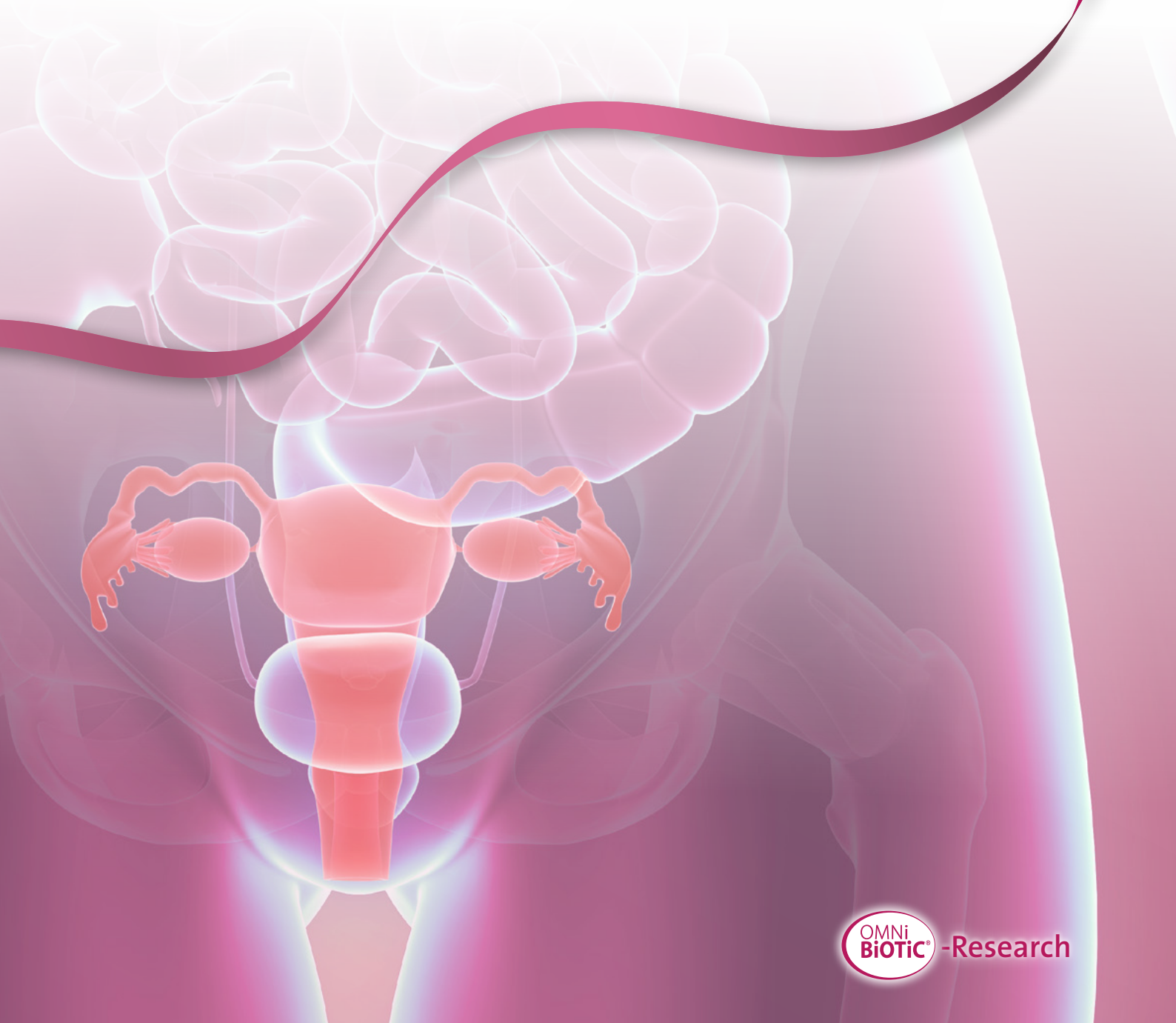
A GUIDE TO

The Female Microbiome



OMNi BiOTiC® -Research

Contents

Women's **Health** –
The Female Microbiome

A woman's vaginal flora is an important protective shield against harmful germs. In a healthy vaginal flora, billions of different beneficial Lactobacilli – also called lactic acid bacteria – colonise the vagina and ensure an acidic pH value (3.8–4.4).

