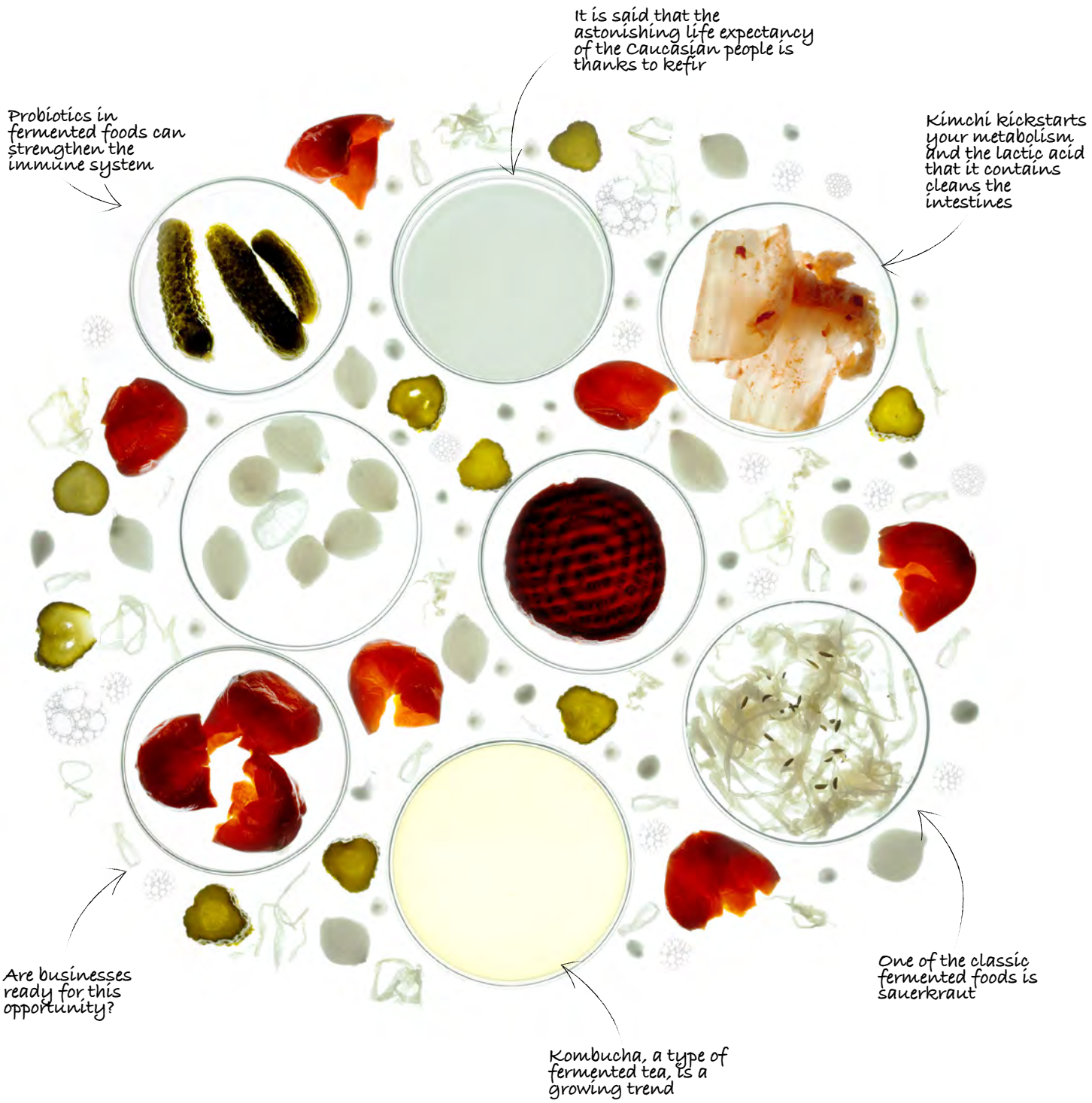
Lantern Papers

Rediscovering Fermented Foods

Understanding the power of live food



Content

Image: Restaurant Mingles

The world of fermented foods is very broad. In fact, it is estimated that almost one third of the food that we consume is fermented.

In his documentary "Cooked", Michael Pollan expresses how every journey through the kitchen implies a transformation of foods, among which fermentation is the most mysterious and miraculous of all. One leaves a certain food lie, and over time it becomes transformed into something delicious, with more qualities than it had at the start.

The beginning of life as we know it arose from the evolution of single-celled organisms that over thousands of years have been in close contact with other microrganisms, mainly bacteria, giving rise to living creatures like plants and animals.

The use of fermentation in cooking and processing foods is present in almost all cultures around the world. For centuries, human beings have used fermentation processes to preserve foods and simultaneously instill them with distinctive characteristics like alcohol content, more acid flavors and other functional properties. Amongst some of the most popular fermented foods are sauerkraut and pickles found in Central and Eastern Europe, Korean kimchi, anchovies, dairy products like yogurts and cheese, cured meats like chorizo and pepperoni, and beverages like wine and beer.

Many chefs are currently introducing fermented dishes into their tasting menus. As it happens, Mario Sandoval, chef in the double Michelin-starred restaurant Coque (Madrid), has just released an impressive new book entitled "Gourmet Fermented Foods". Other top-rated chefs like Magnus Nilsson (Fäviken), David Chang (Momofuku) and Shima Shimizu (Sesame) also include fermented foods in their latest recipes.

The world of fermented foods is very broad. In fact, it is estimated that almost one third of the food that we consume is fermented. This report will focus on only one category of fermented foods: those that maintain their micro-bacterial activity and still contain probiotic properties at the moment of consumption. These live foods contain unique and in many cases still unknown functional properties. At Lantern, we believe that the time is now to rediscover these remarkable foods, from a functional and gastronomical point of view, and this paper aims to deliver wherever possible, a clear and open foundation of knowledge regarding fermentation that allows society to benefit from all of its potential.

What are fermented foods?

