment of the opportunities and challenges for personalised nutrition business models in the future. *'Future Scenarios about Personalised Nutrition'* is based on the ideas and expertise of the participants.

► Health and Nutrition in Europe

● What we eat and how much we eat are principal factors for the increase in chronic health problems in industrialised societies. In Europe, the imbalance between energy intake and energy expenditure has resulted in an alarmingly high prevalence of obesity, which is causally linked to the incidence of chronic diseases such as diabetes, cancer and cardiovascular diseases. Diets that are high in saturated fats, high in salt, low in fibre, or low in micronutrients also contribute to ill health.

Whilst chronic diseases have negative and far reaching impacts on individuals, they also impose a heavy burden on national health care systems. Supporting Europe's rapidly ageing population is an additional budgetary strain.

These costs are a key internal factor contributing to the increasing gap between economic value creation and the associated cost structure of our national economies. This imbalance is unsustainable in the long-term. Reversing the obesity epidemic and 'eating for health' would have a major impact on reducing the societal and economic costs of chronic disease.

A sustainable shift in eating habits towards healthier diets will not be easy to achieve. Clearly, individuals are directly responsible for what they eat. However, a complex interplay between many external agents: regulators, industrial sectors, medical professionals, the media and social networks influence the choices individuals make. Making healthier choices are critical for the future health of our bodies and our societies.

► Future Scenarios about Personalised Nutrition Why Scenarios?

● Determining what novel personalised nutrition businesses and value creation concepts may be possible and useful in the future, requires assumptions about what that future will look like. With current approaches to health and nutrition at a critical juncture, many aspects of society are uncertain. Scenarios are a way of combining complex and difficult-to-formalise factors into stories with tangible contexts. Developed from the participants' careful consideration of likely external driving forces and critical uncertainties, the scenarios offer four very different, but also plausible and logical, possible futures.

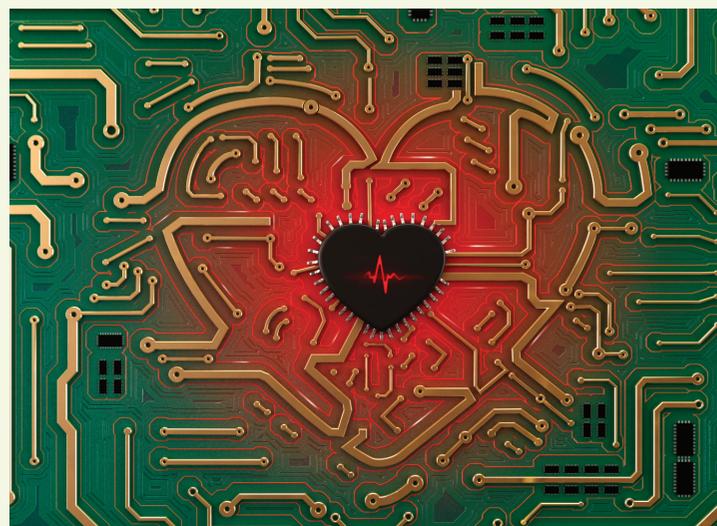
Scenarios make it possible to explore which personalised nutrition offerings (PNOs) may materialise within the possible contextual environments. Scenarios provide both an inspirational background against which business models can be developed, and a set of contexts in which they can be tested and evaluated.

► Scenario Narratives

In all of the scenarios one of the underlying driving forces for change is growing financial pressure on current curative health care systems.

1. Smart Sister

● The 21st century sees a growing scarcity of material and human resources in Europe. This triggers the need to improve efficiency in the use of these resources, to increase production, self-sufficiency and global economic competitiveness of the European region. Scarcities also trigger growing social unrest that begins to undermine social cohesion. This adds to societal costs, such as unemployment, through conflict and crime, reduces overall productivity and economic surplus.



As the system starts to show signs of 'spinning out of control', governments are pressed to take action to rebalance the cost of society with economic value creation. To do this, resources are re-allocated on the principle of value return. Excesses and destructive, counter-productive or wasteful behaviour need to be controlled. To be democratically acceptable, such decisions need to be evidence based. This requires significant information systems to trace the problems back to the people responsible for them. Information relating to social security and health is increasingly centralised in a coherent system (Superbrain) that collects, consolidates and analyses data. Software defines what and when to give feedback to the system and the citizen.