In this environment, pathogenic germs and fungi cannot multiply and therefore do not penetrate the genital area, bladder, urinary tract or reproductive organs.

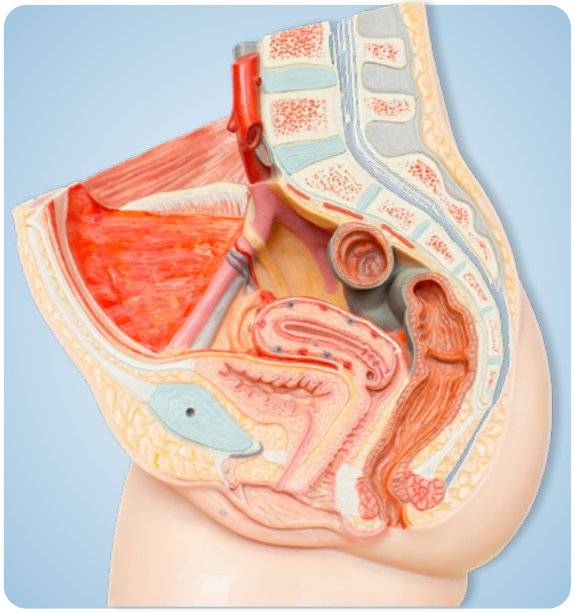
However, the delicate balance of the vaginal flora can quickly become unstable. If the lactic acid producers are reduced, the pH value in the vagina changes and pathogenic bacteria and fungi gain the upper hand – an imbalance (= dysbiosis) develops.
The most common triggers for intimate infections are bacteria such as ***Escherichia coli*** (for urinary tract infections) or ***Gardnerella vaginalis*** (for bacterial vaginosis), and fungi such as ***Candida albicans*** (for vaginal mycosis).

The connection between intestinal and vaginal flora

The development of the vaginal flora starts right from birth through the oral intake of beneficial bacteria. These important symbionts know exactly where they need to go in the human body and can reach their place within a very short time.

So how do bacteria from the intestine get into the vaginal area? This can be explained by taking a look at the female anatomy: If you look at the pelvis in cross-section, you can see that the anal area or rectum, vaginal area and urinary tract are not "tight", closed systems, but open out into orifices.

Between the anal and vaginal areas there is a "pathway": Via this physiological pathway, Lactobacilli are transported from the rectum, which serves as a reservoir for useful lactic acid bacteria, forward into the vagina. If the intimate area is out of balance or if you have an infection, then it is crucial to reintroduce precisely those **bacteria** orally **in the form of probiotics.** This ensures that the vagina is colonised again in the shortest possible time, restoring a healthy vaginal flora.



A closer look at:

Bacterial Vaginosis and Vaginal Fungus

On average, there are about 2 billion bacteria per cubic millimetre of vaginal epithelium in a woman's vagina. Most of them are pure lactic acid bacteria which, by maintaining an acidic pH value in the vagina, form a protective shield against harmful microorganisms and maintain the balance of the vaginal flora.

What is meant by "balance" of the vaginal flora?

A "balance" in the vagina refers to the healthy colonisation of the vagina, in which the area is predominantly colonised by beneficial lactic acid bacteria and unwanted germs are therefore kept at bay.

The lactic acid bacteria regulate the pH value, which in a healthy vagina is in the acidic range of between 3.8–4.4. If the pH value changes, this creates optimal living conditions for harmful fungi and germs, while at the same time the beneficial Lactobacilli are reduced.

This leads to an imbalance (dysbiosis) and the vagina loses its protective shield. Pathogenic germs can get the upper hand and cause bacterial vaginosis or vaginal fungus, among other things.

Difference between bacterial vaginosis and vaginal fungus

There are multiple key differences here between bacterial vaginosis and vaginal fungus. One of them is that a fungal infection (vaginal mycosis, otherwise known as thrush) is an infectious disease and bacterial vaginosis is a disorder relating to the natural bacterial colonisation. Bacteria are living organisms and they can survive on their own. Whereas fungi need a host cell to reproduce and survive. As the names suggest, bacterial vaginosis is caused by bacteria and vaginal fungus by fungi. Both diseases can break out when the vaginal flora is disturbed and if there are too few "good" bacteria.