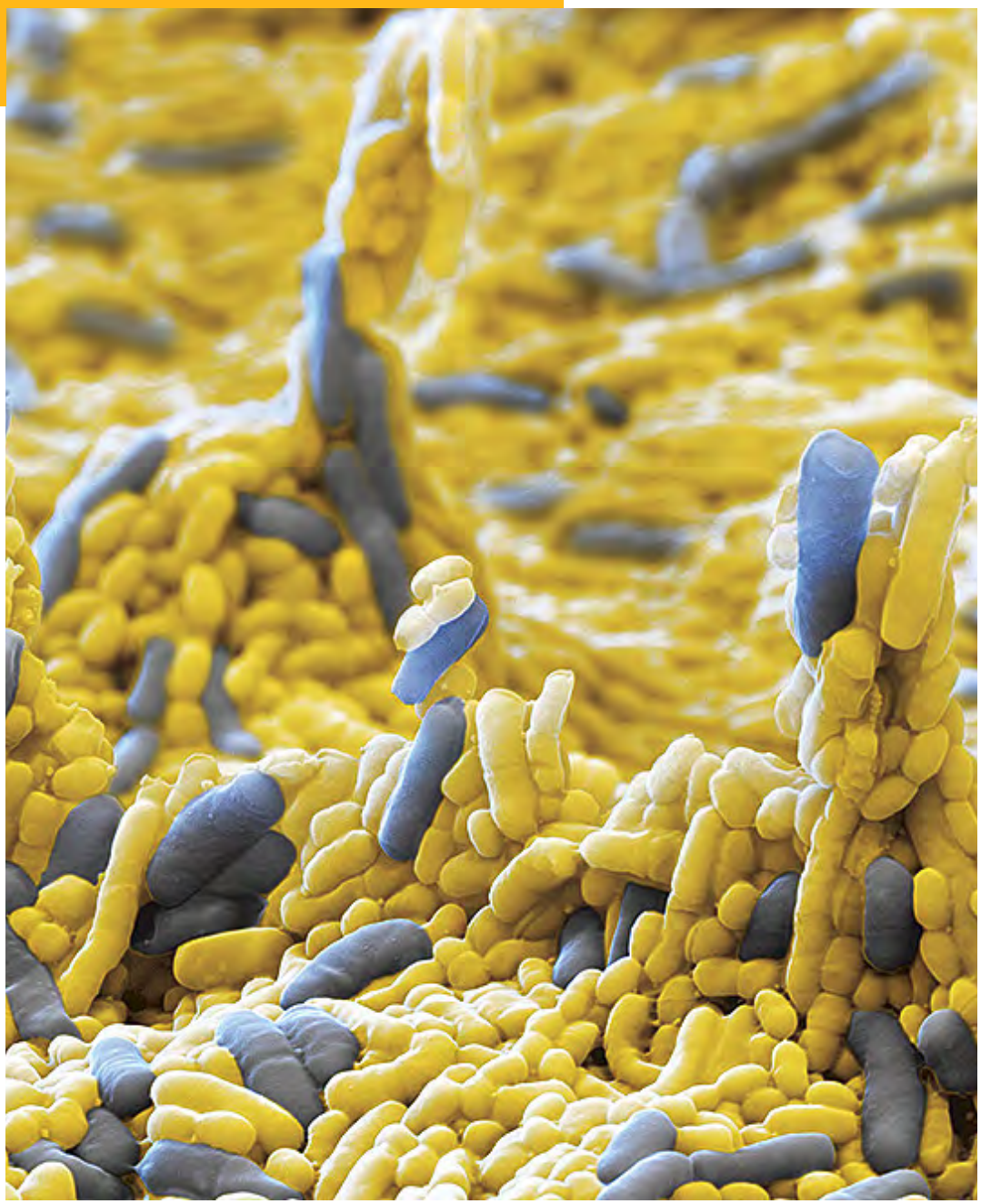


Image: Steve Gschmeissner / Science photo Library

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The process of fermentation was discovered by Louis Pasteur. Fermentation isn't anything magical, technically it's just a process of anaerobic transformation that doesn't require oxygen. The definition given by Sandor Ellix Katz, author of "The Art of Fermentation" and an expert in this field is more fitting: Fermentation is the transformation of foods through the actions of diverse enzymes, bacteria and fungi.

Because microrganisms thrive wherever they find favorable conditions, food items are likely to be microbiologically transformed with time, except in the case of dried or frozen products (conditions in which enzymes cannot function). The transformation can be harmful for the food, it can spoil or rot. On the other hand, it can also be beneficial, giving rise to a delicious product with a distinct flavor or texture.

In the simplest terms, we can say that these bacteria feed from the existing sugars in the food item, and in the process, generate other elements like acids or alcohols. Leaving aside alcoholic fermentation, which is the most well-known, the majority of fermented foods are subject to lactic fermentation. This fermentation transforms glucose and generates a waste product called lactic acid. This "waste" is what increases the acidity of the food's culture (decreasing the pH level), ensuring that new bacteria can't develop, impeding spoiling and making the food longer-lasting.

Another benefit of fermentation is that in this process of transformation, the food's nutrients are broken down into other smaller components, making them more easily digestible. In other cases, fermentation prompts the transformation of compounds that could be toxic to humans into harmless ones.

While modifying the qualitative properties of the food, fermentation also has direct benefits on our health. On one hand, because the process produces certain nutrients like fatty acids, vitamins, amino acids and proteins. On the other hand, because these types of food contain certain live bacteria at the time of ingestion that continue to act once they are in our bodies. These are what we know as probiotics. As we will see further on, the microrganisms produced by these foods are key for our health.

Image: watermelon.org

Image: Cleaneatingmag / Ronald Tsang

We shouldn't confuse probiotics (live microrganisms administered in suitable quantities lending health benefits to the host), with prebiotics. The latter are products that serve as food for bacteria that we have in our body and for this reason they are also critical to our health. These include food with a high fiber content, which acts as sustenance to these microrganisms, such as leeks, garlic, onion and artichokes.

One of the benefits of fermentation is that it creates an acidic environment that impedes the spread of new bacteria.

Shelf Life

Another one of the interesting aspects of fermented foods is their shelf life. As we have mentioned, one of the benefits of fermentation is that it creates an acidic environment that impedes the spread of new bacteria. For this reason, food that goes through this process has a very long shelf life.

Image: Lancaster online

The problem lies in organolepsy. In order to maintain its desired flavor throughout its shelf life, the product must be kept refrigerated, because at room temperature the process of fermentation will continue and as a result, alter the food further.

A Homemade Process

As mentioned, fermentation is a process dating back centuries, well before the industrial revolution. For this reason, it is a cooking method that until now has been predominately done by hand. Korean families pass down their secret kimchi recipes from generation to generation over the years, with almost everyone having their own special method and jars to make it.

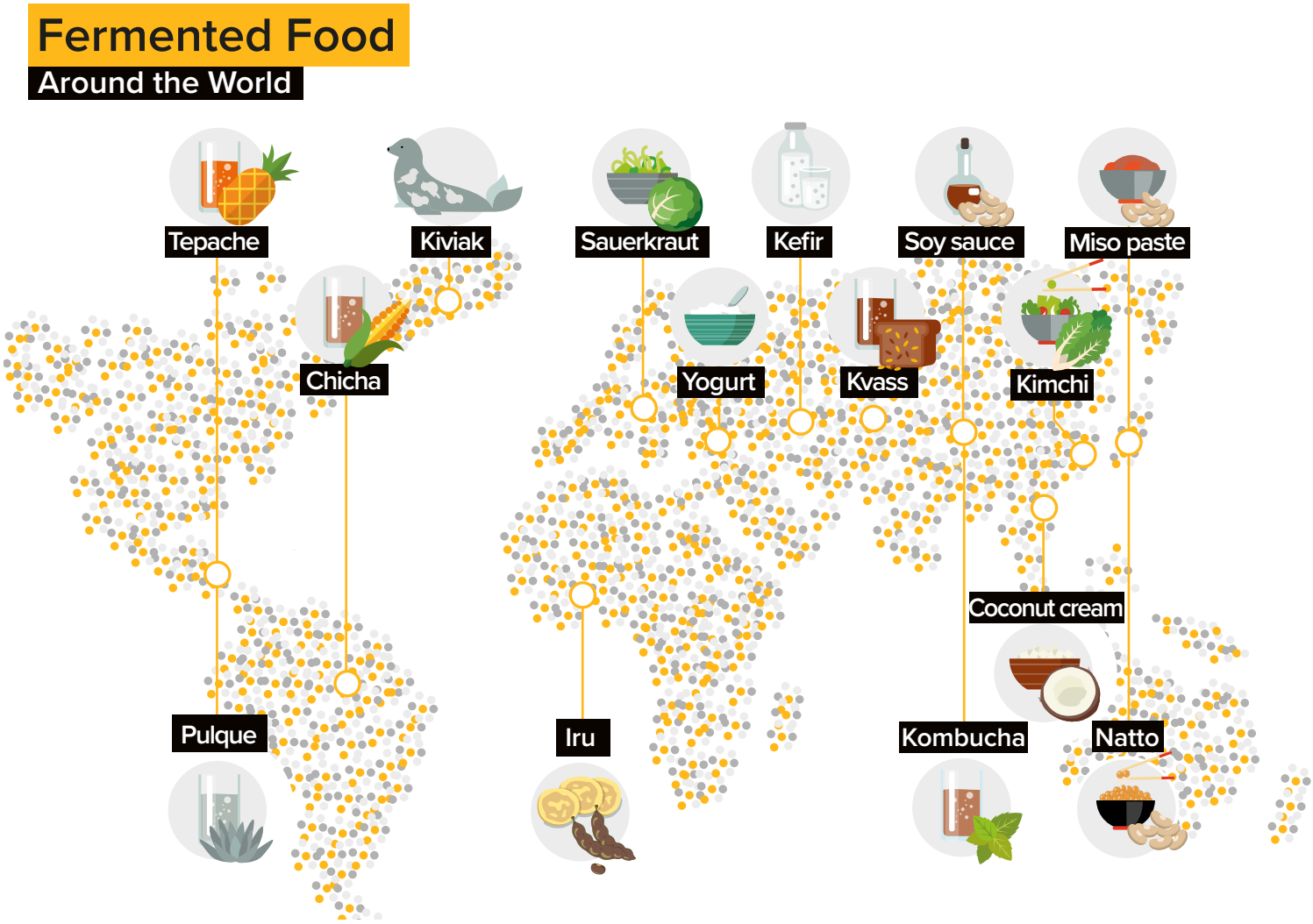
In olive-growing regions of Spain, families pickle their own olives to consume as an appetizer. The fungus that enables the production of kefir is shared between friends and family so that it can be made at home. Brewing kombucha has also become as zen as having a bonsai tree - those who do it at home share pictures of their SCOBY on Instagram.

