

AUGUST 2026

2ND ISSUE

GUT- AUGUST

PROBIOTIC EDITION

FERMENTED FOODS

Traditional remedies for
digestion , detox, & balance

FEED YOUR GOOD BACTERIA

Foods; habits & natural ways to
nourish your microbiome



Healthy Living from Nature

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Editor's note

Gut health has slowly become the foundation upon which we view general body wellness. We have made it our sole mandate to educate you about the need for a better approach to health, one that is not focused on choosing health care products from pharmacies, rather it is one that is focused on intentional living and making the right choices when it comes to the food you eat, the water you drink and whatever you choose not to consume. I have dedicated my time to seminars, webinars, and a whole masterclass on detox and gut health where I have raised the seriousness of this issue.



RECAP OF GUT- AUGUST 1.0

The first edition of GUT-AUGUST featured seminars across all our branches in which Dr. Spice alongside other health educators/enthusiasts educated people from all over the country on taking care of their gut. In Ruiru and Eldoret we had the pleasure of hosting Dr. Angela Muthoni of Lifestyle and Health.

We got serious feedback from attendees. One in Eldoret, whose story has been shared on YouTube at <https://www.youtube.com/watch?v=izB-UB7ALJO> told us how the Dr. Spice gut Package has been beneficial to him. Previously, he had an appetite problem, but at the time of the seminar, he claimed to be taking sufficient meals without an iota of trouble. Another one still in Eldoret, told us how he avoided going for a cornea transplant surgery using purely herbs. He revealed that doctors had prescribed the surgery and claimed that the procedure was the only way to prevent loss of vision. Later the doctors were surprised to see him without his spectacles and wondered if he was wearing contact lenses, only to find that he was perfectly fine, with his eyesight working perfectly.

Right now we invite you to our August-long seminars that will be in a town near you. call our Numbers displayed at the back of this issue and tell us where you want us to come to continue with this education on Gut health.



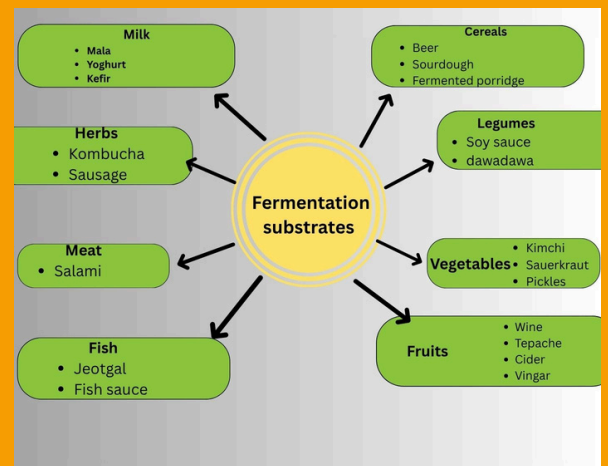
UNDERSTANDING FERMENTATION

Fermentation is responsible for many of the foods we enjoy around the world today, such as yogurt, kefir, sourdough bread, sauerkraut, kimchi, cheese, kombucha, tempeh, and fermented beverages. Each of these foods relies on specific microorganisms working under the right conditions to transform ordinary ingredients into something entirely new. Rather than causing food spoilage, these microorganisms create an environment that discourages the growth of harmful microorganisms. This natural preservation method is what we have used safely for thousands of years across cultures and continues to be valued for both its culinary and health benefits.



UNDERSTANDING FERMENTATION

This evidence was discovered by analysing the stone mortars from the Natufian burial sites of a semi-sedentary foraging population, in which beer was brewed from cereals. This means that even before scientists could describe microorganisms, certain traditional practices already consistently produced foods that remained safe to eat and often became more valuable than raw ingredients from which they were made using the fermentation process.



THE SCIENCE BEHIND FERMENTATION

At face value, we see fermentation as a preservation method, or getting an acidic taste from foods and drinks which we often term as “kuchacha” referring to the sour or umami taste that food and beverages develop after fermenting. But, at the microscopic level, fermentation is a remarkable collaboration between human action and microorganisms. Fresh fruits, vegetables, grains, milk, and other foods naturally contain sugars and starches that serve as food for microbes. When conditions such as temperature, moisture, salt concentrations, and oxygen levels are suitable, beneficial microorganisms begin to multiply, and consume these sugars, they produce compounds that change the food in important ways;



One of the most important concepts in fermentation is pH. As beneficial bacteria produce organic acids, the food becomes more acidic, and since most disease-causing microorganisms cannot grow well in acidic environments, thus making properly fermented foods are naturally safer and more stable.

- Lactic acid bacteria produce lactic acid, lowering pH and creating an acidic environment that prevents many harmful bacteria from surviving.
- Yeast converts sugars into alcohol and carbon dioxide, giving rise to products such as sourdough bread, beer, wine, and certain traditional beverages
- Acetic acid bacteria convert alcohol into acetic acid, producing vinegar.
- Some beneficial moulds produce enzymes that break down proteins and fats, contributing to the flavor and texture of foods such as certain cheeses and fermented soy products.
-



Lactic acid bacteria(LAB)

Lactic acid bacteria are naturally found on vegetables, grains, dairy products, and even on our skin and digestive tract. Common genera include *Lactobacillus*, *Lactocaseibacillus*, *Lactococcus*, *Leuconostoc*, *Pedococcus*, and *Weissella*. These bacteria convert sugars into lactic acid, creating the acidic conditions needed to preserve foods like sauerkraut, kimchi, yogurt, fermented vegetables, and many of our traditional African fermented foods. Lactic acid bacteria naturally preserve food, produce pleasant sour flavors, improve texture, help break down complex carbohydrates, and can increase the availability of certain vitamins and minerals.



Yeast

Yeast is a single-celled fungus that is used in food production, with the best-known species being *Saccharomyces cerevisiae*, often called baker's or brewer's yeast. Yeasts convert sugars into;

- Carbon dioxide, which makes bread rise
- Alcohol, which forms the basis of beers and wines
- Flavor compounds that contribute fruity, floral, and earthy notes

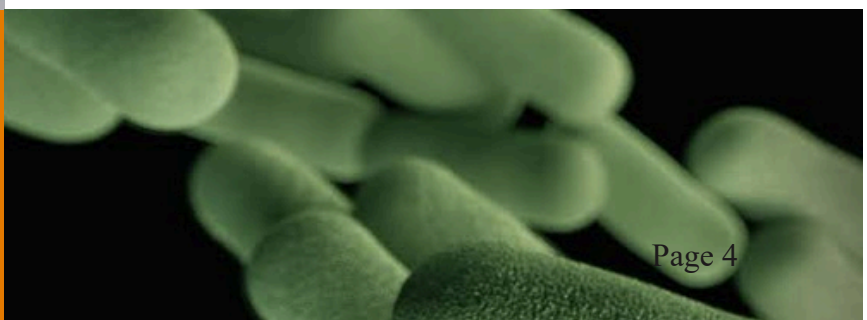
Acetic acid bacteria

These bacteria thrive in the presence of oxygen and convert alcohol into acetic acid, the main component of vinegar. Species belonging to the genera *Acetobacter* and *Komagataeibacter* are especially important in vinegar and kombucha fermentation. Besides producing acidity, some species also produce the cellulose mat, often called the 'mother' or SCOBY, used in vinegar or kombucha production.

Although molds are often associated with food spoilage, several species are intentionally used in fermentation, such as;

- *Aspergillus oryzae*, used to make soy sauce
- *Penicillium roqueforti* and *Penicillium camemberti* are used in blue cheeses and soft cheeses

Beneficial molds





THE FOUR PILLARS OF SUCCESSFUL FERMENTATION

Successful fermentation is achieved by creating an environment where beneficial microorganisms thrive while harmful ones are kept under control. Although different foods require different techniques, every successful fermentation depends on four key factors: salt, temperature, oxygen, and time. When these four elements are properly managed, fermentation becomes predictable, safe, and rewarding.



