the truth about antibiotics

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Introduction

This book was a difficult birth for me, but I am so grateful for the result. It feels just like the birth of a child: you immediately forget the pain and look forward to what is to come. I feel blessed. First and foremost with my three children, but also with the attitude to life that I have somehow acquired: there is always a solution. The trick is to keep searching until you find it.

Before the pandemic, antibiotic resistance was the most urgent global health problem, according to the World Health Organization. And even now, after the pandemic, this remains the case. If we continue as we are, within barely 25 years more people will die from the consequences of antibiotic resistance than die from cancer today. This is not scaremongering; it is simply the prognosis based on the figures.

But this does not have to happen. Only if we continue to stick to the current approach will this grim prediction remain relevant. That is precisely why I am convinced that this book can contribute to breaking the vicious cycle of antibiotics.

As a parent, you explain the world to your child. I think we do that twice: first, the version as it could be, and then the harsh reality. For example: the war industry is the largest industry in the world, followed by the pharmaceutical sector...

Yet I also see a hopeful future:

- Where more energy is devoted to diplomacy than to war.
- Where more is spent on prevention than on illness.
- Where well-being at every age is more important than economic growth.
- Where people experience less stress and more free time.

With today's technology and knowledge, this should be possible. The budgets that would be freed up if the focus were on prevention are astronomical. Please don't be discouraged while reading this book. I know you don't want to hear any more bad news. Just keep reading: fortunately, you will also find possible solutions.

Our knowledge of our gut flora has grown exponentially over the past twenty years. Yet there is a major problem: it takes an average of seventeen years for new research results to actually find their way into practice. Moreover, only 14% of clinical research is ultimately applied. That is time we cannot afford to waste.

In short: if we do not limit our use of antibiotics to what is strictly necessary as soon as possible and focus as much as possible on prevention, it will become increasingly difficult for future generations to stay healthy. The necessary preventive measures are relatively simple and financially responsible.

That is why I wrote this book, based on the latest insights from functional medicine, gut microbiology, and orthomolecular therapy. My passion for prevention and fascination with causal relationships have prompted me to conduct intensive research over the past four years. I was regularly amazed by the figures, the impact, and the persistent ignorance—including my own. What struck me most is that the necessary connections between these insights are hardly ever made. Simple, effective solutions do exist, but they are rarely applied on a broad scale.

Our healthcare system focuses primarily on the symptomatic treatment of complaints. The budget for prevention is only a fraction of what is spent — and earned — on illness. With this book, I hope to contribute to a necessary change in mentality. Bacteria have an undeserved bad reputation. In reality, it is precisely the right bacteria, at the right time, that can guarantee that future generations will remain healthy.

All the best,

Maïté Matterne

Crazy enough to think she can change the world.

Want to see for yourself how quickly bacteria can become resistant?

Follow the link and watch the BBC video, it takes less than 2 minutes.

Source: BBC via Facebook, accessed on August 10, 2025.

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"We all agree that your theory is crazy, but is it crazy enough?!"

Niels Bohr

CHAPTER 0 - Legal restrictions and disclaimer

The information below applies to Belgium; legislation may vary from country to country. To easily find out which information applies to your country, you can use this prompt for Chat-GPT:

Provide a summary in simple language of the current rules and legislation in my country regarding:

1. what doctors and midwives are legally allowed/not allowed to do in terms of complementary care and medical claims,
2. what therapists/coaches are/are not allowed to do (diagnosis, treatment, reviews, product names, health claims),
3. the rights of parents when making decisions about their child's care.

My county is ENTER YOUR COUNTRY/REGION HERE: []

0.1. Lack of knowledge among healthcare providers

The information in this book was not yet widely known among midwives at the time of publication, and was largely unavailable during your midwifery training. **You can't blame anyone for this, because keeping up to date is more than a full-time job, given the sheer volume of research results published every day:**

According to the journal Nature, **last year saw almost 20,000 new publications** dedicated to the microbiome, a number that continues to grow due to the enormous scientific and medical interest in this subject. **In the last ten years, more than 40,000 studies have been registered on PubMed, with more than half of these published in the last three years.**

And that's just talking about the microbiome...