Despite all this, there are more and more commercial brands that have standardized many processes and flavors, making these products more widely available on the market. This benefits consumers greatly, bearing in mind that the unique homemade processes take more time and effort.

Image: Unsplash

2 Popular Probiotic Fermented Foods and their history

Image: Gourmet Project



Fermented foods around the world

Fermented foods have played a large role in the history and gastronomy of many cultures all over the world. Some of them are internationally known such as sauerkraut or pickles, but others are also finding their place further away from home like kombucha or miso. In a highly globalized world, it's hardly surprising that these centuries-old traditions can travel so rapidly to new markets. For this reason, we will elaborate on a few of these fermented foods so that you may familiarize yourself with them in advance.

Lactic fermentation that combines cabbage leaves with salt, forming a natural brine with the juice of the leaves.

One of the most renowned fermented foods is of course sauerkraut. Although the biggest consumers of the fermented cabbage are mainly Central Europeans in countries like Germany, Poland, and Russia or in French Alcasia, this millenary recipe originally stems from China. It was the Mongolians that were in charge of bringing sauerkraut over to Eastern Europe, where the production technique was shaped by the Jewish population of those countries. Nowadays, Central Europe considers this a native dish and use it mainly as a side dish for meats.

Dairy fermented by the presence of yeasts, fungi and bacteria (Lactobacillus), similar to yogurt and made with any type of animal milk. Kefir grains can also be fermented in sugar water to make the well-known kefir water. Some kefirs can also be slightly carbonated.

Although many legends have surrounded kefir for centuries, what is definitely clear is that it originated from the Caucasian Mountains, where shepherds stored milk in leather pouches so that it fermented into a sour yogurt. Over the course of history, many miraculous powers have been attributed to kefir and it is said that the astonishing life expectancy of the Caucasian people is thanks to this fermented milk. Indeed, its name comes from the Turkish word “keif”, that means “to feel good”.

Kombucha is a fermented drink obtained from a base of sweetened tea fermented by a colony of microrganisms called Symbiotic Colony of Bacteria and Yeast, better known as SCOBY.

The origins of kombucha date back to around the 3rd century B.C. in the northeast of China in the region of Manchuria, and for this reason it is also known as Manchurian fungus. A few centuries later, kombucha arrived in Japan, from where it later spread thanks to trading routes to Korea, Russia, India and other countries, but it wasn't until practically the 20th century that this fermented tea arrived to the US and Europe.

Soy beans cooked and later fermented using the Rhizopus oligosporus fungus.

Primarily known in the vegetarian and vegan world for its high protein content, tempeh is native to Indonesia and a staple food on the island of Java. Bit by bit it has spread all around the world, and nowadays it is easily found in any health food or specialist store. The Dutch exported it from Indonesia during their colonization of the country and it was precisely a Dutch pharmacist and micro-biologist that started to investigate the tempus fungus.

Soybeans, cereals and salt fermented by the koji fungus.

This paste of fermented soy and cereals, like the majority of fermented foods, has a long history. The first known version was called “hishio”, which doesn’t have a clear origin as there is more than one version and country that this food is attributed to. However, all arrows point to China as its origin, with the food being later introduced to Japan by Buddhism. What is known for sure is that the current form of miso started in the Muromachi era (14th century A.D.), when soy began to be ground and consumed as an ingredient. Although now it is globally known by its Japanese name “miso”, this fermented paste is called “Jang” in Korea and “Tauco” in Indonesia.

Fresh vegetables fermented with the help of microrganisms in a saline solution.

Pickles, widely known and used in western culture, form another part of the fermented foods family. The aim of fermenting these vegetables is to preserve them to eat during the colder months.

Archaeologists place their origin in ancient Mesopotamia around the year 2400 B.C., although it was also estimated that somewhere around 2030 B.C. the first pickles from India arrived to the Tigris Valley. Pickles are mentioned twice in the Bible. They were admired by Aristotle for their curing properties, and years later were even shared by Roman emperors amongst their troops for their physical and spiritual qualities.

Fermented preparation of Chinese cabbage seasoned with spices and other vegetables.

There remains no doubt about the origin of this food; it is 100% Korean. What we also know is that the initial versions of the current kimchi were mentioned as “pickled radish” in Korean literature, in the works of Yi Gyu-bo (918 – 1392). Later, during the Joseon period (1392 – 1910), kimchi appeared as it is known today. The Korean tradition of Gimjang encourages many to produce large amounts of kimchi in the autumn to be stored and eaten during the cold winters in Korea.

Fermented beverage made with pineapple peel, brown sugar and cinnamon.

Originally stemming from Mexico, the popular refreshment tepache was brewed by tribes long before any Europeans reached the shores of Central America. Although originally fermented with corn, over the years, pineapple has steadily risen to become the popular base of the drink. The fermentation process gives rise to a very modest alcohol content, but tepache has been known to be mixed with beer for a slightly stronger taste. Other variations include using fruits like guava, tuna (fruit) or oranges as its base, or adding lime juice for extra tartness.

Kvass

A drink made from rye flour, malt and rye bread fermented in water.

Kvass is a fermented drink of cereals and black bread with herbs, honey and other condiments of Slavish origin. It used to be made by the Slavs even before the formation of Kievan Rus'. Among the first documents that mention it are the records of Prince Vladimir of Kiev's baptism into Christianity in the 10th century A.D.