SALT



Salt creates conditions that flavor beneficial lactic acid bacteria while slowing or preventing the growth of many spoilage organisms and pathogens.

It also helps vegetables retain their crisp texture by slowing the activity of enzymes that soften plant tissues. The amount of salt is important. Too little allows undesirable microorganisms to grow before the beneficial bacteria become established. Too much salt can slow fermentation so much that the desired bacteria .

struggle to multiply. For most vegetable fermentation, a salt concentration of 2-3% by weight provides an excellent balance between safety, flavor, and fermentation speed.

Salt is one of the most important ingredients in many vegetable fermentations; its role goes far beyond adding flavor. When vegetables are salted, water is drawn out of their cells through osmosis. This liquid combines with the salt to form a natural brine that surrounds the vegetables.



TEMPERATURE

Microorganisms are living organisms, and like all living things, they perform best within certain temperature ranges. If fermentation is too cold, microbial activity slows down dramatically. Fermentation may still occur, but it can take much longer. If the temperature is too high, fermentation proceeds too quickly. This can result in overly soft vegetables, unbalanced flavours, or conditions that promote the growth of unwanted microorganisms. For most lactic acid fermentations, the ideal temperature is between 18°C and 24°C. Once fermentation reaches the desired flavour, refrigeration greatly slows microbial activity, allowing the food to be stored for weeks or months.

TIME

When vegetables are first packed into a fermentation vessel, many different microorganisms are present. Over time, beneficial bacteria multiply and gradually dominate the environment by producing lactic acid. Early in fermentation, flavours are mild and fresh. As days pass, acidity increases, flavours become deeper and more complex, and textures gradually soften. Every ferment has its own timeline; quick cucumber pickles may be ready in a few days, while miso and soy sauce may ferment for many months or even years.

OXYGEN

Some beneficial microbes need oxygen, while others thrive without it. Most vegetable fermentations depend on lactic acid bacteria, which thrive in low-oxygen environments. Keeping vegetables completely submerged beneath the brine prevents oxygen-loving molds and yeasts from growing on the surface. This is why fermentation weights, follower leaves, and airlock lids are commonly used. However, not every fermentation is oxygen-free; vinegar production requires oxygen because acetic bacteria convert alcohol into vinegar only in the presence of air, and kombucha requires oxygen for the SCOBY to function properly.

01. Salt



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03. Oxygen



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Time 04.





RECOGNIZING A HEALTHY FERMENT

Many people worry that something has gone wrong when they notice changes during fermentation. In reality, many of these changes are normal and signs of a healthy ferment. Such signs include:

- Small bubbles rising through the brine
- A pleasantly sour or tangy aroma
- Cloudy brine caused by active bacteria
- A gradual increase in acidity
- Vegetables remaining submerged in the liquid

Although fermentation is usually a forgiving process, occasionally a batch should be discarded, especially if it exhibits the following signs;

- Fuzzy mold that is black, pink, orange or green
- A foul, rotten or putrid smell
- Sliminess that is excessive and accompanied by unpleasant odours
- Signs of insect contamination





BENEFITS OF FERMENTATION

While fermentation has long been valued for preserving food and enhancing flavour, modern research has shown that the process also changes food at the biochemical level. Rather than simply preserving the nutrients already present in food, fermentation often transforms them into forms that are easier for the body to utilize and absorb. At the same time, beneficial microorganisms produce enzymes and bioactive compounds that contribute to the overall nutritional value of fermented foods.

Enhancing nutrient bioavailability

Many plant foods contain valuable nutrients that aren't always easily absorbed by the body. Minerals such as zinc, iron, calcium, and magnesium may be present, but plant compounds can bind to them, limiting their absorption. During fermentation, beneficial microorganisms produce enzymes that break down complex food components and release nutrients from their bound forms. This process allows the body to absorb and utilize more of the nutrients already present in food. This makes fermentation particularly valuable in communities where plant-based foods make up a large proportion of the diet.

Production of beneficial bioactive compounds

Many lactic acid bacteria and other fermenting microorganisms are capable of synthesising a group of vitamins known as the B group vitamins, including folate (B9), which is used to make red blood cells and cell growth, riboflavin (vitamin B2), which our body uses to convert food into cellular energy, and, in some cases, vitamin B12, depending on microbial species involved. Certain fermented foods are also important sources of vitamin K, particularly vitamin K2 (menaquinone), which plays an essential role in blood clotting and bone health. In addition to vitamins, fermentation produces a wide range of other beneficial compounds for our bodies, including;

- ▶ Digestive enzymes that help break down carbohydrates, proteins and fats
- ▶ Organic acids, such as lactic acid and acetic acid, which support our digestive system
- ▶ Bioactive peptides, some of which have been associated with antioxidant, antimicrobial, and blood pressure-regulating properties.
- ▶ Natural antioxidants that help protect our cells from oxidative stress

Reducing anti-nutritional factors

Many grains, legumes, seeds, and vegetables naturally contain substances known as anti-nutritional factors. These compounds are part of plants' natural defense system, but can reduce our body's ability to digest food or absorb important nutrients. During fermentation, microorganisms produce enzymes such as phytase, which breaks down phytates and reduces their ability to bind minerals like zinc, iron, calcium, and magnesium in our bodies. Other microbial enzymes help degrade tannins and prevent enzyme inhibitors from interfering with our body's ability to properly digest proteins. This is one of the reasons why traditionally fermented foods made from cereals and legumes are often considered more digestible than their unfermented counterparts.





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Natural Partnership Between Food and Microbes

Fermentation demonstrates how beneficial microorganisms can transform ordinary ingredients into foods that are not only more flavourful but also more nutritious and longer-lasting. By producing vitamins, enzymes, organic acids, and other health-promoting compounds for our bodies, fermentation enhances the nutritional quality of food, improves digestibility, increases mineral absorption, supports gut health, and reduces food waste.

These remarkable transformations explain why fermented foods have remained an essential part of our traditional diets for thousands of years and why they continue to be valued in modern nutrition and sustainable food systems

Supporting a healthy gut microbiome

Our digestive tract is home to trillions of microorganisms collectively known as the gut microbiome, which play a vital role in digestion, nutrient metabolism, immune function and overall health. Many fermented foods contain live beneficial microorganisms that can contribute to the diversity of microbes consumed in our diet. Although not every fermented food contains probiotic strains, regular consumption of fermented foods may help support a healthy ecosystem by introducing beneficial bacteria and providing compounds that nourish our existing gut microbes. Fermentation also produces organic acids and other metabolites that create favourable conditions for beneficial intestinal bacteria while discouraging the growth of harmful microorganisms. A diverse and balanced gut microbiome has been associated with improved digestion, better nutrient absorption, enhanced immune function, reduced risk of gastrointestinal disturbances and our overall metabolic health.

Preserving food and reducing waste

One of fermentation's oldest and most practical benefits is its ability to naturally preserve food. As beneficial microorganisms convert sugars into organic acids and other antimicrobial compounds, they create conditions that inhibit spoilage organisms and many foodborne pathogens. This natural preservation extends the shelf life of foods without relying on artificial preservatives. Historically, fermentation enabled us to preserve seasonal harvests for consumption during periods of scarcity. Today, it continues to play an important role in reducing food loss and waste by allowing surplus fruits, vegetables, grains, and dairy products to be safely stored for much longer than they would remain fresh.





FERMENTED FOODS ACROSS THE WORLD

“Fermentation is one of the oldest methods of food preservation. Long before refrigeration, people discovered that allowing beneficial microorganisms to transform food not only extended its shelf life but also improved its taste, texture, nutritional value, and digestibility. Today, fermented foods are enjoyed in nearly every part of the world and represent an important part of cultural identity and traditional knowledge. This chapter explores some of the world's best-known fermented foods and beverages, highlighting their origins, traditional preparation methods, cultural significance, and the communities that continue to preserve these traditions.”