0.2. Legal restrictions for physicians

A doctor may **offer complementary care**, but **only as a supplement to conventional medicine** and within the limits of the law on the practice of medicine (Law of May 10, 2015, reformed from the law of 1967).

The conditions are:

The doctor remains **fully responsible** for medical treatment.

Complementary treatment may not replace conventional treatment.

The doctor must act in a **scientifically sound and responsible** manner, with respect for the "rules of good practice."

What is a doctor in Belgium not allowed to do?

Offer alternative therapies **instead of** conventional treatments for serious conditions (e.g., cancer, infectious diseases).

Offer treatments that **have no scientific basis** or could be considered "misleading."

Encourage patients to discontinue conventional treatments.

0.3. Legal restrictions for therapists:

In Belgium, therapists are not allowed to:

Conduct research based on symptoms/complaints

Treat symptoms/complaints

That is why I work from the Netherlands, where I can remain within the law and my field of expertise. Because I mainly work online, I do not experience any restrictions.

In Europe, therapists/coaches/healthcare providers are not allowed to:

Publish client reviews on their own website or social media. Legal basis:

- *European Regulation on health claims (EC No. 1924/2006)*
- *Law on Medical Practice (BE) / Law on Medical Treatment Agreements (NL)*
- *In BE: additional provisions of the FPS Economy on advertising and consumer protection*

What is allowed?

Inviting clients to share their experiences on independent review platforms (e.g., Google Reviews), without active promotion or inclusion in marketing communications.

Using neutral responses, without health claims, e.g.:

"I felt heard and understood." "The guidance was warm and professional." "I gained many valuable insights."

with this warning: "Please note: Do not link statements to specific health results and always add a disclaimer: *"Experiences vary from person to person." and "This guidance does not replace medical advice."*

Communication about guidance

Not: “I treat irritable bowel syndrome, fatigue, or skin conditions through intestinal therapy.”

Instead: “I guide people who want to support their digestion and intestinal health through nutritional advice and lifestyle optimization, for greater comfort and vitality.”

Why no comparisons with antibiotics?

According to European and national legislation (including EFSA guidelines), the health benefits of foods, supplements, or natural substances may not be compared to medicines such as antibiotics.

Prohibited statements:

“Natural alternatives are better than antibiotics.”

“This approach causes fewer side effects than broad-spectrum antibiotics.”

Even if you only want to indicate that something disrupts the microbiome less, this counts as an implicit medical claim.

What is allowed?

“This approach supports symbiosis without disrupting the entire ecosystem.”

“This approach is in line with the desire to put as little strain on the microbiome as possible.”

This way, I stay within the law and can share valuable information without the risk of fines or legal consequences.

Why I removed the reviews from my website:

In Belgium and the Netherlands (and throughout the EU), it is not permitted to substantiate medical claims with testimonials or reviews from clients if they imply that your therapy has a certain health effect. This certainly applies when it comes to treating, alleviating, or curing diseases — and also if it is only a matter of “supporting.”

Why I do not mention product names:

According to Regulation (EC) No 1924/2006 and the interpretations of the FAVV (Belgium) and the NVWA (Netherlands), it is not permitted to directly or indirectly lead consumers to purchase products that contain health claims for which no approval has been obtained, even through prompts, search terms, or hints.

I am only allowed to mention product names and discuss health-promoting effects if there is an EFSA-approved claim for them.

However, the list of permitted claims is limited when you consider the immense amount of research on bacteria with promising results. These findings usually end with the adage: 'more research is needed to definitively establish effectiveness and safety in humans'.

As a result, many potential benefits from recent scientific research cannot be attributed to specific brands or products — even when initial results are promising.

This book is full of such "initial promising results." In the interest of fairness, I have supplemented the list of scientific references at the back of the book with information about the nature of the research: human, animal, or other.

Personally, I do value these results, knowing that an average research result is the work of a team of scientists who have worked on it for an average of two years and that the function of the intestines in mammals is not identical but is similar in terms of digestion, hormone production, immunity, and the like.

0.4. Parents' rights

As a parent, you **always** have the final say on the treatment proposed for your child. You are **not** obliged to agree with the advice of doctors or nursing staff—you have the right to ask questions, express doubts, and request alternatives. It is your right to stand up for your child.