In time, Kvass has become such a traditional and common beverage, that in Russia it was renowned as "Communist Coca-Cola". (In fact, Coca-Cola currently sells its own Kvass). Like the majority of fermented foods, it has been attributed with beneficial properties for digestion and healing over the course of its history.

Food for Thought

All over the world, many successful start-ups have been burst onto the fermented food scene in the last few years, continuously growing the sector. French start-up La Note Bio produces an array of fermented vegetables using a wide variety of vegetables and spices, applying ancient techniques with a contemporary twist. Los Angeles-based Health-Ade have also added their modern spin on traditional kombucha, combining diverse flavors along with strong marketing to propel itself towards the top of the US kombucha market. In the UK, Biotiful Dairy was started by an ex-Russian figure skater, who simply started making kefir for a taste of home after moving to London. From here, its cultured milk products have taken the UK market by storm, and in doing so have enticed many more to enter the market.

Among all of these examples it is also worth mentioning Ferment9, a shop specializing in fermented products located in Barcelona. Here we can find kombuchas and kefirs, but also vegetables like sauerkraut, kimchi, anchovies and other pickled goods. They are a reference point in their industry.

3 Why is now the time for Fermented Foods?

Image: Like A Vegan

Fermented foods have been part of our food culture for centuries and aren't anything new. But if this is the case, why have these types of products become a relevant trend to consider right now?

Increased Health Care

Healthier habits, looking after what you eat and having a balanced diet are increasingly ingrained in modern society, although it's also true that the way in which we pursue health varies among people, countries and environments.

Image: Unsplash

Nowadays, healthy foods, and especially those that positively affect our bodies, are of great interest to consumers. For this reason, consumers are now paying greater attention to functional products. These products help us to look after our health in a simpler and more natural way, versus the use of supplements or medicines.

In today's world, superfoods have become increasingly popular due to the fact that they are perceived as ingredients with significant properties, but with natural origins.

As part of this ongoing search for improved health, one of the main trends is the use of natural products. Consumers are growing more and more skeptical of processed foods and unknown additives, explaining why foods with few and recognizable ingredients are becoming more attractive.

In today's world, superfoods have become increasingly popular due to the fact that they are perceived as ingredients with significant properties, but with natural origins. This is the case for quinoa, chia, ginseng and many others. In light of this, it's clear that fermented products will prove to be very popular due to the fact that they derive their functional properties in a completely natural way, without any chemical additives or complex industrial processes.

The Veggie Trend

More and more people are upping their vegetable intake or adopting a vegetable-based diet, whilst cutting down on their consumption of animal products. A large part of the fermented foods that we analyze in this study are suitable to include as in these types of diets. These "veggie" consumers are very conscious of their health and are in constant search of new products that they can incorporate into their diet, as well as being much more open to trying these types of foods.

Search for new flavors and textures

Image: Nama, Artisan raw foods

Today's consumers are hungry for new experiences. The search for novelty and the urge to experiment are leading them to try different flavors and textures. In the case of fermented foods, it's true that trying them may require a slight nudge, given that the initial flavor is unfamiliar to many. In this instance, the fact that the majority of ingredients are derived from common foods like vegetables, tea or milk, not to mention all of its benefits, help to break down the initial barriers to the unknown and the strong smell that these products usually emit.

Image: Eat and love, Madrid

The Asian Boom

Asian cuisine is one of the largest growing food trends at a global level, a significant proportion of it being Japanese and Chinese in origin, although Korean food has also played its part. Asian food culture is rich in fermented products, with many ingredients like miso and kimchi being key elements in some of their best-known dishes. The appeal that this type of cuisine has worldwide will help to introduce new fermented products and help consumers discover new flavors and textures.

Their History

Ancient techniques, natural processes, deep-rooted origins... Fermented foods have all the elements necessary to present a strong, believable and powerfully appealing story. Many of the trends defining modern consumers' tastes and preferences in media and social networks are inherent to these foods.

Growing research into the effect of bacteria on our bodies

In the last decade, many scientists have been focusing their research on the role that bacteria play in our body and in the cause and treatment of various diseases like diabetes or cancer. Although there is still no definitive data regarding the mechanism and effects of microrganisms, it is known that the presence of certain bacteria is correlated with the regulation of certain diseases, especially when focusing on the immune system. Once the relationship between certain bacteria and their effect on health is established, an important new range of functional foods will be opened up. Probiotic foods, of which many are fermented, contain a type of bacteria that researchers are continuing to analyze.