By using feedback from Superbrain, health control measures are directed to the right population groups and slowly the balance between costs and benefits in the health care system is regained. New technological developments in on-line and in-body monitoring feed ever-increasing information to Superbrain. This allows the system to react instantly to reduce periods of non-productivity. The system becomes increasingly based on preventative measures orientated towards specific populations, groups and individuals to ensure future health risks are minimised. Employers are early adopters, seeing the system as an opportunity to guarantee a more productive workforce. It soon becomes part of the standard work package of all employees.

By 2030 there are hardly any epidemics. People's health risks are assessed early on and they are assisted to make the right lifestyle choices to reduce their risks. Non-responders face societal pressure and possibly financial penalties. Average productive working life increases, giving Europe the flexibility to adjust the retirement age in order to maintain global economic competitiveness. Retired people enjoy a better quality of life due to preventive orientated health care. If and when fatal illness strikes, society favours palliative care and euthanasia.

Superbrain is also increasingly supplied with data on food intake, allowing the health care system to advise on dietary behaviour. Using the information available from Superbrain, the food and supplement industry develops food offerings in line with the most typical recommended lifestyle patterns. Individual tweaks for special health conditions or performance requirements are made available through customised nutritional packages, ordered individually and downloaded at home. The core aspect of this scenario is data-based individual nutritional advice to optimise health.



2. My Health My Home

● Europe is going through difficult economic times. Health and social security have very limited budgets and all available funds are already allocated to maintain a necessary level of economic support measures, and to protect the most vulnerable. The problem of growing public health care costs is being resolved by gradually increasing the privatisation of health care. The shocking revelation is that overall infant mortality is increasing which triggers the decision to roll out the Health Care Savings Account (HECSA). This is a European idea that has been in development as a response to increased privatisation; it is designed to be regulated at a national level.

The HECSA-based system makes health a more tangible asset for everyone by rewarding health-promoting behaviour in the short term (in addition to any health benefits which may be experienced in the long term). The consequences of choices that have an impact on health are made more visible. The main driving mechanisms are financial; individuals act to protect the value of their HECSAs, and there are incentives for healthy products and activities.

There is a free market with regard to health choices; people are expected to choose a way of life that allows them to balance the desired quality of life with the cost of health. Those with limited incomes have to be more careful in their health choices, although there is a safety net in case of hardship or bad luck in terms of health. The affluent have the budgetary freedom to indulge in unhealthy choices and pay for the cure. Over time more desirable products and services are added to the HECSA package (swim classes, gym membership, etc.), which steers the system to a better equilibrium.

A wealth of new businesses emerge, which all aim to tap into the spending power that HECSAs generate. Their products and services fuel a new 'health economy'. By 2025, such businesses become sizeable and are considered to have excellent investment growth potential. Pharmacies have extended their offering into diagnostics, diet and lifestyle advice. Consolidation of health businesses creates 'health supermarkets' where people can get everything that promotes health. Larger centres develop partnerships with other services such as health and lifestyle clubs, training facilities and health education services, and are increasingly seen as the new fashion in leisure. The notion of healthy activity and body care is ingrained in society.

Everyone is free to invest in HECSAs as they please. Those who wish to engage in HECSAs but do not have the means, such as the unemployed, receive an annual contribution from society to their account. People can also decide not to invest in health, but to carry the high cost of curative interventions if and when needed – and if they can afford them. The main thrust of the My Health My Home society is survival of the fittest.

3. Me Inc

- European societies function within a highly regulated environment in which individuals are increasingly reluctant to take responsibility for their actions and are quick to resort to costly litigation. A growing share of the population considers regulation to be too restrictive and oppressive, particularly when contrasted with the wealth of options emerging from the online and virtual world.



New consumer movements start to emerge centred on fundamental values such as food, health and safety. The people who take responsibility for healthy diets and lifestyle no longer accept restrictions imposed on the population as a whole to curb unhealthy consumption patterns, such as taxation and restrictions in distribution. Consumer groups start interacting with other stakeholders such as food, pharma and insurance companies about their needs and desires. These companies welcome the opportunity to have direct dialogue with end-users, and are prepared to develop benefits specifically for these groups, resulting in special products, distribution systems and on-line shops. The success of this spreads rapidly across Europe; assisted by the fact that communities are essentially virtual – people don't need be in the same physical location. Communities soon represent large numbers of the most adept and able citizens. Governments start to adjust regulations to accommodate the desires of these new power blocks.