Want to see for yourself how quickly bacteria can become resistant?

Follow the link and watch the BBC video, it takes less than 2 minutes.

Source: BBC via Facebook, accessed on August 10, 2025.

CHAPTER 1 – The Gut Microbiome

1.1. What is the (gut) microbiome?

We carry billions of microorganisms with us—bacteria, viruses, fungi, and even parasites. Every person on Earth has a unique mix of these microscopic inhabitants. Together, they form the **microbiome**: a complex ecosystem that lives in and on our bodies.

For a long time, these microorganisms had a bad reputation, but that is unjustified. In reality, they are **essential to our survival** — unless you live in a sterile bubble, and who would want that?

The **gut microbiome** — also known as "gut flora" — plays a particularly central role. It consists of trillions of bacteria in your intestines and influences much more than just your digestion. It is **vital to your overall health**, your immune system, your hormones, and even your mood.

The average gut microbiome consists of approximately 100,000,000,000,000 bacteria, divided into 1,200 species.

A new microbiome is built up from pregnancy through to the second year of life — the crucial **first 1,000 days**.

That is why it makes sense to optimize the mother's microbiome during pregnancy: an investment in the best possible start for her baby.

The list below does not claim to be complete, but it does aim to give you an idea of how broad the impact of our gut microbiome is.

1.2. The gut microbiome influences all other microbiomes

We have multiple microbiomes: on our skin, in our blood, in the vagina, the brain, the lungs, the liver, in breast milk, and so on.

The most influential of all is the gut microbiome; it is the largest and most complex microbiome, and it largely determines the composition and functioning of all other microbiomes in our body.

How does it do that? Through the production and release of substances that affect the entire body—such as short-chain fatty acids, hormones, neurotransmitters, and immune-modulating molecules.

These substances—and in some cases even bacteria themselves—are distributed through the blood and can reach other parts of the body. There, they help to form or maintain the balance of local microbiomes.

These interactions are crucial to our overall health. A disturbed gut microbiome — known as dysbiosis — can therefore have consequences far beyond the gut: from vaginal complaints to skin problems, from sleep problems to reduced milk production, and even to impaired brain function and mood disorders.

1.3. The gut microbiome affects your entire functioning

1.3.1. Desire to have children & fertility

The desire to have a child often starts with a longing or a positive pregnancy test. But what many people don't realize is that a healthy start begins even before conception. More and more research shows that the microbiome—the collection of bacteria in our bodies—has a crucial influence on the fertility of both women and men.

Fertility in women: a matter of balance

In women, the microbiome helps regulate hormones such as estrogen and progesterone, partly through the so-called *estroboloom*. This is the part of the gut microbiome that can break down, convert, and recycle estrogens. When this balance is disrupted, symptoms such as PMS, endometriosis, irregular cycles, or difficulties with implantation can arise.

In addition, the vaginal flora — which is **strongly** influenced by the intestinal flora — plays a key role in conception. A healthy flora, rich in *Lactobacillus* species, promotes optimal acidity, protects against infections, and increases the chance of successful fertilization. Impaired vaginal flora is associated with reduced fertility and recurrent miscarriages.

Male fertility: inflammation as a silent saboteur

An imbalance in the intestines — dysbiosis — increases susceptibility to inflammation throughout the body. This chronic, low-grade inflammation can not only negatively affect sperm quality, but also disrupt testosterone production.

It is striking that young men today produce on average up to 30% less testosterone than they did a few decades ago. Possible explanations for this include a combination of factors, such as exposure to hormone-disrupting substances, nutritional deficiencies, and possibly also a disturbed microbiome.

Healthy gut flora, on the other hand, helps protect sperm cells through antioxidants and supports the hormonal balance needed for optimal sperm production.

Preparation for two: the microbiome of both partners counts

The development of the baby's microbiome therefore starts with the microbiome of the parents. It is therefore advisable for people who want to have children to start optimizing their gut flora

through diet, supplementation, and lifestyle changes, ideally at least three months before conception.

This not only increases the chances of a natural pregnancy, but also lays the foundation for a healthy and resilient child.