SAUERKRAUT

HISTORY

Sauerkraut is one of Europe's oldest fermented foods. Although many people associate it with Germany, historians believe the practice of fermenting cabbage began over 2,000 years ago in ancient China. Laborers building the Great Wall of China preserved cabbage by fermenting it in rice wine. The fermentation technique later spread westward through trade routes into Eastern Europe and eventually Germany, where it became a staple food. Today, Germany, Poland, Austria, and parts of Eastern Europe remain major consumers of sauerkraut.

Major bacteria include:

- *Leuconostoc mesenteroides*
- *Lactiplantibacillus plantarum*
- *Levilactobacillus brevis*

BENEFITS OF SAUERKRAUT



Sauerkraut

Sauerkraut is much more than preserved cabbage. Through lactic fermentation, it becomes a highly nutritious food with several health and practical benefits.

1. Rich in Vitamin C

Sauerkraut is an excellent source of vitamin C, an essential nutrient that supports the immune system, helps the body produce collagen for healthy skin and tissues, promotes wound healing, and improves the absorption of iron from plant-based foods. Historically, sailors carried sauerkraut on long sea voyages because its vitamin C content helped prevent scurvy, a disease caused by vitamin C deficiency. Although some vitamin C is lost during fermentation, properly fermented and unpasteurized sauerkraut still provides significant amounts of this important vitamin

2. Good source of probiotics

One of sauerkraut's greatest health benefits is its abundance of beneficial probiotic bacteria, particularly species of *Lactobacillus*. These live microorganisms are produced naturally during fermentation and help maintain a healthy balance of gut microbiota. A healthy gut microbiome contributes to improved digestion, stronger immune function, better nutrient absorption, and may even influence mental health through the gut-brain axis. It is important to note that raw, unpasteurized sauerkraut contains the highest levels of live probiotics, whereas pasteurized products may have greatly reduced probiotic activity.

3. Easy to Digest

Fermentation partially breaks down the cabbage's natural sugars and fibers, making sauerkraut easier to digest than fresh cabbage for many people. Beneficial bacteria also produce enzymes that aid in the digestion of carbohydrates and other nutrients. This process can reduce the compounds responsible for gas production, allowing some individuals to tolerate fermented cabbage better than raw cabbage. Additionally, fermentation increases the bioavailability of certain vitamins and minerals, enabling the body to absorb nutrients more efficiently.

KIMCHI

HISTORY



Kimchi is one of Korea's oldest and most important traditional foods, with a history that stretches back more than 2,000 years. It originated as a practical way to preserve vegetables during the harsh Korean winters, when fresh produce was scarce. Ancient Koreans discovered that salting vegetables slowed spoilage, allowing them to store food for months while also enhancing its flavor and nutritional value. The earliest forms of kimchi were quite

salted vegetables, such as cabbage, radish, cucumber, and other seasonal produce. These vegetables were preserved with salt and sometimes flavored with garlic, ginger, or wild herbs. Unlike modern kimchi, these early versions were not spicy because chili peppers had not yet reached Korea.

BENEFITS OF KIMCHI



Kimchi is widely recognized as one of the healthiest fermented foods because it combines the nutritional value of vegetables with the health-promoting effects of fermentation. Regular consumption of kimchi, as part of a balanced diet, may support digestive health, immunity, and overall well-being.

2. Rich in Probiotics

Kimchi is naturally fermented by beneficial bacteria, mainly lactic acid bacteria such as *Lactobacillus*, *Leuconostoc*, and *Weissella* species. These probiotic microorganisms help maintain a healthy balance of gut bacteria by: Improving digestion and nutrient absorption.

- Reducing the growth of harmful bacteria in the intestines.
- Supporting the immune system function, as much of the body's immune system is associated with the gut.
- Helping relieve digestive problems such as constipation and diarrhea.
- Potentially reducing inflammation and improving overall gut health.

3. High in Dietary Fiber

Kimchi is naturally rich in dietary fiber because it is made primarily from vegetables.

Dietary fiber provides several health benefits:

- Promotes regular bowel movements.
- Helps prevent constipation.
- Supports healthy gut bacteria by acting as a prebiotic.
- Helps control blood sugar levels by slowing glucose absorption.
- Increases the feelings of being full, which may help with weight management.
- Lower cholesterol levels and reduce the risk of cardiovascular disease.

4. Rich in Antioxidants

Kimchi contains numerous natural antioxidants from ingredients such as garlic, ginger, chili peppers, onions, and cabbage.

1. Good source of Vitamins A, C, and K

Kimchi contains several essential vitamins because it is made from nutrient-rich vegetables such as napa cabbage, radishes, garlic, spring onions, and chili peppers.

Vitamin A

- Supports healthy vision.
- Maintain healthy skin and mucous membranes.
- Strengthens the immune system .
- Acts as an antioxidant, protecting body cells.

Vitamin C

- Helps boost the immune system by strengthening the white blood cells.
- Promotes wound healing by boosting collagen production and fighting cell damage.
- Aids in collagen production for healthy skin, bones, and blood vessels.
- Improves the absorption of iron from plant foods.
- Protects cells from oxidative damage.

Vitamin K

- Essential for normal blood clotting.
- Helps maintain strong, healthy bones.
- May reduce the risk of bone fractures by supporting bone mineralization.

KEFIR

History of Kefir

Kefir is one of the world's oldest fermented milk beverages, with a history that stretches back more than a thousand years. It originated in the Caucasus Mountains, a mountainous region between the Black and Caspian Seas. The region's cool climate and livestock-based lifestyle made it an ideal place for the development of fermented dairy foods. The word "kefir" is believed to come from the Turkish word "keyif," meaning good feeling or pleasant sensation, referring to the sense of well-being experienced after drinking the beverage. Kefir was traditionally prepared by adding kefir grains, a unique combination of beneficial bacteria and yeasts, to fresh milk from cows, goats, or sheep.

Benefits of Kefir

Kefir is one of the most nutritious fermented dairy products, offering a combination of beneficial microorganisms and essential nutrients that support overall health. Regular consumption of kefir has been associated with improvements in digestive health, immune function, bone health, and nutritious status.

1.

Live Probiotics

Kefir is rich in live probiotic microorganisms, including beneficial bacteria such as Lactobacillus, Lactococcus, Leuconostoc, and beneficial yeasts. Unlike many yogurts that contain only a few bacterial strains, kefir may contain 30- 60 different species of bacteria and yeasts, making it one of the most diverse probiotic foods.

2.

Protein

Kefir is an excellent source of high-quality protein, containing all the essential amino acids required by the human body.



Benefits of Kefir

3. Calcium

Kefir is naturally rich in calcium, one of the most important minerals for maintaining healthy bones and teeth. Fermentation may also improve calcium absorption by making minerals more bioavailable.

4. Vitamin B12

Vitamin B12 plays an important role in:

- Formation of healthy red blood cells, helping prevent certain types of anemia.
- Normal function of the brain and nervous system.
- DNA synthesis and cell division.
- Energy metabolism by helping convert food into usable energy.
- Supporting memory, concentration, and cognitive function.

KOMBUCHA

FERMENTED TEA

The History of Kombucha

Kombucha is a traditional fermented tea beverage believed to have originated in Northeast China (Manchuria) more than 2,000 years ago, during the Qin Dynasty. It was highly valued because it was believed to promote vitality, improve digestion, and support longevity. Historical records describe it as the "Tea of Immortality" due to its perceived health-promoting properties. From China, kombucha spread to Japan, where legend suggests that a Korean physician named Kombu introduced the beverage to Emperor Ingyō, giving rise to the name "kombucha." Although the exact origin of the name remains debated, the belief gradually spread across East Asia. Today, kombucha is consumed worldwide and is one of the fastest-growing functional beverages because of its probiotic potential, unique flavor, and perceived health benefits.