Bacterial Vaginosis

If the pH value in the vagina is disturbed, i.e., not in the optimal acidic range, harmful germs can make their way into the vagina and multiply very easily.

This excess of bad bacteria, such as *Gardnerella vaginalis,* the main pathogen relating to bacterial vaginosis, causes the lactic acid bacteria to be displaced, meaning that other pathogens can spread unhindered. It is at this point where you will start to feel discomfort and you may already notice other symptoms.

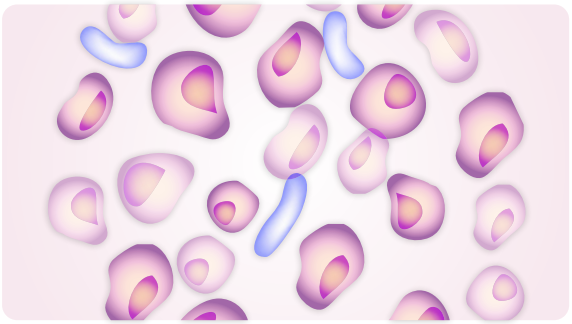
Typical symptoms of bacterial vaginosis are itching and a thin, white-greyish discharge with a fishy smell. This unpleasant odour is caused by amines, which are formed when *Gardnerellae* break down proteins.

Vaginal Fungus (Thrush)

Thrush is one of the most common fungal infections in women.

This is caused by yeast fungi, most commonly by *Candida albicans.* It is estimated that three out of four women contract a viral fungus infection at least once in their lives.

Common symptoms that occur with a fungal infection are itching, a burning sensation in the vagina, an increased amount of white/yellow coloured crumbly discharge, as well as pain during intercourse. Sometimes the urethra is also affected and it hurts when urinating. In contrast to bacterial vaginosis, the Lactobacilli (lactic acid bacteria) are not reduced and the smell of the discharge is not fishy, but normal.



Graphic: *Gardnerella vaginalis*

Graphic: *Candida albicans*

Symptoms of Bacterial Vaginosis and Vaginal Fungus (Thrush)

Bacterial Vaginosis	Vaginal Fungus (Thrush)
• Fishy intimate odour	• Normal smell
• White-greyish, thin discharge	• White-yellowish, crumbly discharge
• Worsening of symptoms after sexual intercourse or menstruation	• Pain during sexual intercourse
• No swelling of the labia	• Swelling of the labia
• No vaginal redness	• Redness of the vagina
• Bacteria: *Gardnerella Vagnalis*	• Fungus: *Candida albicans*

What causes an imbalanced vaginal flora?

There are many different causes of an imbalanced vaginal flora. Our vagina is not a bacteria-free zone, quite the opposite as it is populated with natural, good bacteria. Lactobacilli are the main inhabitants of the vaginal mucosa and these convert the sugar that comes from the vaginal cells into lactic acid, creating an acidic environment. In this acidic environment (pH value between 3.8 and 4.4), pathogenic germs have a difficult time multiplying or spreading. Why exactly the vaginal flora becomes imbalanced is often very difficult to say. However, there are some common factors that can play a role in this.

1. **Hormonal changes can influence the vaginal flora:** Hormonal changes are often a reason for an imbalanced vaginal flora. The hormone estrogen is a very important hormone that determines the number of Lactobacilli in the vagina. If the estrogen level in the vagina is low, for example during and after your period, then the number of lactic acid bacteria are also reduced. Hormonal contraceptives such as the "pill" can promote an imbalance in the intimate area.

2. **Antibiotics destroy "good" bacteria:** Sometimes the use of antibiotics is necessary. However, as antibiotics also destroy the "good" bacteria in the body, they are disadvantageous for our gut and therefore also our vaginal flora. Therefore, it is always recommended to rebuild not only the intestinal flora but also the vaginal flora with probiotics after taking a course of antibiotics.