1.3.2. Sleep

What many people don't know is that our gut flora plays a silent but powerful role in the quality of our sleep. Recent studies convincingly show that the bacteria in your gut can influence *how deeply* you sleep, *how long* you sleep, and even *how you feel the next day* [1'4].

How gut bacteria influence your sleep

Our sleep consists of different phases: NREM (non-rapid eye movement) and REM (rapid eye movement) sleep. Both phases are crucial, but they are influenced differently by your gut microbiome.

NREM sleep: the recovery phase

Approximately 75 to 80% of our sleep consists of NREM sleep. During this deep rest phase, your body recovers physically, inflammation is inhibited, and your brain has the opportunity to detoxify. Animal models have shown that **butyrate**, a short-chain fatty acid produced by certain gut bacteria, enhances NREM sleep. A healthy gut flora therefore literally promotes your deepest rest.

REM sleep: dreaming, processing, and developing

REM sleep is the phase in which we dream, process information, and regulate emotions. In babies and young children, this phase is also essential for brain development. Various bacteria appear to influence the duration and quality of REM sleep. For example, bacteria from the Christensenellaceae family are positively associated with longer REM sleep, while Enterobacteriaceae appear to have a negative effect. Shorter REM sleep also appears to be linked to poorer blood sugar balance.

Total sleep duration and sleep efficiency

The total duration of your sleep and the efficiency of your sleep (how well you sleep without waking up) also appear to be linked to the composition of your gut flora. Some bacteria influence **neurotransmitter metabolism** (such as serotonin and GABA), or they influence your **immune system**, which in turn affects your sleep quality [5].

Disturbed gut flora = disturbed sleep?

Research shows that people with **disturbed gut flora** are more likely to suffer from sleep problems. They report difficulty falling asleep, restless sleep, or waking up **not feeling rested** in the morning [4].

One explanation for sleep problems associated with disturbed gut flora is the increase in **low-grade inflammation**: silent, chronic inflammatory responses that affect your biochemistry without any obvious symptoms.

Dysbiosis — an imbalance between good and harmful gut bacteria — can lead to the formation of toxic substances such as LPS (lipopolysaccharides). **These substances are part of the cell wall of certain 'bad' bacteria and are recognized by the body as a threat.** They can enter the bloodstream through a leaky intestinal wall, **where they activate the immune system and thus trigger chronic, mild inflammation.**

Such inflammation disrupts, among other things, the production of serotonin. **Low-grade inflammation increases the activity of the enzyme IDO (indoleamine 2,3-dioxygenase), which breaks down the amino acid tryptophan.** This makes tryptophan less available for the production of serotonin, your happiness hormone that regulates motility in the intestines, and **melatonin**, the hormone that regulates your sleep-wake cycle.

In addition, some intestinal bacteria normally also produce **sleep-supporting substances** such as GABA and short-chain fatty acids. Dysbiosis also eliminates this natural support.

The result: **a disturbed sleep rhythm and reduced sleep quality**.

1.3.3. Weight

Did you know that your gut microbiome plays a decisive role in your weight? Scientists have discovered that some bacteria extract energy from food more efficiently than others. Obese people often have a very different composition of gut flora than slim people — with significantly more Firmicutes and fewer Bacteroidetes.[1-2-3]

These bacteria not only influence your metabolism, but also how and where you store fat. Fat stored in the abdomen and around organs is associated with increased susceptibility to inflammation — especially when there is a long-term disturbance in the gut flora ("dysbiosis").[4-5-6]

Chronic low-grade inflammation that arises in a disturbed intestinal environment can affect insulin sensitivity, which in turn leads to extra fat storage.[6-7] The gut flora can also influence the feeling of satiety via signals to the brain, thereby controlling eating behavior.

Mouse experiment proves the link

A powerful experiment with mice made this link very tangible: researchers transplanted gut flora from an obese mouse to a lean mouse, and vice versa. Without any change in diet, the lean mouse

gained weight — and the obese mouse lost weight.[8] The composition of the gut flora itself appeared to determine weight.

Gastric bypass... or microbiome optimization?