Health Benefits of Kombucha

During fermentation, beneficial microorganisms produce organic acids, vitamins, enzymes, and other bioactive compounds that may contribute to health



BENEFITS OF KOMBUCHA

1. Supports Gut Health

Kombucha contains a variety of beneficial microorganisms, including *Lactobacillus acidophilus*, *Acetobacter*, and yeasts. These microorganisms may help maintain a healthy balance of the gut microbiota, which is important for digestion, nutrient absorption, and immune function. A healthy gut microbiome is also associated with reduced gastrointestinal disorders and improved overall well-being. Additionally, organic acids produced during fermentation, such as acetic acid and gluconic acid, may inhibit harmful bacteria while supporting beneficial microbes.



2. Rich in Probiotics

When kombucha is unpasteurized, it contains live probiotic microorganisms that can help replenish beneficial bacteria in the digestive tract.

3. Powerful Source of Antioxidants

Kombucha retains many of the antioxidants naturally present in tea, while fermentation can increase the availability of certain antioxidant compounds.

4. Weight Management

Although kombucha is not a weight loss beverage, it may contribute to healthy weight management when consumed as part of a balanced diet.

5. Improve Liver Health

Animal studies suggest that kombucha may help protect the liver against oxidative stress and toxin-induced damage.

7. Strengthens Bones

Kombucha prepared from green tea has shown potential to improve blood glucose regulation.

6. Supports Immune Function

Approximately 70% of immune cells are associated with the gastrointestinal tract. By supporting a healthy gut microbiome, kombucha may indirectly strengthen immune function.



BENEFITS KOMBUCHA

8. Possesses Antimicrobial Activity

The organic acids produced during fermentation, particularly acetic acid, create an acidic environment that inhibits many pathogenic microorganisms.



9. Supports Weight Management

Kombucha contains tea polyphenols that promote cardiovascular health by improving lipid metabolism.

10. Powerful Source of Antioxidants

Although kombucha is not a weight loss beverage, it may contribute to healthy weight management when consumed as part of a balanced diet.

10. Powerful Source of Antioxidants

During fermentation, kombucha contains a variety of nutrients and bioactive compounds, including:

- B-complex vitamins
- Vitamin C
- Organic acids
- Polyphenols
- Flavonoids
- Amino acids
- Glucuronic acid
- Gluconic acid
- Minerals such as manganese

11. Provides Vitamins and Bioactive Compounds

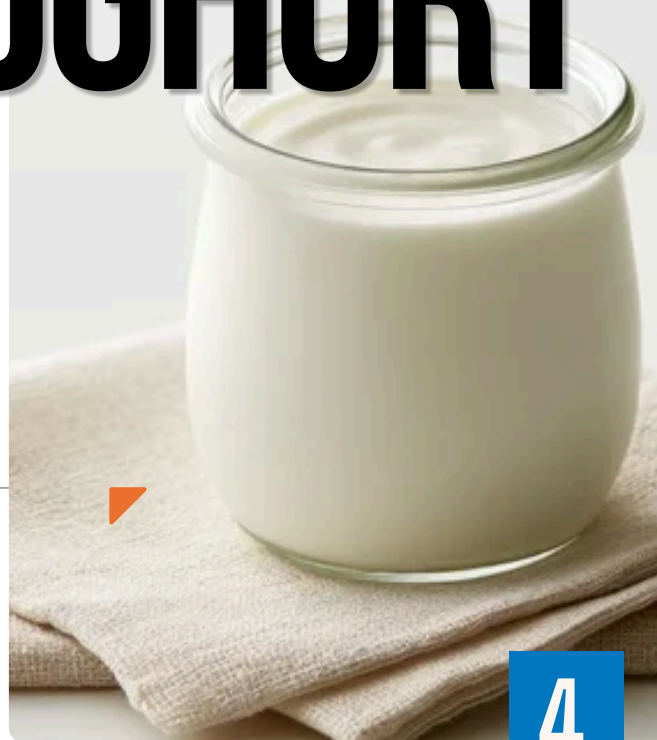
The organic acids produced during fermentation, particularly acetic acid, create an acidic environment that inhibits many pathogenic microorganisms.



HISTORY

YOGHURT

Yoghurt is one of the oldest fermented dairy products in the world, with evidence suggesting that it has been consumed for at least 5,000 years, and possibly much longer. It is believed to have originated among nomadic pastoral communities in Central Asia and the Middle East, where people depended heavily on domesticated animals. Today, yoghurt is produced globally using standardized fermentation methods while maintaining many traditional practices passed down through generations.



Benefits of Yogurt

1. Improves Gut Health

Yoghurt contains live beneficial microorganisms (probiotics) that help maintain a healthy balance of the gut microbiota. These probiotics support digestion, inhibit the growth of harmful bacteria, and promote a healthy intestine environment.

Enhances Digestive Health

The fermentation process breaks down lactose into lactic acid, making yoghurt easier to digest than fresh milk, especially for individuals with lactose intolerance.

2.



3. Strengthens Bones

Yogurt is an excellent source of minerals such as calcium, phosphorus, and magnesium. These nutrients work together to increase bone mineral density, reduce the risk of osteoporosis, and promote healthy teeth.

4.

Supports Immunity

Probiotics in yogurt help regulate immune responses by interacting with immune cells in the gut, where much of the body's immune system resides.

5.

High-Quality Protein

Yogurt is rich in complete proteins containing all essential amino acids. Protein helps:

- Build and repair muscles.
- Maintain healthy skin and tissues.
- Support enzyme and hormone production.

6.

Weight Management

Yogurt may assist with healthy weight management through several mechanisms:

- High protein content increases satiety.
- Calcium may influence fat metabolism.
- Probiotics may improve metabolic health.

7.

regulate blood sugar

Plain yogurt has a relatively low glycemic index and can help stabilize blood glucose levels through:

- Improved insulin sensitivity.
- Slower digestion due to protein content.
- Better post-meal blood sugar control.
- Reduced risk of developing type 2 diabetes when taken daily

BUSAA

CEREAL-BASED FERMENTED PROBIOTIC DRINK



Busaa

History of Busaa

Busaa is one of Kenya's oldest traditional fermented beverages and has been prepared and consumed for centuries by many indigenous communities. Its origins can be traced to traditional agricultural societies that cultivated cereal crops such as sorghum and millet, which were well adapted to Kenya's diverse climatic conditions. Long before the introduction of commercially produced alcoholic beverages, Busaa served as a nutritious fermented drink that provided both energy and hydration. The beverage was traditionally produced using simple household methods, relying on naturally occurring microorganisms present on cereal grains, water, and fermentation vessels. Historically, Busaa was more than just a beverage; it played an important role in strengthening social relationships, preserving cultural identity, and celebrating communal achievements.



Today, although commercial alcoholic beverages are widely available, Busaa continues to be brewed in many rural areas and is increasingly recognized as part of Kenya's rich cultural heritage.

Health Benefits of Busaa

When traditionally prepared under hygienic conditions and consumed in moderation, Busaa provides several nutritional and health benefits due to the fermentation process and the nutrients present in cereal grains.

1. Source of Beneficial Microorganisms

Freshly fermented Busaa contains lactic acid bacteria (LAB) and yeasts that contribute to the beverage's fermentation. Although Busaa is not considered a standardized probiotic food because its microbial composition varies, these microorganisms may help support a balanced intestinal microbiota, improve digestion, and inhibit the growth of harmful bacteria through the production of lactic acid and other antimicrobial compounds.

2. Source of Beneficial Microorganisms

Improved Digestibility

Fermentation breaks down complex carbohydrates and partially digests proteins, making nutrients easier for the body to absorb. The process also reduces certain antinutritional compounds, such as phytates and tannins, which can interfere with the absorption of minerals like iron, zinc, and calcium. As a result, fermented cereals are generally easier to digest than their unfermented counterparts.