3. **Excessive hygiene affects the pH value of the vagina:** Of course, hygiene is important for intimate health and well-being, but we should not overdo it. Many shower gels are not suitable for cleaning the intimate area and can influence the pH value of the vagina. It is sufficient to use water or ph-neutral care products that are especially suitable for the intimate area.

4. **Synthetic underwear can affect the balance:** It may be hard to believe, but even our underwear can negatively affect the vaginal area. Synthetic fabrics create a warm and humid environment which promotes the growth of fungi and bacteria. The next time you go shopping, make sure you look out for cotton underwear.

5. **Stress affects our whole body:** Stress is a well-known factor that can negatively affect all areas of our body. It can also be the reason for an imbalance of the vaginal and gut flora and can therefore promote the development of infections. A permanent psychological burden can therefore actually be a trigger for many different conditions.

6. **An imbalanced diet:** You are what you eat – this doesn't just apply to your waistline, but to your vagina too. A disturbed gut flora can affect the balance of your vagina. Sugar, for example, can be a food source for the harmful microorganisms in the body, which helps them to multiply more easily.

7. **Taking probiotics for the vaginal microbiome:** The vaginal flora is mainly colonised by Lactobacilli. If these are outnumbered, then the microbiome is in a state of imbalance and therefore vulnerable to pathogenic germs.

Probiotics are "living" bacteria that are found in certain foods or are available as special products in pharmacies. These contain specially selected strains of bacteria destined for specific areas of the body. For the vaginal flora, it is advisable to use a probiotic consisting of various Lactobacilli strains in order to regulate the vaginal flora and to ensure the preservation of the natural vaginal microbiome.

The gut and vaginal flora are closely related and have a significant impact on the entire body. It is therefore essential to take infections seriously and always make sure that antibiotics are only taken when necessary.

If you suffer from diarrhoea or constipation, this also affects the vagina. Since the intestine serves as a reservoir for bacterial colonisation of the vagina, it is also important to consider the health of your vaginal flora.

Vaginal Infections in Childhood

Genital infections are among the most common in paediatric gynaecology. About 30 % of girls suffer from inflammation of the external genitalia (vulvitis), inflammation of the vulva and vagina (vulvovaginitis) or have to see a doctor when suffering with unexplainable discharge. Vulvitis typically develops as a result of inadequate genital and faecal hygiene in a phase of life in which young girls are brought up to act independently in this respect.
Symptoms of vaginitis include redness around the vulva and a yellowish-greenish, sometimes bloody vaginal discharge. In addition to the usual treatment, it is recommended to support the vaginal flora with lactic acid bacteria. Drinking probiotics targeted for vaginal health is an ideal form of application, especially for children.

Vaginal **Flora** & **Sex** –
How are they connected?

Every woman has her own microbiome in her vagina. This consists mainly of Lactobacilli, also called lactic acid bacteria.

The sugar found in the vaginal cells is converted into lactic acid by these Lactobacilli, which maintains the acidic environment in the vagina. However, what many people do not know about is the connection between the vaginal flora and sexual intercourse! This is because during sex, the bacteria are exchanged and also mixed with those of the partner. What then happens in the vaginal microbiome depends on how the existing bacteria in the vagina react to the partner's "new" bacteria. Pathogenic germs can also be transmitted which may trigger various infections in the body.

Body fluids, such as semen, which are exchanged during sexual intercourse, can also change the pH value of the vagina because they are alkaline. The vaginal pH therefore increases and is no longer acidic. If the environment changes, the balance of the microbiome is also disturbed. This is usually the trigger for bacterial vaginal infections in women. Normally, however, the vaginal flora can restore the protective acidic environment quickly enough after sex so that permanent protection remains.

What is honeymoon cystitis?

The connection between bladder infections and sex is painfully familiar to many women. Honeymoon cystitis is an inflammation of the bladder caused by sexual intercourse. In the past, many women traditionally had sex for the first time on their wedding night and suffered from the typical symptoms of cystitis afterwards, such as frequent urination and burning sensations when urinating.