The self-regulating communities look to develop new management structures and membership becomes more formal, based on adhering to certain rules, meeting certain requirements and probably making a financial contribution. Over time more communities emerge, each focusing on a different aspect of 'quality of life' (food, health, lifestyle, spiritual, art, etc.). People are free to apply to any community or to several.

The authorities' relationship with communities changes from regulator to facilitator and enabler. They assist communities to develop suitable legal frameworks and maintain basic societal values, such as civil and human rights. Authorities continue to manage legal and public services.

In *Me Inc* health care services are increasingly becoming a private undertaking in which communities broker the contracts between individuals and health care service actors. As community-driven systems require a relatively high level of intellectual engagement, they may not have become universal throughout Europe by 2030, unless supported by significant educational efforts. Public health care is available as a safety net for people who do not have the intellectual, physical, or financial capability to join a community. However, its budget is substantially lower by 2030 than today. The core aspect of *Me Inc* is individual choice.



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4. Nudging Society

● A growing societal awareness that current health problems require a very long-term approach leads to the decision to “start acting now for the current and future well-being”. ‘Quality of life’, which encompasses all aspects of well-being, including health, is established as the main driving value in society. This value is realised as Quality Adjusted Healthy Life (QAHLY); a broader concept than the existing ‘free of disease’ approach.

In this world, ill health must be addressed as it reduces ‘quality of life’. With the current curative health-care approach being unsustainable, the focus of health care is directed towards prevention of chronic disease. The ultimate goal is the prevention of illness.

Because ‘quality of life’ may mean different things to different people, some degree of choice is built into the health care system. People with an identified or diagnosed health risk are offered a choice of evidence-based options to reduce their risk or improve their health. People are also free to choose different courses of action including ‘fringe’ options or to do nothing, but they are then solely responsible for the consequences and costs. Health caretakers and authorities ‘nudge’ people to accept the recommended options, and societal pressure starts to build on non-responders.

The health care system gradually emerges through a democratic process that is managed by the citizens to fit the common ‘quality of life’ view. It is designed to operate towards a ‘minimum standard QAHLY’ that is universally applicable to everyone in Europe. There are small adjustments to accommodate for local/regional differences, cultural or religious attitudes as well as for special needs of different population groups. Authorities act as enablers; they provide resources to build the system, help citizens to set the rules and limitations, and provide education for users. A qualified service is available to assist those who are incapable of engaging with the system.



The new approach’s first visible effects on public health are a decline of disease-related absences from work, a halt and the beginning of a reversal in obesity epidemics, and a slow but notable increase in people’s general physical activity. Chronic disease is very slow to respond but, by the end of 2030, both its frequency and occurrence are beginning to decline. Another effect is a change in food consumption as people become aware of the impact of food on QAHLY. Food companies respond by improving nutritional quality, avoiding waste and reducing costs through local sourcing. Consumers’ awareness also triggers greater transparency about food supply, production and distribution; this gives consumers the opportunity to select foods with positive effects on the QAHLY of farmers and local shops. Consumers act to drastically reduce household food waste. All of this translates into a more efficient and productive food chain.



QAHLY is increasingly applied to other areas, buildings, transport, work, and politics. Information from authorities, NGOs and industries stimulate greater public understanding of the impact of activities on QAHLY. Social networks and real-time gaming environments trigger more people to take QAHLY into account. As with the food chain, QAHLY measures improve industrial production and the efficient use of resources contributing to an improved economic output. The resulting affluence is invested by new entrepreneurs to add new aspects to the ‘quality of life’ vision, e.g. mental health, life-long learning, active elderly living, etc. The key driver of a Nudging Society is convincing the public.

Next steps in the Food4Me project?

In the following phase of Food4Me, the four scenarios will serve as an inspirational background to develop new business model concepts for personalised nutrition. In addition, they will provide a canvas to evaluate how robust each business model concept is in various societal contexts.

► Scenario Comparison

The table shows how the four scenarios differ in a number of key aspects.

This is only a general outline; details will differ between societal groups and/or geographical regions.