3. Rich Source of Energy

Because Busaa is prepared from cereal grains such as millet, sorghum, and maize, it provides carbohydrates that serve as an important source of energy.

Traditionally, it has been consumed by farmers and manual laborers to replenish energy after physically demanding work.

Busaa

History of Busaa



4. Provides Essential Nutrients

Busaa retains many nutrients naturally present in cereal grains, including:

- Complex carbohydrates
- Dietary fiber
- Plant proteins
- B-complex vitamins
- Minerals such as iron, magnesium, phosphorus, potassium, and zinc

5. Increased B-Vitamin Content

Lactic acid bacteria and yeasts involved in fermentation are capable of synthesizing certain B vitamins, including folate and other B-complex vitamins. These vitamins support energy metabolism, nervous system function, and the production of healthy red blood cells.

6. Supports Gut Health

The organic acids produced during fermentation, particularly lactic acid, create an acidic environment that discourages the growth of harmful microorganisms while promoting beneficial bacteria. This may contribute to improved gastrointestinal health and help maintain a healthy intestinal environment.

7. Antioxidant Activity

Sorghum and millet contain natural phenolic compounds, flavonoids, and other antioxidants. Fermentation may increase the availability of these bioactive compounds, helping neutralize free radicals and reduce oxidative stress. Antioxidants are associated with a lower risk of chronic diseases, including cardiovascular disease and certain metabolic disorders.

8. Source of Beneficial Micro organisms

Freshly fermented Busaa contains lactic acid bacteria (LAB) and yeasts that contribute to the beverage's fermentation. Although Busaa is not considered a standardized probiotic food because its microbial composition varies, these microorganisms may help support a balanced intestinal microbiota, improve digestion, and inhibit the growth of harmful bacteria through the production of lactic acid and other antimicrobial compounds.

9. Cultural and Social Well-being

Beyond its nutritional value, Busaa contributes to social cohesion and mental well-being by fostering community interaction during traditional ceremonies, celebrations, and communal gatherings.

MURSIK

History

Mursik is the traditional fermented milk of the Kalenjin community in Kenya and has been prepared for generations as an important part of their cultural heritage. It is commonly served during ceremonies such as weddings, initiation rites, and community gatherings, symbolizing hospitality, unity, and respect. One of its most distinctive characteristics is the use of a specially prepared calabash (gourd) that is smoked using the wood of specific trees, traditionally the African olive (*Olea africana*). The smoking process imparts a unique smoky flavor, helps preserve the milk, and gives Mursik its characteristic grey color.



Benefits of Mursik

- **Rich in probiotics:** The fermentation process produces beneficial bacteria that promote a healthy gut microbiome, improve digestion, and support overall digestive health.
- **Excellent source of calcium:** Calcium strengthens bones and teeth and helps reduce the risk of osteoporosis.
- **High-quality protein:** Mursik supplies essential amino acids needed for muscle growth, tissue repair, and body maintenance.
- **Supports the immune system:** Beneficial microorganisms and nutrients may help enhance immune function and reduce the risk of certain infections.
- **Improves lactose digestion:** Fermentation reduces the lactose content, making Mursik easier to digest for some people with mild lactose intolerance.
- **Provides essential vitamins and minerals:** It contains vitamins such as vitamin B12 and riboflavin (B2), as well as minerals including phosphorus and potassium, which support energy production, nerve function, and overall health.

MURATINA

History of Muratina

Muratina is a traditional fermented beverage of the Kikuyu people of Kenya, with a history that dates back many generations. It is prepared using honey, water, and the fruit of the *Kigelia Africana* (sausage tree). Traditionally, the drink was brewed in clay pots or gourds and allowed to ferment for several days before consumption. Muratina has long been valued not only as a refreshing beverage but also as a symbol of hospitality, unity, and cultural identity.



- **Natural probiotics:** Fermentation encourages the growth of beneficial microorganisms that may support a healthy digestive system.

- **Rich in antioxidants:** Honey contains natural antioxidant compounds that help protect the body's cells from oxidative stress.
- **Provides energy:** The natural sugars in honey supply carbohydrates that serve as a quick source of energy.

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HEALTH BENEFITS OF MURATINA

- **Source of minerals:** Honey contributes small amounts of minerals such as potassium, calcium, magnesium, and iron, which support normal body function's.
- **Support immune health:** Honey has natural antimicrobial properties and has traditionally been used to help soothe sore throats and support the body's natural defenses.
- **Improved digestibility:** Fermentation can break down some compounds, making certain nutrients easier for the body to absorb.

MNAZI

History of Mnazi

Mnazi is a traditional fermented coconut palm sap beverage that has been consumed for centuries along the East African coast, particularly in Kenya and Tanzania. It is made by tapping the flowering stalk of mature coconut palm trees to collect the naturally sweet sap. Fresh sap begins to ferment within a few hours due to naturally occurring wild yeasts and bacteria, gradually developing a mildly alcoholic taste. Historically, Mnazi has played an important role in the social, cultural, and economic life of coastal communities. where it is commonly shared during celebrations, weddings, community gatherings, and traditional ceremonies.

HEALTH BENEFITS OF MNAZI



- Provides natural sugars that supply quick energy.
- Contains small amounts of vitamin C, which supports immune function.
- Provide B vitamins formed during fermentation that contribute to energy metabolism.
- Contains essential minerals such as potassium, magnesium, calcium, and iron, which support normal muscle, nerve, and bone function.



- Fresh Mnazi contains naturally occurring probiotic microorganism that may help support a healthy digestive system.
- Supplies antioxidants that help protect the body's cells from oxidative stress.
- Helps maintain hydration because the fresh sap contains a high water content.

FERMENTED CASSAVA PRODUCTS

Cassava fermentation is widely practiced across Africa and produces a variety of traditional foods that differ in processing methods, texture, flavor, and culinary uses. These products are not only important staples but also contribute to food security, cultural heritage, and rural livelihoods.

▼ *Gari and Fufu (Nigeria Ghana, Benin, Togo)*

Gari is one of the most popular fermented cassava products in West Africa. It is made by peeling, washing, grating, and fermenting cassava roots for 2-5 days. The fermented mash is then pressed to remove excess water and roasted in large pans to produce dry, coarse granules.

Fufu is a soft, elastic dough prepared from fermented cassava, sometimes blended with plantain or yam. Cassava roots are soaked in water for several days until fermentation softens the roots. The softened Cassava is then sieved, cooked, and pounded or stirred into a smooth paste.

Attieké (Côte d'Ivoire)

Attieké is a traditional fermented cassava product that resembles couscous. It is produced by grating cassava, fermenting it with a starter culture, pressing out excess moisture, granulating the mash, and steaming it.



Chikwangue (Central Africa)

Chikwangue, also known as kwanga, is a fermented cassava paste widely consumed in the Democratic Republic of Congo, Republic of Congo, and neighboring countries.

Cassava is fermented for several days, ground into a smooth paste, wrapped in banana or other leaves, and steamed.



OVERALL IMPORTANCE OF FERMENTED CASSAVA PRODUCTS



Fermented cassava products play a vital role in nutrition, food preservation, and public health across Africa. Their fermentation process:

- Reduces toxic cyanogenic glycosides to safe levels.
- Improves digestibility and nutrient absorption.
- Enhances flavor, aroma, and texture.
- Extends shelf life by inhibiting spoilage microorganisms.
- Improves food safety by reducing the growth of harmful bacteria.
- Supports gut health through beneficial fermentation microorganisms and metabolites





Traditional African Fermented Porridges

Traditional fermented porridges are widely consumed throughout Africa and are prepared from cereals such as maize, sorghum, finger millet, pearl millet, and occasionally cassava. Fermentation is usually spontaneous, relying on naturally occurring lactic acid bacteria and yeasts, although some communities use a portion of previously fermented porridge as a starter culture. Fermentation enhances flavor, extends shelf life, improves digestibility, reduces anti-nutritional factors such as phytates, and increases the bioavailability of minerals such as iron, zinc, and calcium. Traditional fermented porridges can be grouped into two categories based on whether they are cooked after fermentation or consumed without further heating after fermentation.