The Science Behind Fermented Food

4

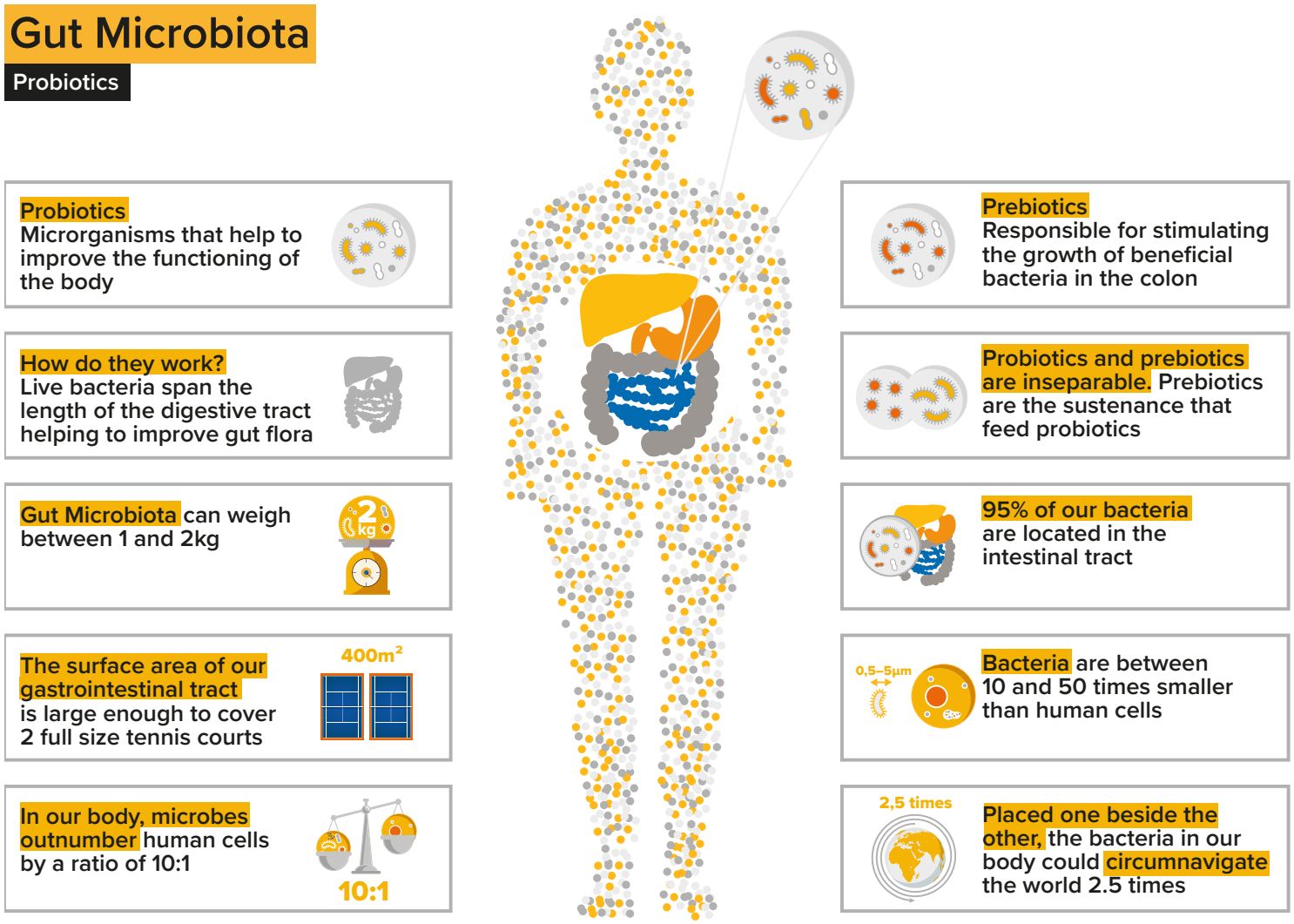
Image: Unsplash

Microbiome and Microbiota

Many bacteria and other microrganisms inhabit different parts of our body. Far from being a problem, their functioning is fundamental for our health and well-being. This group of bacteria and microrganisms is known as the microbiota. We should not confuse it with the microbiome, although it is used in a similar way, since this term is much more concrete. Scientists use the term micobiome to describe the set of genes present in all microbial cells inside our bodies.

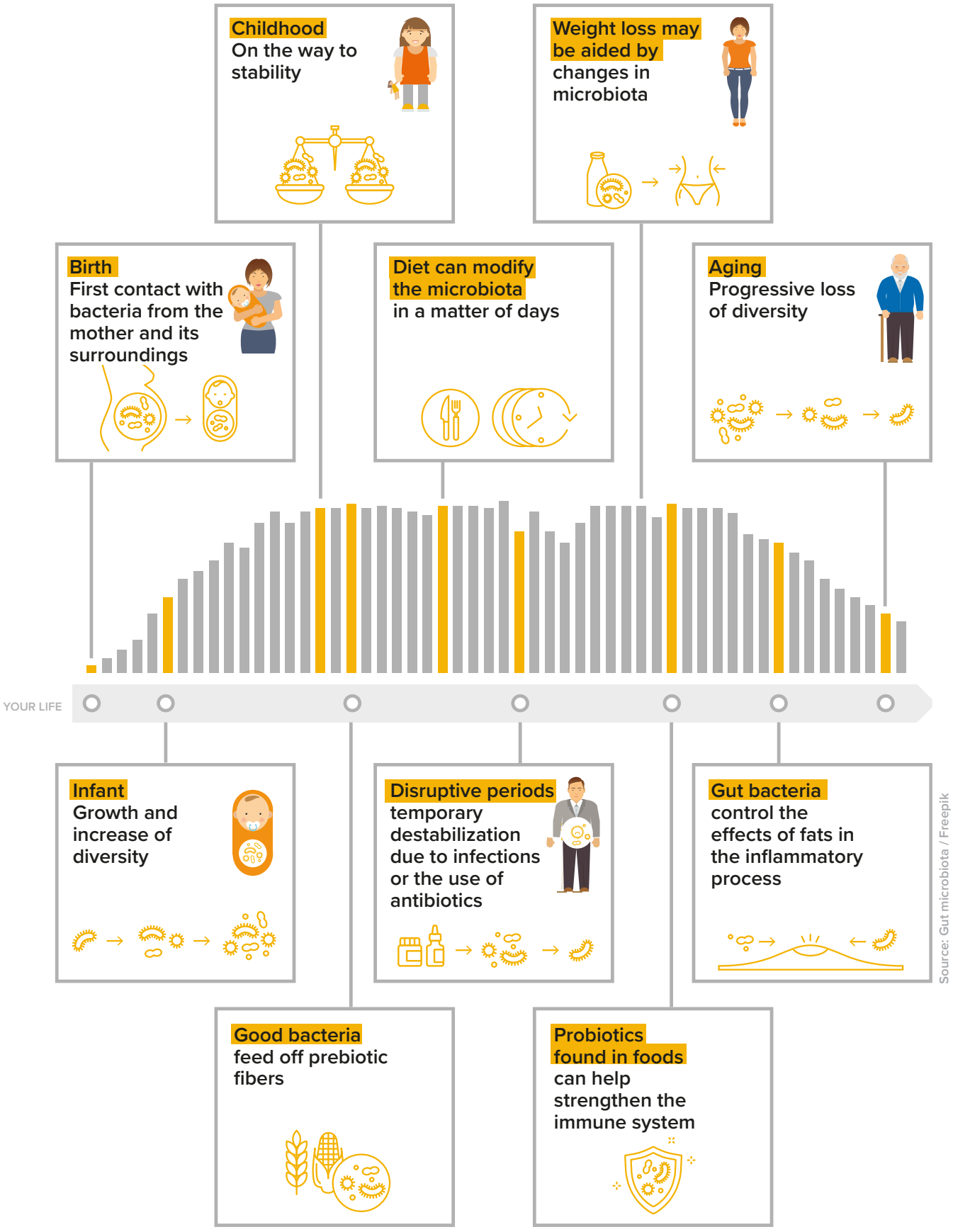
To give us an idea, the number of microbial cells in our body exceeds our human cells in a ratio of 10:1, whilst it is also estimated that every person has between 1 and 2 kilograms of bacteria in their intestines. Microbial cells are found in diverse parts of our body; skin, mouth, lungs, genital tract, etc., but the largest proportion, approximately 95% of our bacteria, is located in our intestinal tract. Until now, they have been mistakenly known as gut flora.

These bacteria play an important role in our body because they help produce certain vitamins like Vitamin B12 (essential for brain function and the nervous system, among others), B9 (folate, necessary for production and maintenance of new cells) and Vitamin K (for blood clotting), among other things. They are also responsible for producing what are known as short-chain fatty acids (butyrate, propionate, etc.) These molecules support the immune system, are important for healthy digestion and are believed to help balance blood sugar levels.



The Evolution of the Gut Microbiota

Throughout Life



Similarly, the microbiota acts as a barrier to harmful microrganisms by completely surrounding them, inhibiting any further growth and depriving them of resources they need in order to develop. In addition to this, they help the immune system to differentiate pathogens from more beneficial organisms.

The microbiota forms in our body from the second that we are born. In fact, a significant difference exists in an individual's microbiota depending on whether they were born naturally or via caesarian. Throughout our lives, the ecosystem that develops this set of bacteria can suffer significant changes, the most common causes being a poor diet, stress and the use of antibiotics.

In order to carry out its functions correctly, the microbiota should be diverse, balanced and stable. When this state of balance is absent or altered, we can experience dysbiosis. Some of the ways in which this alteration manifests itself are digestive problems, obesity, allergies and Type 2 diabetes, all of which are highly linked to lifestyle.

A good, balanced diet, prebiotics and certain probiotics can help to correct, and even prevent this situation.

Some define this ecosystem as a new organ that offers a new approach to therapeutic treatment. For this reason, fermented foods are of vital importance for our health. Many of them contribute to a healthy, varied and stable microbiota.