When it comes to obesity, diets or bariatric surgery are often considered. But both can greatly reduce the diversity of the gut microbiome.[9] Optimizing the microbiome — through diet, supplements, and lifestyle — can demonstrably reduce body fat without side effects.[10]

1.3.4. Intelligence

At first glance, how smart a baby becomes seems to be mainly genetically determined. But recent insights show that the **gut microbiome** also has an important influence on brain development—starting as early as pregnancy. Communication between the gut and the brain takes place via an ingenious system called the **microbiome-gut-brain axis**.

What is the microbiome-gut-brain axis?

Our intestines are in constant interaction with our brains. This communication takes place via:

- the **nervous system** (especially the vagus nerve)
- the **immune system**
- the **tryptophan metabolism** (important for serotonin)
- and via **microbial metabolites** such as butyrate [1–10].

These signals go **in two directions**: the brain can influence the microbiome, and conversely, changes in the gut flora can affect how you feel, think, learn, and remember.

The intestines influence cognitive functions

Changes in the microbiome appear to influence brain functions such as:

- **memory**
- **learning**
- **concentration**
- and even **problem-solving ability** [1,3,4,5]

In young children, and even in the womb, well-functioning intestinal flora can contribute to better brain development.

Stress affects the microbiome (and therefore the brain)

Chronic or prenatal stress has a demonstrable impact on the composition of the gut flora. This, in turn, can affect the development of the nervous system and the behavior of children. Babies of

stressed mothers are more likely to have abnormal intestinal flora and increased vulnerability to mental health problems later in life [4-5-7-9].

Can you influence brain function through diet?

Yes. Diet influences your microbiome and therefore also your brain. Targeted support of the gut flora with **prebiotics** (fiber), **probiotics** (good bacteria), and **gut-friendly foods** can improve brain function and mood[2-3-4-7-8-10]. This opens the door to new, gentle treatment options for learning difficulties, depression, autism, and other conditions. See further below under "laboratory studies."

Conclusion

Your gut thinks for itself. Literally. The gut flora plays a role in how we learn, remember, and even how our emotions are regulated. By consciously managing stress, nutrition, and supporting the microbiome during pregnancy, it is possible to give a baby's brain development a valuable head start while also supporting your own mental resilience.

1.3.5. Personality

Why is one child naturally calm and thoughtful, while another is spontaneous and impulsive? Although heredity and upbringing play a major role, new research points to a surprising third factor: the **gut flora**. More and more studies show that the microbiome can influence our **personality traits** through complex communication between the gut, brain, and immune system.

How do gut bacteria influence our personality?

The gut is in constant communication with the brain. This **gut-brain axis** not only plays a role in our mood, but also in behavioral traits that we experience as part of our personality—such as anxiety, resilience, curiosity, or social interaction.

Scientists distinguish four main mechanisms through which the microbiome can influence personality:

1. Production of neurotransmitters

Certain gut bacteria produce neurotransmitters such as:

- **Serotonin** (linked to calmness, self-confidence, and social behavior),
- **Dopamine** (important for motivation, pleasure, and reward),
- **GABA** (inhibitory, helps with relaxation).

These substances are partly produced in the gut and can send signals to the brain via the vagus nerve, influencing behavior and mood [1-2].

2. Modulation of the immune system

Disturbed gut flora can lead to **low-grade inflammation** that subtly affects brain function. Inflammatory substances such as cytokines are linked to mood disorders and behavioral changes. This can manifest itself in, for example, irritability, withdrawn behavior, or even reduced self-confidence [3-4].

3. Influence on stress responses

The intestinal flora influences the **HPA axis** (hypothalamic-pituitary-adrenal axis), the system that regulates our stress response. A stable intestinal flora contributes to a healthy cortisol balance. This enables your child to cope better with setbacks and stress later in life – qualities that contribute greatly to balanced personality development [5].

4. Influencing behavior via the gut-brain axis

Bacteria communicate with brain cells via direct connections, such as the **vagus nerve**. This involves the release of signaling substances that influence behavior. Animal studies show that administering certain bacteria leads to more exploratory behavior, less anxiety, or, conversely, more caution—all aspects of what we experience as "personality." [6]

1.3.6. Sexual preference in men

Our sexual preference is often seen as something that is fixed in our genes or shaped by upbringing and experience. But more and more research points to a third influence: **the role of the microbiome**. Although this topic is still under development, recent findings suggest that certain gut bacteria may contribute to the development of sexual preference – via hormonal and neurological pathways.