Fermented Porridges Cooked After Fermentation

In these products, the cereal slurry or dough is first fermented and then cooked by boiling. Cooking destroyed most of the living microorganisms but retains the nutritional improvements brought about by fermentation.

- Uji (Kenya, Tanzania, Uganda)
- Ogi (Nigeria, Ghana, Benin)
- Tiing (South Africa, Botswana)
- Ben-Saalga (Burkina Faso)

Advantages of Cooking After Fermentation

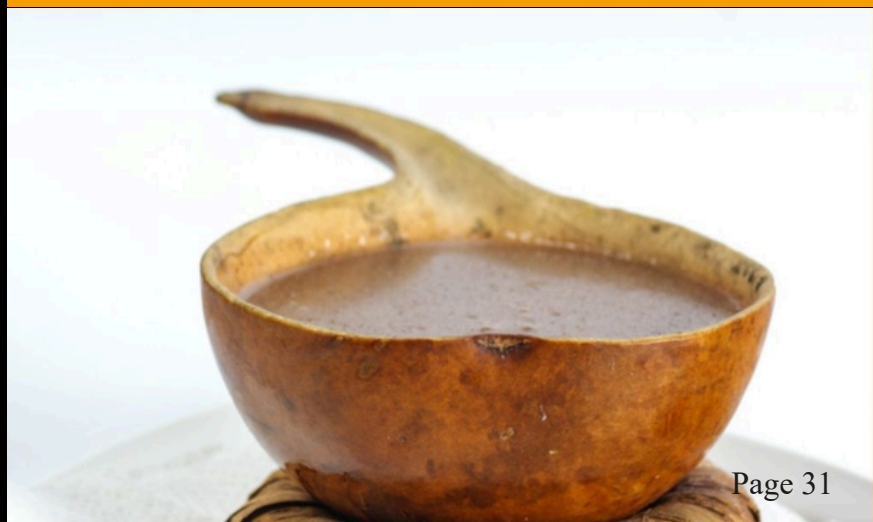
- Eliminates disease-causing microorganisms.
- Improves shelf stability after preparation.
- Gelatinizes starch, making porridge easier to digest.
- Produces a smooth texture preferred by many consumers.

The major disadvantage is that beneficial probiotic microorganisms are destroyed during cooking.

Fermented Porridges Consumed Without Heating After Fermentation

These products remain microbiologically active because they are consumed after fermentation and without boiling. They contain living lactic acid bacteria and yeasts that may provide probiotic benefits.

- Ūcūrū wa Mūkio (Kikuyu, Kenya)
 - Mahewu (Zimbabwe, South Africa, Botswana, Zambia)
 - Mageu (Botswana, Namibia, South Africa) Mageu is produced similarly to Mahewu.
 - Togwa (Tanzania)
 - Obushera (Uganda)
 -
- Main cereals include sorghum and millet.
- Munkoyo (Zambia)



BENEFITS OF FERMENTED PORRIDGE

1. Improved Digestion

Fermentation partially breaks down starches and proteins, making the porridge easier to digest.. It can reduce bloating or digestive discomfort for some people compared with unfermented grains. Lactic acid produced during fermentation may support a healthier digestive environment.

2. Better Nutrient Absorption

Fermentation reduces compounds called phytates, which normally bind minerals and reduce their absorption. This can improve the body's ability to absorb:

- Iron
- Zinc
- Calcium
- Magnesium

3. Supports Gut Health

Traditional fermentation encourages the growth of beneficial bacteria, such as lactic acid bacteria.

4. Improve Blood Sugar Control

Fermentation can slow the digestion of carbohydrates, lower the glycemic response of some porridges, and help produce a steadier rise in blood sugar after meals.



By Korina Villanueva

5. Enhance Vitamin Content

Certain beneficial bacteria can increase levels of some vitamins during fermentation, particularly some B vitamins (such as folate), and vitamin B12 in limited circumstances

6. Increase Antioxidant Activity

Fermentation can release antioxidant compounds that were previously bound within the grain. These antioxidants help protect cells from oxidative stress.

7. Improved Protein Quality

Fermentation increases the digestibility of proteins, reduces certain antinutritional compounds, and improves the availability of essential amino acids.

8. Strengthen immune function

A healthy gut microbiome plays an important role in immunity. Fermented foods may support immune health indirectly through their effects on gut bacteria and the production of beneficial fermentation byproducts.





AGE-SPECIFIC BENEFITS OF PROBIOTICS ACROSS THE HUMAN LIFESPAN.

Introduction

As far established, fermented foods play a vital and dynamic role in human health, extending far beyond their traditional use as preserved foods. Through the action of beneficial microorganisms, fermentation transforms ordinary foods into complex biological systems rich in probiotics, enzymes, and bioactive compounds. These components directly influence the gut microbiome, which serves as a central regulator of physiological and psychological processes. The gut microbiome is deeply interconnected with nearly every system in the body, including the immune system, metabolic pathways, and the nervous system. One of its most significant roles is its influence on the gut-brain axis, a communication network that links the gastrointestinal tract with the brain. Through this connection, fermented foods contribute not only to physical health but also to emotional stability, stress regulation, and cognitive function. The effects of fermented foods are not uniform across the lifespan. Instead, they adapt to the changing needs of the body at different stages of life. From early development in childhood to cognitive support in older adulthood, fermented foods provides targeted benefits that support growth, stability, and resilience. This chapter explores these benefits in depth, with particular emphasis on how they influence the mood and overall well-being.

Children

Development of a Healthy Gut Microbiome

In childhood, the gut microbiome is in a foundational stage, where microbial populations are still forming and stabilizing. Fermented foods provide a consistent source of beneficial bacteria that help establish microbial diversity, which is essential for long-term resilience.

These microorganisms actively shape the gut environment by producing metabolites such as shortchain fatty acids, which strengthen the intestinal lining and improve gut barrier function. A strong gut barrier prevents harmful substances from entering the bloodstream, reducing systemic inflammation and protecting developing organs, including the brain.

The early establishment of a balanced microbiome has profound implications for neurological development. The gut communicates with the developing brain through chemical signaling, influencing how neural circuits involved in emotion and stress response are formed. This means that children who consume fermented foods regularly may develop more stable emotional responses and greater adaptability to stress. Over time, this contributes to improved behavioral patterns, including better emotional control, reduced anxiety tendencies, and enhanced social interaction.



The immune system in children relies heavily on microbial exposure to develop properly. Fermented foods introduce beneficial bacteria that interact with immune cells, particularly within the gut, where a large portion of the immune system resides.

These interactions help regulate immune responses, ensuring that the body reacts appropriately to threats without becoming overactive. This reduces the likelihood of allergies and inflammatory conditions, which are increasingly common in early life. Chronic inflammation, even at low levels, can disrupt brain function and mood regulation. By reducing inflammation, fermented foods help maintain a stable internal environment that supports both physical and mental health.

Children with a well-regulated immune system often experience:

1. Fewer illnesses
2. Better sleep quality
3. More consistent energy levels

These factors collectively contribute to improved mood stability and reduced irritability.

Better Digestion and Nutrient Utilization.

Fermented foods enhance digestive efficiency by introducing enzymes and beneficial bacteria that aid in breaking down food. This is particularly important in children, whose digestive systems are still developing.

Immune System Maturation.