	SMART SISTER	MY HOME MY HEALTH
Dominant logic	Efficiency	Private Health Asset Management
Key activity	Monitoring	Investing
Governance type	Hierarchy	Responsible Autonomy
Health systems storyline	Public - managed centrally to minimise costs and impacts on productivity. People assigned preventative disease and lifestyle advice.	Privatised - funded largely by government regulated HECSAs. Individuals have a choice to balance their lifestyle and health costs.
Food Consumption	Food access and affordability guaranteed by governments. Food will be increasingly regulated and increasingly standardised to meet nutritional balances, while maintaining as much convenience as economically possible.	Healthy food offerings increase to meet the drive for more health-oriented consumption. Affordability is not guaranteed for all and some can even afford not to bother about healthy diets. Price is the ultimate limit of choice.
Health Care Sources	A central management system with artificial intelligence capacity. Recommendations channeled through most appropriate provider.	Fast growth for a wide variety of services enabling self-care. Development of health supermarkets and destination health centres.
Business Environment	Strictly regulated and complex. Public-private partnerships common.	Both processed food and health retail will see significant innovation whereas with primary food and traditional retail the emphasis will be on sustainable production and distribution, rather than health.
Regulatory Environment	Substantial regulatory and legal framework, supported by financial measures.	Minimal - governments supervise HECSA systems to prevent abuse.
Information Environment	Scientists and medical profession most trusted. 'Chip' the most important information carrier.	Primarily industry seeking customer loyalty. Social networks are the most important information carrier.
Ethical Environment	Majority able to achieve health and well-being at a reasonable cost. Some opt out. Choice limited in order to contain health care costs.	Individuals empowered by freedom of choice. Freedoms far from universal, choice can be divisive and lead to significant social inequality.
Assessment	Regulated but fair distribution of health care. Loss of individual empowerment.	Individuals left to make their own choices. Society may struggle to cope with social inequalities this may create.
Possibilities for Personalised Nutrition Services	Mainly preventative health and specific target groups. Health professionals' support crucial. Consists of on-line feedback-loops.	Relatively small market for high- tech services. Value for money and consumer confidence crucial.

	ME INC	NUDGING SOCIETY
Dominant logic	Manifesting Values	Health Commons Management
Key activity	Choosing	Stewarding
Governance type	Heterarchy	Responsible Collectivity
Health systems storyline	Privatised - community controlled and driven. Contracts brokered on individuals' behalf. Basic public health care is available as a safety net for the most vulnerable.	Public - based on common view of 'quality of life'. Change induced by convincing rather than coercing.
Food Consumption	Food choice abounds, both catering for low to high budgets, and from ultra-convenience to super-healthy. Food is a clear expression of lifestyle. Nobody starves as society protects lowest cost options.	Focus on dietary patterns. Food development re-adjusted to fit Quality Adjusted Healthy Life Years (QAHLY) approach. Technologies and food options available are designed to maximise QAHLY returns.
Health Care Sources	All types of health care are in practice. GPs' role less prominent as alternative community health circuits emerge. Community/peer support typical.	Recommended scheme of actions and health care actors for each risk and illness. People pay for options outside the scheme. A minimum service is available for the most vulnerable.
Business Environment	Open but more volatile market. Networked, regional or community based.	Open market but within 'responsible' framework. Customary collaboration with strong sense of community benefits.
Regulatory Environment	Community based self-regulation within limited European framework. Strong drive to avoid over-regulation.	Typically soft-handed, backed by financial incentives, penalties and legal measures. Social pressure is high.
Information Environment	Internet used by 99% of population. Communities use different information sources and carriers.	Good quality and trustworthy communication by all actors. Price signals good basis for nutritional choices.
Ethical Environment	Well-being determined by ability to join suitable communities. Strong communities but fragmented society.	Widespread well-being. Relatively limited degree of choice. Common understanding and values create harmonious society.
Assessment	Community approach is self-supporting and self-regulating. Can only sustain a minimal proportion of non-joiners.	High level of conscious social control based on voluntary compliance.
Possibilities for Personalised Nutrition Services	High demand for individual services. Scientific basis for PNOs weak. Market small, but unit value high. Immediate benefits and privacy crucial.	Positive environment for PNOs. Slowly expands from high-risk groups to everyone. Public-private partnerships most likely.

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