Ten years of inconclusive, but very promising, research

Scientists have spent the last decade investigating these organisms and their role in the body. In fact, in 2008, the Human Microbiome Project emerged as a follow up to the Human Genome Project. Its main objective has been the identification and characterization of the microrganisms found in the human body. The project has managed to configure a reference database, including the parameters within which the human microbiome varies due to disease and medication. Furthermore, it has been

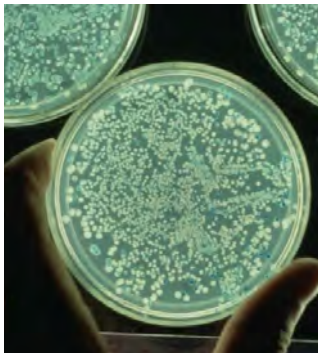


Image: Human Microbiome Project

discovered that similar bacteria do not always carry out the same activities, which in terms of investigation, logically complicates defining which bacteria should be ingested for any given type of activity or outcome.

Relationship with Disease

The microbiome is now a huge focal point in applied medical research. Hundreds of scientists and research centers are currently working on distinct lines of investigation surrounding the implications that the bacteria from our body have on different diseases.

In fact, one of the first studies that was published on an international level regarding this topic links the microbiota with the effectiveness of a certain type of autoimmune treatment for cancer. According to Leticia Corrales, researcher in the area of Immunology at Aduro Biotech (US), and co-author of this study, the investigation showed that rats with a certain type of bacteria in their microbiota showed a significantly greater response to a specific autoimmune treatment versus those who didn't have this same bacteria. According to Corrales, the results were very conclusive, although "we still do

The microbiota forms in our body from the second that we are born. In fact, a significant difference exists in an individual's microbiota depending on whether they were born naturally or via caesarian.

not know the mechanism by which this occurred". Others' lines of investigation are focused on obesity and diabetes, both of which are very much associated with the state of the microbiome. Thus far, it has been observed that the bacteria in our body are linked to short chain fatty acids, and that these have an important impact on the control of our blood sugar levels. In the Public University of Navarra (Spain), Miguel Barajas has been investigating these relationships, as well as developing probiotic products for people and animals in conjunction with food companies since 2015.

The effects of the microbiome on neurological diseases like Parkinson's Disease and Alzheimer's are also being investigated, as it is believed that there is an intestinal axis in the development of these illnesses. However, according to Miguel Barajas, all of these fields of investigation are still only beginning to be developed, as there are no clear studies with sufficient evidence to be conclusive as of yet.

Leticia Corrales, researcher in the immunology area of Aduro Biotech (USA)

Miguel Barajas, Public University of Navarra (Spain)

The only diseases that are well-documented and for which there exists a greater consensus amongst the scientific community about links between the microbiome and a specific disease are gastro-intestinal and digestive disorders like Crohn's disease and Irritable Bowel Syndrome (IBS). At the moment, the only treatment that has been proven with certain guarantees to treat the problems derived from a deficient microbiome is microbial transplants. These are carried out by faeces banks, which store and analyze samples from healthy individuals for future implantation, allowing the incorporated bacteria to be naturally established in the intestinal tract of the recipient.

Microbiome and Startups

On the basis of all this knowledge, there are already some distinct business models beginning to emerge. Two of the startups that are currently operating on the basis of their profound knowledge of the microbiome are Viome and DatyTwo. These two companies have a very similar value proposition: through a faecal analysis, they prepare a report on the microbiome of the customer and provide him/her with a specific diet according to their results and characteristics. In 2016, Nestlé Health Science invested heavily in Seres Therapeutics, a pioneering company in the research and treatment of diseases through the microbiome. In the coming years, we will undoubtedly see the rise of numerous businesses in this field, as well as a strong interest from nutritional and pharmaceutical companies alike.

5 The Fermented Probiotic Products Market: How do we take advantage of this opportunity?

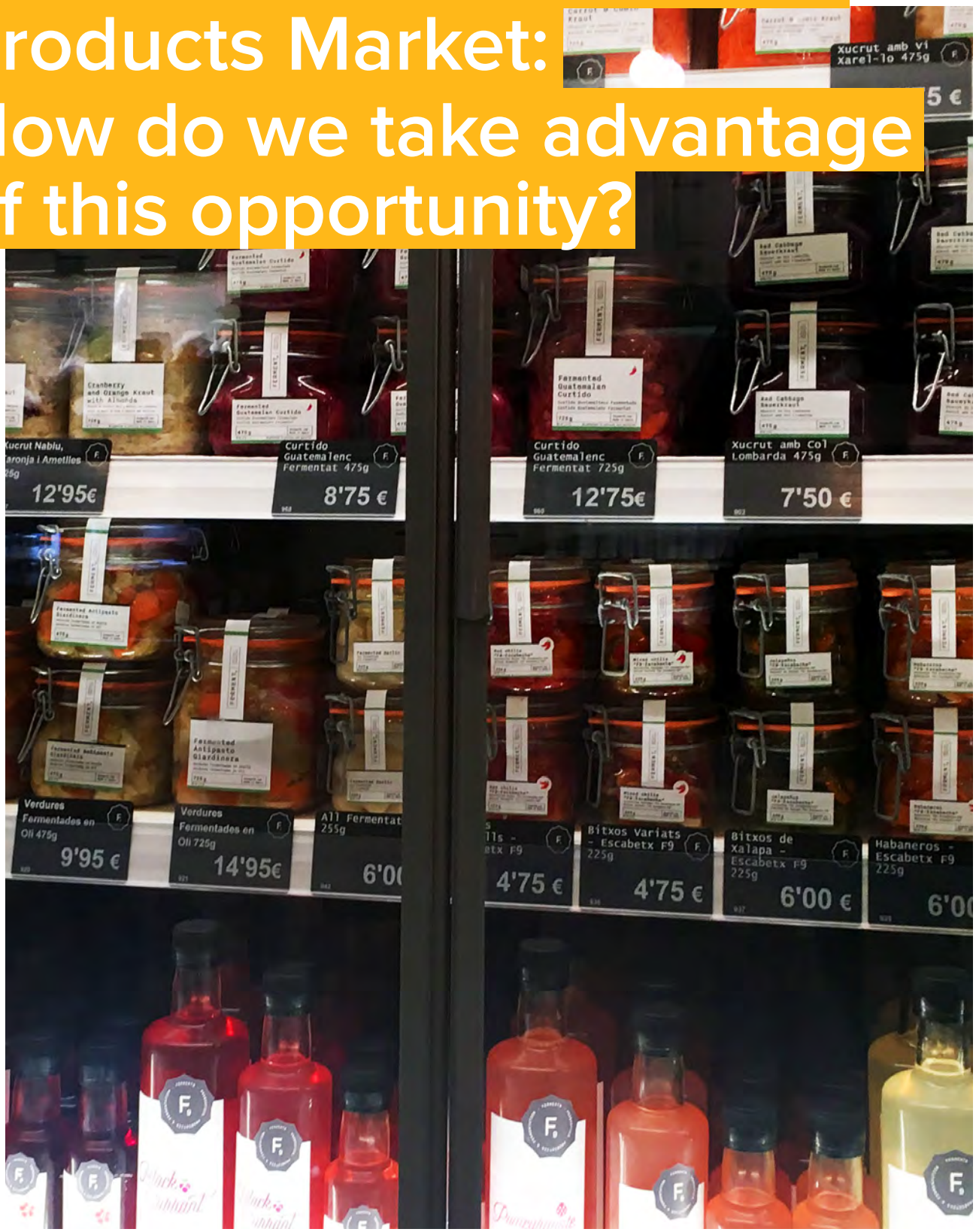
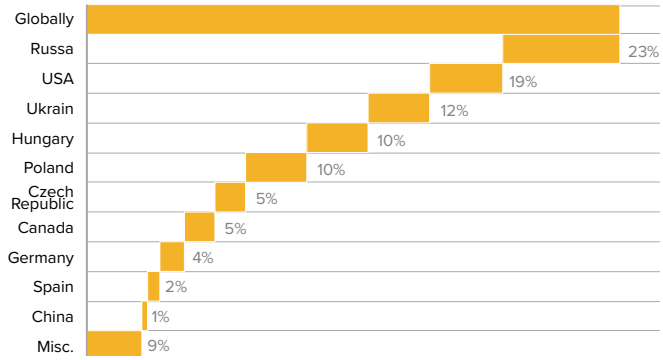