Improved digestion leads to better absorption of essential nutrients required for growth and brain development. Nutrients such as iron, magnesium, and B vitamins are critical for neurotransmitter production and cognitive function. When nutrient absorption is optimized, children experience more stable energy levels and improved concentration. Conversely, poor digestion can lead to discomfort, which often manifests as irritability and behavioral challenges. By supporting digestion, fermented foods help maintain a balance between physical comfort and emotional well-being, allowing children to function more effectively both cognitively and socially.



Support for Growth and Development

Fermented foods support overall growth by improving nutrient availability and reducing inflammation that could otherwise interfere with developmental processes. They also influence hormonal and metabolic pathways, ensuring that energy is efficiently used for physical and neurological development. In the brain, this translates into improved synaptic function, better memory formation, and enhanced learning capacity.

In addition to cognitive benefits, fermented foods contribute to emotional development by supporting neurotransmitter balance. This helps children regulate their emotions more effectively, leading to improved behavior and social interactions.

Adolescents

Nutritional Support During Growth Spurts

Adolescence is a period of rapid growth, requiring increased intake and efficient utilization of nutrients. Fermented foods enhance digestion and improve the bioavailability of essential nutrients, ensuring that the body can meet these demands.

This improved nutrient absorption supports physical development while also maintaining stable energy levels. Stable energy is essential for preventing fatigue and mood fluctuations, which are common during adolescence. By ensuring a consistent nutrient supply, fermented foods help adolescents maintain both physical vitality and emotional balance.

Promotion of Mental Well-being Through the Gut-Brain Axis.

The adolescent brain is undergoing significant structural and functional changes, making it particularly sensitive to fluctuations in neurotransmitters and stress hormones.

Fermented foods support the gut-brain axis by promoting the production of neurotransmitters such as serotonin and dopamine. They also help regulate the stress response system, reducing excessive cortisol levels.

This leads to improved emotional regulation, allowing adolescents to better manage stress, anxiety, and social pressures. The stabilization of mood during this stage is crucial, as it can influence long-term mental health outcomes.



Hormonal Balance and Psychological Stability

Hormonal changes during adolescence can disrupt both physical and emotional balance. Fermented foods help regulate hormone metabolism by supporting gut and liver function.

A balanced microbiome ensures that hormones are processed efficiently, reducing extreme fluctuations that can lead to mood swings and emotional instability. In addition, the anti-inflammatory effects of fermented foods support hormonal balance, further contributing to psychological stability and improved mental well-being.

Digestive Health and Behavioral Impact

Digestive health plays a significant role in adolescent behavior and mood. Fermented foods help maintain gut balance, reducing symptoms such as bloating and discomfort.

Physical discomfort can negatively impact mood and concentration. By improving digestive health, fermented foods support better focus, reduced irritability, and enhanced emotional regulation.



Adults

1. Improved Digestive and Metabolic Health

In adulthood, the cumulative effects of lifestyle factors can disrupt gut health. Fermented foods help restore microbial balance, improving digestion and metabolic efficiency.

They support the breakdown of nutrients and regulate blood sugar levels, preventing energy fluctuations that can affect mood. Stable metabolism is closely linked to emotional well-being, as consistent energy levels reduce irritability and improve cognitive performance.

2. Better Stress Management and Emotional Regulation

Chronic stress is a major challenge in adulthood, affecting both physical and mental health. Fermented foods support the regulation of the stress response system through their influence on the gut-brain axis.

They help reduce cortisol levels and promote the production of calming neurotransmitters, leading to improved relaxation and emotional control.

Regular consumption contributes to long-term resilience, allowing individuals to manage stress more effectively and maintain a stable mood.

Enhanced Immune Function

3. Fermented foods strengthen the immune system by supporting beneficial bacteria that regulate immune responses. This reduces inflammation and improves overall health.

Lower inflammation levels are associated with improved mental clarity and reduced risk of mood disorders, highlighting the connection between immune health and emotional well-being.

Maintenance of Microbial Diversity

4. A diverse microbiome is essential for maintaining resilience against stress, illness, and environmental changes. Fermented foods help preserve this diversity, ensuring stable gut function. This stability supports consistent neurotransmitter production, contributing to long-term emotional balance and reduced risk of mental health issues.

OLDER ADULTS

Improved Nutrient Absorption

As the body ages, digestive efficiency declines. Fermented foods enhance nutrient absorption, ensuring that essential nutrients remain available for brain and body function. Improved nutrient availability supports cognitive health, and helps prevent mood disturbances associated with deficiencies.

Support for Healthy Aging

Fermented foods reduce chronic inflammation, a major factor in age-related decline. Lower inflammation supports both physical health and emotional stability.

This contributes to improved quality of life, increased energy levels, and a more positive outlook.

Better Immunity

The immune system becomes less efficient with age. Fermented foods strengthen immune defenses, reducing the risk of infections and chronic illness.

Improved immune health reduces physical stress on the body, which in turn supports mental and emotional well-being.

Cognitive and Digestive Health Support

The gut-brain axis remains important throughout life. Fermented foods support this connection by reducing neuroinflammation and promoting neurotransmitter balance.

This helps preserve cognitive function, memory, and emotional stability, allowing older adults to maintain independence and quality of life.



RECIPES FOR FERMENTED PRODUCTS AND PROBIOTICS



Kefir

To make Kefir milk, you will need Kefir grains and Fresh milk, a glass jar, a wooden stirring spoon, and a dry kitchen towel/net/linen cloth.

Procedure

1. Put the Kefir grains into the glass jar.
2. Pour fresh milk into the jar. Let it sit for a bit.
3. Cover the jar with a linen cloth. Let it sit for 18 to 72 hours.
4. Keep the jar away from sunlight and make sure the temperature is between 20 and 25 degrees Celsius. When it is ready, strain the Kefir grains from the milk.
5. Pour the milk into a glass container or empty bottle for packaging.
6. Remember to keep the Kefir grains in Fresh milk so they stay healthy.
7. Some tips for making Kefir milk:
8. Use good quality milk to get results.
9. The longer you let it sit the more sour the milk will be.

Sauerkraut

To make Sauerkraut you will need cabbage and salt.

Preparation

1. Shred the cabbage into pieces.
2. Into a basin put the shredded cabbage, add salt and massage and squeeze it for 10-15 minutes.
3. Transfer the cabbage and the brine into a glass jar as you press it down to get rid of any air.
4. Ensure the cabbage is fully submerged in the brine, otherwise add little water to keep it covered.
5. Cover the jar with a lid.
6. Let it sit for two to four weeks.
7. Remember to burp every day to release the gas.
8. Keep the jar at a temperature of 18 to 22 degrees Celsius.
9. When it is ready, seal the jar. Put it in the fridge.



Kombucha

To make Kombucha, you will need; Scooby, starter culture, black tea or herbal tea, water, hibiscus or lemon grass, and sugar.

Procedure

1. Make tea in a pot and let it boil.
2. Add sugar to the tea.
3. Strain the tea to get rid of the residue of your tea of choice.
4. Add water to top your volume and let it cool.
5. Add the starter culture to the mixture.
6. Put the Scooby into the jar. Cover it with a linen cloth.
7. Let it sit for 7 to 14 days.
8. Strain the mixture. Pour the liquid into a bottle and put it in the fridge.



Ginger Bug

To make Ginger bug, you will need ginger, water and sugar.

Procedure

1. Day one

- Pour water into a glass jar.
- Add two tablespoons of ginger to the jar.
- Add two tablespoons of sugar to the jar.
- Stir the mixture until the sugar is dissolved.
- Cover the jar with a cloth.
- Let it sit at room temperature away from sunlight.

1. Day Two to Seven

- Add one tablespoon of ginger and one tablespoon of sugar to the jar every day.
- Stir the mixture well every day.
- Strain the liquid when you want to use it.
- Add a quarter to half cup of Ginger bug liquid to one liter of herbal tea or ginger tea.
- Pour the liquid into a bottle. Let it sit for one to three days.
- Then put the bottle in the fridge.