Microbiome, brain, and hormones: a subtle interplay

The bacteria in our intestines constantly communicate with our brains via the gut-brain axis, where they can influence behavior, mood, and hormonal balance.

Some important mechanisms associated with sexual preference:

1. Influence on hormones

Different strains of bacteria can produce substances that influence our **testosterone levels**—a hormone that is not only related to sex hormones but also to behavior. Studies show that gut bacteria such as **Acinetobacter, Dorea, Ruminococcus, and Megamonas** play a role in predicting circulating testosterone levels [4-5].

It is noteworthy that **average testosterone levels in men have been declining** over the past few decades, by about 1% per year – from 600–800 ng/dL in the 1990s to 400–600 ng/dL today [3]. This trend may be influenced in part by changes in lifestyle, diet, and microbiome composition.

2. Neurotransmitters and brain function

The microbiome also produces neurotransmitters such as serotonin and dopamine, which play a role in behavior, motivation, attraction, and social bonding—all factors that may influence how sexual preference is expressed [1-2].

3. Unique microbiome profiles in men who have sex with men

Studies show that men who have sex with men (MSM) often have an abnormal microbiome profile, particularly a **higher presence of Prevotella** bacteria [6-7]. Whether this microbiome pattern is a **cause or consequence** of lifestyle, sexual activity, or other factors remains unclear—but it points to a unique interaction between gut flora and behavior.

Important to emphasize

- **There is no "microbiome for sexual preference."** The research shows correlations, not causal relationships. Sexual preference is complex and influenced by many factors: biological, hormonal, social, psychological, and possibly also microbiological.
- **A diverse and balanced microbiome supports hormonal and neurological health**, regardless of sexual preference.
- **More research is needed**, and it is important to continue to approach these topics openly and without prejudice.

The balance of Prevotella in the gut microbiome is mainly determined by competition with Bacteroides, the production of short-chain fatty acids, diet (fiber intake), and the diversity of both Prevotella and the total microbiome. A fiber-rich diet that limits the consumption of grains (and grain products) and a diverse bacterial community are essential for maintaining Prevotella balance and preventing overgrowth.

Love is love.

1.3.7. Sexual interest in women

Healthy sexual desire is often associated with hormonal balance, emotional connection, and physical well-being. But there is one factor that has long been overlooked: **the gut flora**. New research suggests that the microbiome—the billions of bacteria in our intestines—plays a subtle but powerful role in regulating sexual desire in women.

Altered gut flora in women with low libido

Studies show that women with **a reduced libido** have an abnormal composition of their gut flora compared to women without sexual complaints [1]. Certain bacteria appear to be more or less present, suggesting that **microbial substances can influence mood, motivation, and sexual interest**.

This opens up the possibility that **targeting the gut flora** through diet, supplementation, or lifestyle—if carefully supervised—could also have a positive effect on sexual well-being.

What does research on female mice teach us?

A striking observation was made in animal models:

When **female mice were given antibiotics**, their gut flora was disrupted – reducing **their sexual interest in males**[2]. This does not seem to be a coincidence, but rather an evolutionary protective mechanism. In nature, it is vitally important that offspring **are colonized with a healthy microbiome**, which they receive from their mother.

If a mother animal has disturbed intestinal flora, a temporary decrease in sexual behavior would **reduce** the chance of a new generation with the same imbalance. This is a remarkable example of how nature uses the microbiome to control not only the body, but also behavior and reproduction.

Possible explanations

The influence of the microbiome on sexual desire could occur via:

- **Neurotransmitters** such as dopamine and serotonin, which are involved in pleasure, motivation, and mood
- **Hormonal pathways** via estrogen metabolism in the intestines
- **Inflammatory status**: low-grade inflammation is linked to depression and reduced sexual desire
- **Stress regulation via the HPA axis**, which is closely linked to the microbiome

Valuable additions: the cycle and gut flora

- The **microbiome changes with the female cycle** – in the luteal phase (after ovulation), certain bacteria become more active.
- Disturbed intestinal flora can contribute to **PMS, mood swings**, and loss of libido.
- **Vaginal flora** is also directly influenced by the gut microbiome – crucial for comfort and desire.