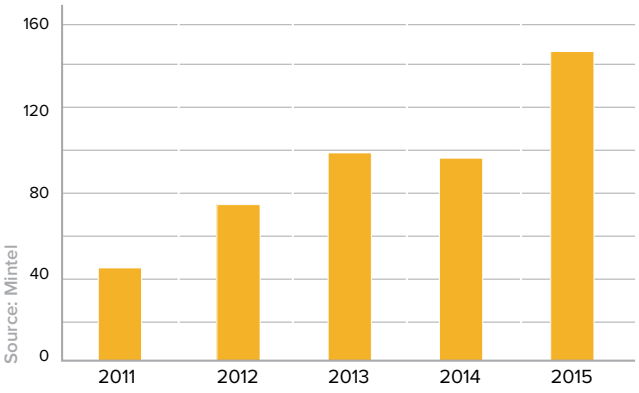
Image: Revista Cuerpomente. Photographer: Alfredo Garófano

The probiotics market consists mainly of dairy products, yogurts and fermented milk, but is recently witnessing growth in fermented kombucha teas, as well as fermented vegetables like sauerkraut and kimchi. However, many of these products are pasteurized, meaning that not all of them can be considered probiotics, even though they are fermented. The probiotics market includes some over-the-counter (OTC) products, which are not analyzed by this paper. According to Euromonitor, the supplement, probiotic yogurt and fermented milk markets were together worth upwards of $40 billion in 2016 (the last year that data was collected). In 2010 this figure was $30.4 billion, indicating growth of more than 30% in a short period of time.

Out of all dairy products, the kefir category stands out. Valued at over $1.2 billion, it is expected to reach $2 billion in 2023 with a CAGR of 7% (Euromonitor) and exponential growth in the number of new companies, especially in Eastern Europe, according to Mintel. Lifeway, a leader in the American market, had sales of $124 million in 2016.

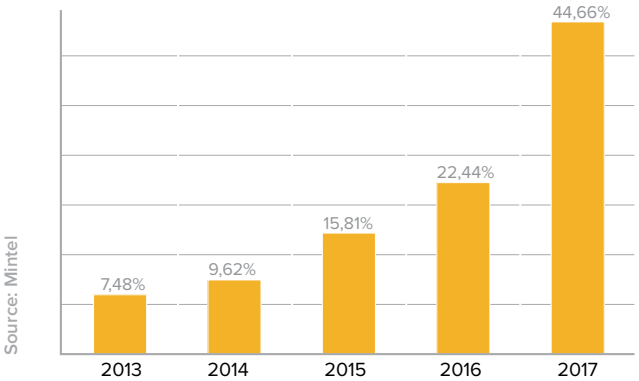
Growth of kefir products released globally and distribution by country, 2015





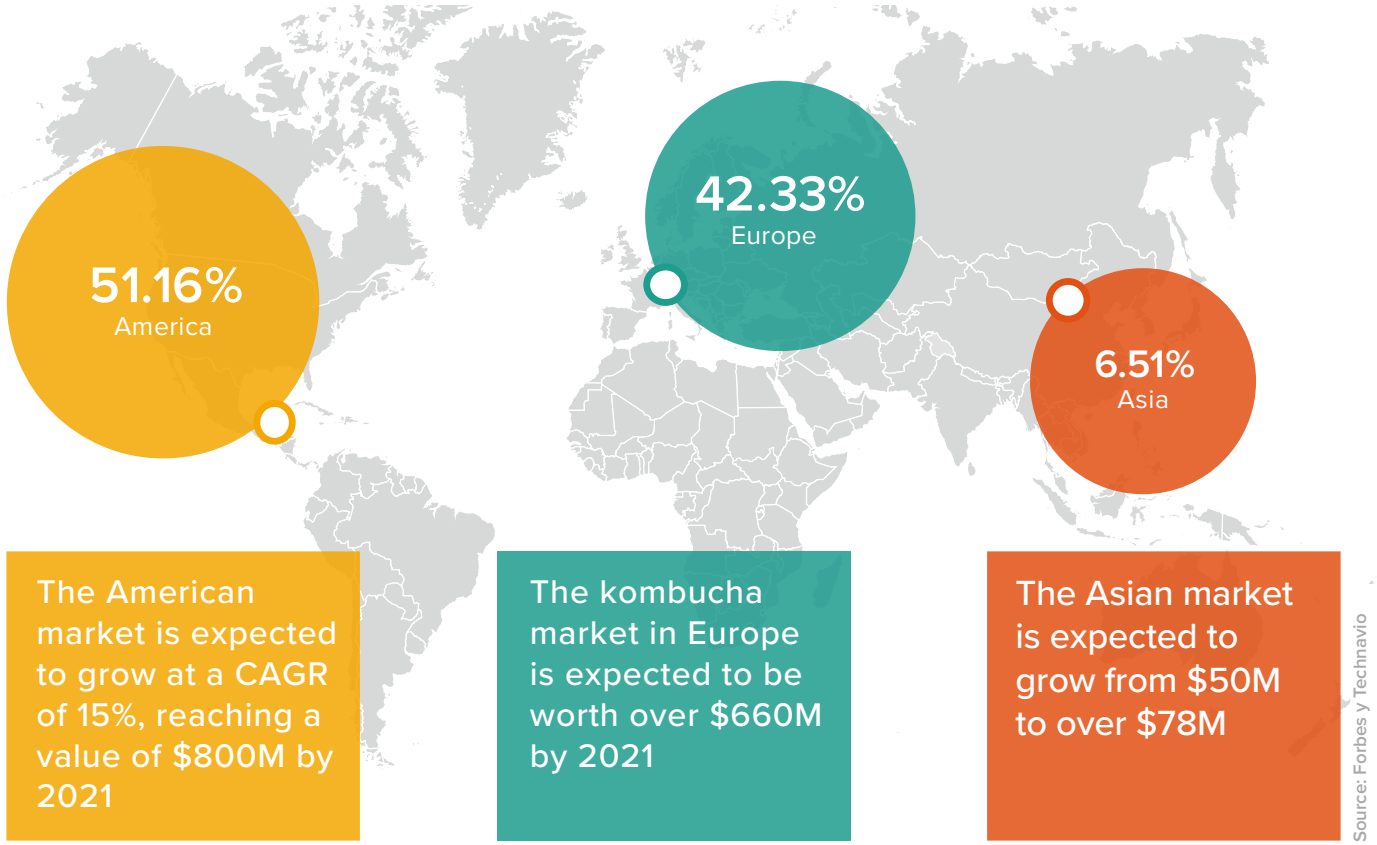
We must also not forget kombucha, considered the largest growing functional drink by Forbes, which is expected to grow between 15-25% in sales in the period between 2016 -2021. Technavlo estimate that by 2021 this market will reach global sales of over $1.5 billion dollars. It is expected that sales will surpass $660 million in Europe and $800 million in the United States. After all, 51% of young Americans aged between 25-34 years old drink kombucha according to Mintel. In the US, GT's kombucha is the market leader with over $100 million in sales in 2017.