Tepache

To make Tepache, you will need pineapple, brown sugar, water, and spices like cloves or cinnamon sticks.

Preparation procedure

1. Peel the pineapple and save the peels and core.
2. Dissolve sugar in water.
3. Put the pineapple peels and core into a jar.
4. Add the sugar solution and any spices you like to the jar.
5. Cover the jar with a cloth and tie it tightly.
6. Let it sit at room temperature for two to four days.
7. Stir the mixture every day. Taste it from the second day.
8. Strain the mixture. Pour it into a bottle.
9. Put the bottle in the fridge. Drink it within five to seven days.

Fermented porridge.

To make fermented porridge you will need one cup of millet flour or a mixture of sorghum and millet and one liter of water.

Procedure

1. Mix the flour with water to make a smooth, thick paste.
2. Cover the container with a cloth or a loose lid.
3. Let it sit at room temperature for 24 to 48 hours.
4. Boil one liter of water in a pot.
5. Add the fermented paste to the boiling water. Stir well to avoid lumps.
6. Reduce the heat. Let it cook for 10 to 15 minutes stirring occasionally, until the porridge is smooth and fully cooked.
7. Serve the porridge warm. Add milk if you like.

Busaa

A local fermented drink among the Luhya community.

To make Busaa you will need Maize flour, sorghum, water, and millet.

Procedure

1. Grind the maize into flour. Put it into a pot covered with banana leaves.
2. Mix the maize flour with water to make a paste.
3. Let it sit for two to three days to ferment.
4. Heat the paste. Roast it in a large metal pan for about 30 minutes until it is deep brown and smells malty.
5. Prepare the malt by soaking millet grains, spreading them on trays to germinate for two days, sun-drying them, and grinding them into flour.
6. Mix the roasted maize paste with water. Add the millet malt.
7. Let it sit for two days to develop the flavor.

Mursik

A local fermented milk among the kalenjin community.

To make Mursik you will need fresh cow's milk and ground charcoal.

Procedure

1. Clean a gourd or sotet thoroughly.
2. Put a layer of finely ground charcoal into the calabash.
3. Add milk to the gourd and let it sit for two to five days.
4. When it is ready, serve the milk as a drink in a gourd or cups

Muratina

Muratina.

To make Muratina you will need sugarcane juice, fruit from sausage tree, and honey.

Procedure

1. Cut the fruit into pieces and sun-dry it for an hour.
2. Boil the fruit in water for 30 minutes.
3. Sun dry the fruit again, adding sugarcane juice.
4. Put the mixture into a jerry can in a place and let it sit for four days.
5. The longer it sits, the sourer it gets.
6. Take 2 cups a day.

Mnazi

To make Mnazi, you will need a coconut tree.

Procedure.

- Collect the juice in a container tied under the cut region.
- Collect the juice twice a day in the morning and evening.
- The fresh palm sap is sweet and not alcoholic. As time passes, the taste becomes sour.
- Within two to four hours, it becomes mildly alcoholic. After one day it becomes more sour. The more it sits, the sourer it gets.

It is best to drink it during the day unless you put it in the fridge

Fermented millet porridge.

To make Fermented millet porridge, you will need Finger millet, and water.

Preparation

1. Boil water in a pot until it is boiling.
2. Mix millet with water to make a paste and add it to the boiling water.
3. Stir well to avoid lumps.
4. You can add lemon, cinnamon.
5. Serve it when it is ready.



Togwa

A popular fermented drink among the Swahili communities in the coastal region.

To make Togwa, you will need maize or sorghum flour, water and germinated seed flour (finger millet).

Procedure

1. Mix sorghum/ maize flour with water and let it boil into a porridge.
2. Let the porridge cool down
3. Add germinated seed flour.
4. Let it sit for one to two days to ferment.



PAIRING FERMENTED FOODS WITH EVERYDAY MEALS

Introduction

Fermented foods are rarely consumed alone and as seen across many African communities they are served alongside cereals, legumes, vegetables, fruits, fish, meat, and healthy fats to create balanced meals. Combining fermented foods with nutrient-rich ingredients improves digestion, supports the growth of beneficial gut bacteria, enhances nutrient absorption, strengthens immunity, and promotes overall wellness.

Why Food Pairing Matters

It is important to know that beneficial microorganisms require nourishment to survive and thrive in the digestive tract. This nourishment comes from prebiotic foods, which are rich in dietary fiber. When fermented foods are combined with whole grains, vegetables, fruits, legumes, nuts, and seeds, they create a synergistic effect that supports the gut microbiome and overall health.

A balanced meal should ideally provide:

- Probiotics from fermented foods.
- Prebiotic fiber from fruits, vegetables, legumes, and whole grains.
- Protein for tissue repair and immune function.
- Healthy fats for improved absorption of fat-soluble vitamins.
- Vitamins, minerals, and antioxidants that support body functions.



“WHEN FERMENTED FOODS ARE COMBINED WITH WHOLE GRAINS, VEGETABLES, FRUITS, LEGUMES, NUTS, AND SEEDS, THEY CREATE A SYNERGISTIC EFFECT THAT SUPPORTS THE GUT MICROBIOME AND OVERALL HEALTH.”



EXAMPLES OF FOODS TO PAIR WITH FERMENTED FOODS

Mala

Mala is one of East Africa's most popular fermented milk products and is an excellent source of probiotics, calcium, and protein.

Best Foods to Pair With

- Brown ugali.
- Sweet potatoes.
- Arrowroots.
- Cassava
- Beans.
- Leafy vegetables.
- Avocado and groundnuts.

Best Time to Consume

Breakfast, Lunch, Evening meal or after exercise

Benefits of Pairing

These combinations create balanced meals that improve digestion, provide sustained energy, and support gut and bone health.

Kimchi

Kimchi is a fermented vegetable dish prepared using cabbage, garlic, ginger, Chilli, and other vegetables.

Best Foods to Pair With

- Meat of choice (Fish, chicken, pork, beef etc)
- Eggs.
- Legumes (beans, lentils, peas etc.)
- Steamed vegetables.

Best Time to Consume

Kimchi can be taken during lunch or dinner time.

Best Time to Consume

Kimchi can be taken during lunch or dinner time.

Fermented Cassava

Fermented cassava is more digestible than fresh cassava and remains a staple food in several African communities.

Best Foods to Pair With

1. Legumes
2. Meat (Fish, chicken etc.)
3. Green leafy vegetables.
4. Avocado.
5. Groundnuts.

Best Time to Consume

Fermented cassava can be taken at lunch or dinner.

-



EXAMPLES OF FOODS TO PAIR WITH FERMENTED FOODS

Sauerkraut

Sauerkraut is fermented cabbage rich in probiotics, dietary fiber, vitamin C, and antioxidants. Its tangy flavor makes it an excellent side dish.

Best Foods to Pair With

1. Chicken, beef, fish, eggs, beans, and lentils.
2. Millet or sorghum ugali.
3. Avocado, pumpkin seeds, and groundnuts.
4. Fresh salads and steamed vegetables.



Mursik

Mursik is a traditional Kenyan fermented milk that is rich in probiotics, calcium, protein, and B vitamins.

Best Foods to Pair With

- Millet or sorghum ugali (tiny portion)
- Sweet potatoes and arrowroots.
- Traditional leafy vegetables.
- Lean beef, goat meat, or fish



Kefir Milk

Kefir contains one of the widest varieties of beneficial bacteria and yeasts among fermented dairy products.

Best Foods to Pair With

- Oats.
- Chia seeds and flaxseeds.
- Berries, Almonds and walnuts.

Best Time to Consume

Breakfast, Mid-morning snack or after exercise

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The Africa that We've forgotten

Every African Community for a millennium had its own form of either fermented food or drink. This is the Africa we need to rethink and reclaim.



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