Conclusion

Sexual desire is an interplay between body, mind, and bacteria. In women, the microbiome plays an often underestimated role in the subtle coordination of hormonal signals, brain activity, and mood. By nurturing the gut microbiome, we not only ensure digestion and immunity, but also zest for life, connection, and the desire for intimacy.

1.3.8. Healthy digestion

Digesting food seems like a purely physical process—but without your gut microbiome, it would hardly function at all. Your bacteria help break down, absorb, and utilize nutrients, and they also communicate with your hormones, nerves, and immune system.[5]-[1]

Energy absorption and fatty acids

The microbiome is essential for the breakdown of indigestible fibers and other macronutrients. This produces short-chain fatty acids (SCFAs), such as butyrate and propionate. These substances supply energy to the intestinal cells, strengthen the intestinal barrier, and help control inflammation.[2]-[6]

Protection of the intestinal wall

A healthy microbiome supports the **structural integrity of the intestinal mucosa**. This allows nutrients to be better absorbed and reduces the chance of unwanted substances penetrating the intestinal wall.[3]

Balance and communication

Intestinal bacteria communicate with the brain, adrenal glands, and immune system via the so-called gut-brain axis. [5] This communication is necessary to control digestion, coordinate bowel movements, and regulate hunger.

What happens when the microbiome becomes unbalanced?

Dysbiosis (disturbance of the intestinal flora) makes this system vulnerable. The risk of digestive complaints such as bloating, diarrhea, or constipation increases. [4] Prolonged dysbiosis can even lead to irritable bowel syndrome (IBS) and inflammatory diseases such as ulcerative colitis or Crohn's disease. And what about antibiotic-induced dysbiosis? This can cause permanent damage to the composition and resistance of your flora.[5]

1.3.9. Growth

The microbiome—the community of bacteria in the intestines—influences:

- how well food is absorbed
- how efficiently nutrients are utilized
- how susceptible the body is to inflammation

Children with healthy, diverse gut flora show better growth patterns on average than children with disturbed gut flora, also known as dysbiosis.

In developing countries, dysbiosis is recognized as an important factor in growth retardation and malnutrition, and interest in this link is also growing rapidly in Western countries.

Good bacteria, better growth

Some bacteria are particularly valuable for growth, such as Bifidobacterium and Lactobacillus species.

These are naturally present in the intestines of healthy infants, especially when they are exposed to a wide range of maternal bacteria through vaginal birth and breastfeeding, depending on the state of the microbiome[3].

Children with greater microbial diversity tend to grow more steadily, especially in the first year of life.

There is evidence that the microbiome develops differently in boys and girls, which can have subtle effects on their growth and development.

Probiotics as support

Some studies show that probiotic supplementation—for example, with Bifidobacterium animalis ssp. lactis BB-12—can improve growth in children, especially those at risk of growth retardation.

Probiotic baby food also appears to have a positive effect on the composition of the gut microbiome and on height growth in young children.

Impact of antibiotics

Antibiotic use in the first year of life is associated with:

- reduced growth in boys [8]
- an increased risk of obesity later in life, in both girls and boys [9]

All the more reason to carefully consider antibiotics and to optimize the microbiome in a timely manner in order to prevent the use of antibiotics.

1.3.10. The skin

Radiant skin does not start in the bathroom, but... in your intestines. It may seem surprising, but **the condition of your skin often says something about the balance in your gut microbiome**. The connection between the intestines and the skin – also known as the *gut-skin axis* – is becoming increasingly well understood. More and more research confirms that a disturbed microbiome can be the cause of skin conditions such as **eczema, acne, rosacea, and psoriasis.**

Dysbiosis and inflammatory skin conditions

Dysbiosis—an imbalance between good and less beneficial bacteria—causes inflammatory reactions in the body. These can manifest themselves in the skin. Studies show that people with