Annual growth of kombucha products launched in Europe, USA and Canada (%)



Despite all of this, what stands out the most is the huge growth witnessed in the overall category over

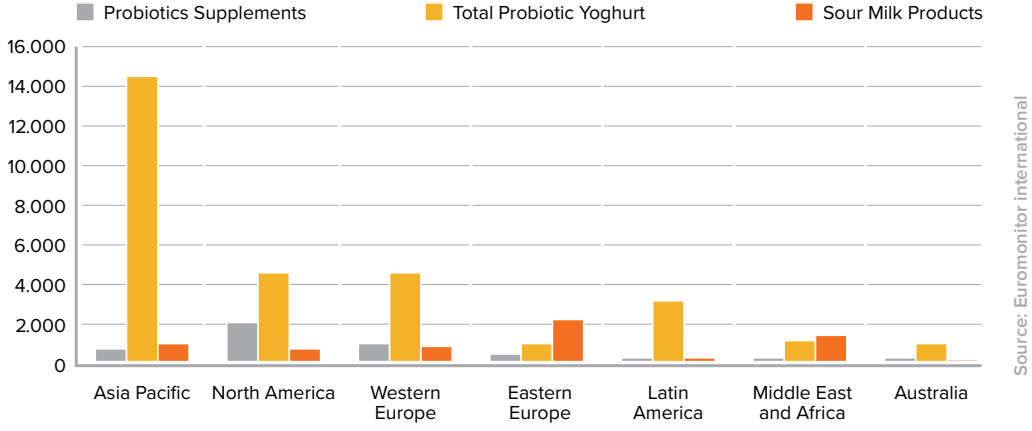
Distribution of global kombucha market, 2016



the last few years. To give us an idea, 100 probiotic products were launched onto the market globally in 2002. In 2016, 1,800 probiotic products were launched, with the United States being the primary market. According to Innova Market Insights, in 2017, almost 2% of all new products at a global level contained probiotics.

From a sales perspective, over the next 6 years this category is expected to maintain a forecasted growth rate of around 30%. Some sources like Global Market Insights estimate that by 2024 this category will surpass $55 billion.

Retail market value of probiotics by region, 2016 (US $ million)



Who demands these products?

In general terms, we have identified three types of consumers of fermented foods. One profile of consumers of fermented foods are driven by the trend, attracted by ferments' healthy and alternative image, in a society that is heavily influenced by what they see on social media. But this category goes much deeper than a fad or being Instagramable.

A second important group of consumers of fermented products are those who already include it as a part of their regular diets, especially present in Central and Eastern European countries, where sauerkraut is a standard food in homes. As a result, there is already an existing and developed market. Not to mention Asia, where products like kimchi are a part of national identity.

The third, and one of the most interesting profiles, involves people who buy these products in an effort to improve their general health. Probiotic products and fermented foods are garnering more and more attention from the media and many people are flocking to these products for their health benefits.

A sector with multinational interest

Of all fermented products, kombucha and kefir are getting the most attention and experiencing the most growth. For this reason, numerous multinational companies have turned an eye to this market. The first was Red Bull with their launch of Carpe Diem in 2009, although this is actually a pasteurized product. Pepsico also bought the kombucha brand Kevita ($42 million in sales in 2016) for $200 million.

KeVita (Pepsico)

Carpe Diem (Red Bull)

Farmhouse Culture (General Mills)

Another one of the large companies that have delved in to the world of fermented foods is General Mills, recently investing in the startup Farmhouse Culture, devoted to fermented foods and drinks.

Kvass (Coca-Cola)

In Russia, where the sales of kvass have risen notably since the trading sanctions and resurgence of nationalism of the Putin era, Coca-Cola have invested time in developing their own brand of the drink. Heineken have also launched various brands of this traditional drink, prompted by the fall of beer sales.

Regulatory Issues

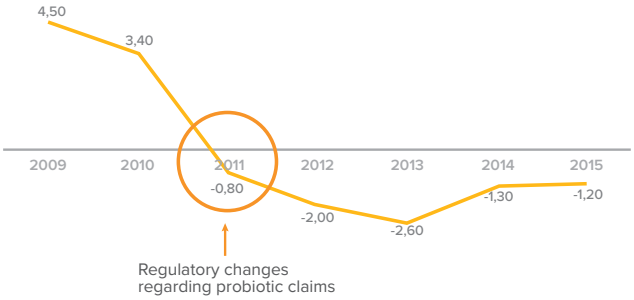
We find more barriers to the development of these types of products on a regulatory level. At present, in Europe, the EFSA does not permit the use of the term “probiotic” for any type of commercialized food product. In contrast, the American FDA is a bit more lax in this regard and allows the term probiotic to be incorporated in products without specifying the benefit that the consumer might derive from it.

In both cases, the reality is that there exists a fine line between some medicines and some foodstuffs. The regulatory treatment of one and the other is distinct, although the two are growing closer over time. Regulation of medicines generally requires clinical trials that prove that the drug being tested is effective in its intended purpose and that it isn’t harmful to one’s health.

In the case of food, and more so in Europe, the exact benefit of the ingredient has to be proved in order to indicate that this food is beneficial to one’s health. In the case of probiotics, it is a little more complex to identify a single bacterium with a single outcome, although its presence may benefit the diversity of the microbiome overall.

In fact, since 2010, when the EFSA regulated against the claims used by the yogurt industry about the health benefits of their products, all of these probiotic products suffered a huge fall in sales from which they still haven’t recovered. This study does not aim to question the current regulation, but it is clear that there lacks a better understanding between both parties so that many consumers, as well as the industry, can benefit from this new category of functional products with great potential in a transparent and rigorous way.

Annual growth of probiotic yogurt sales



Source: Euromonitor

Transparency

As it is in all categories, there are better and worse players, and for this reason it is very important to be transparent with names and descriptions and the use and definition of certain terms that are still unknown to some.

With this in mind, we would like to highlight that there are currently fermented products on the market in categories like kefir and kombucha, which are not probiotics in a strict sense, although they benefit surreptitiously from being associated with them. In other words, there are kombuchas that don't contain active cultures or that are pasteurized, and for this reason they are not probiotics, just like there are kefirs that don't contain live bacteria. Some brands are pasteurized or are made not from a SCOBY, but from added bacteria. These inconsistencies make it complicated to name all products in the same manner, although it's quite easy to determine a fake. In order to identify an authentic and live kombucha or kefir, a consumer can simply leave their product out and see if a new SCOBY or kefir culture emerges over time.

With respect to fermented vegetables, a large part of the kimchi and sauerkraut that is sold in Europe is pasteurized, and thus deprived of all of its functional properties upon eliminating the bacterial flora that it once contained. In this respect, there is still no regulation that differentiates between live and pasteurized versions of these products.

In light of the abuse that can occure with the term "probiotic" by some manufacturers, the ISAPP has proposed a three-scaled classification: foods with live organisms, those that also contain probiotics, and finally, those that have probiotics with some therapeutic property (once they are scientifically proven).

It's important that the consumer is aware of when they are consuming a product with probiotic properties and when they are not, beyond the regulations of the EFSA and whether the term itself is approved in its labeling. If the category isn't regulated and the market is inundated with products that aren't loyal to the original spirit of fermentation, we will have missed a truly significant opportunity.

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