Nowadays, there are still many women who suffer from honeymoon cystitis. More frequent sex, such as that experienced during the honeymoon for example, puts more strain on the genital area during sexual intercourse and increases the risk of urinary tract infections or other diseases of the urogenital tract in women.

The cause of such a disease is usually the body's own intestinal bacteria, especially the *Escherichia coli* bacteria.

This is because during sexual intercourse, bacteria can be spread from the woman's anal area into her urethra. These bacteria then rise into the bladder and irritate the bladder wall, triggering inflammation. In general, a new sexual partner always increases the risk of cystitis. This is because the woman's bacteria are not familiar with the partner's microorganisms and the immune system only adjusts to new microbes after some time.

PATHOGENIC BACTERIA

Find out more about pathogenic bacteria on page 10!

What causes recurrent cystitis?

When a bladder infection has finally subsided, unfortunately it is often the case that the next one follows rather quickly. Around one in four women suffers from recurrent bladder infections. Researchers have discovered the reason for this. Experiments with mice showed that two types of bacteria are responsible for these recurring inflammation – namely *Escherichia coli* and *Gardnerella vaginalis*. *Escherichia coli* enters the urinary tract from the intestine via the vagina and nests in the bladder wall. They are so well hidden there that they cannot even be attacked by antibiotics or detected by the body's own immune system. However, if the bacteria *Gardnerella vaginalis* comes along, then the *E. coli* bacteria are activated again. It has also been scientifically proven that there are bacteria that trigger infections but are no longer present in the body at the time of the outbreak of the disease.

How can I prevent cystitis?

There are several ways to prevent cystitis. It may already help if the woman goes to the toilet immediately after sex, because the bacteria are flushed out straight away. Another preventive measure is to keep the abdomen warm. If the abdomen is not kept warm, then the immune defence is inhibited and the bodies own bacteria are weakend.

Proper intimate hygiene is also very important. The rule here is to avoid intimate care that alters the pH value. It is sufficient to clean the intimate area once a day with warm water. Regarding intimate hygiene during sexual intercourse, alternating between anal and vaginal intercourse is also not advisable, as this allows the bacteria from the anus to enter the vagina. The intake of probiotics can have a supporting effect on the vaginal flora. It can be positively influenced by selected strains of bacteria, which have a positive effect on the vagina. These strains are predominantly Lactobacilli, which promote lactic acid production in the vagina. Lactic acid ensures that the acidic environment is maintained and that the vagina is protected.

One option may be to use vaginal suppositories that contain lactic acid or lactic acid bacteria, but many women find inserting them vaginally unpleasant and they tend to restrict sexual intercourse. Suppositories also tend to cause more discharge, which is why some women may choose to wear a panty liner when they use them too. Taking **probiotics** orally, on the other hand, is much easier, more convenient and also more hygienic.

How is cystitis treated?

Cystitis is usually treated with antibiotics. The antibiotic causes the symptoms to subside quickly and the pathogens disappear completely from the body. The antibiotic destroys not only the pathogens that are the cause of cystitis, but also other good bacteria that are important for the body. Often prescribed with an antibiotic are painkillers and antispasmodic drugs, which can also have a negative effect on the microbiome. It is advisable to support the intestinal and vaginal flora with probiotics during the period of taking antibiotics in order to replenish the health-promoting bacteria strains again.

A closer look at:

pathogenic bacteria

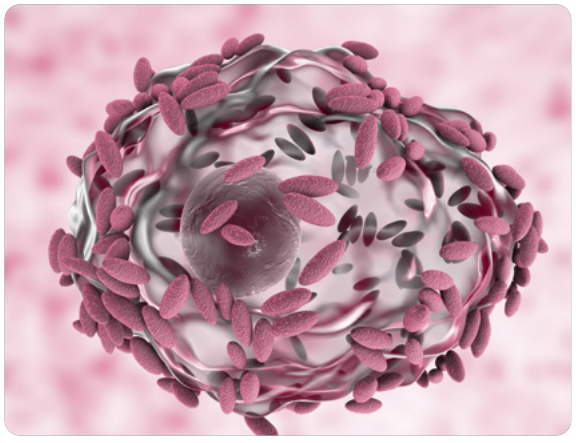
Gardnerella vaginalis

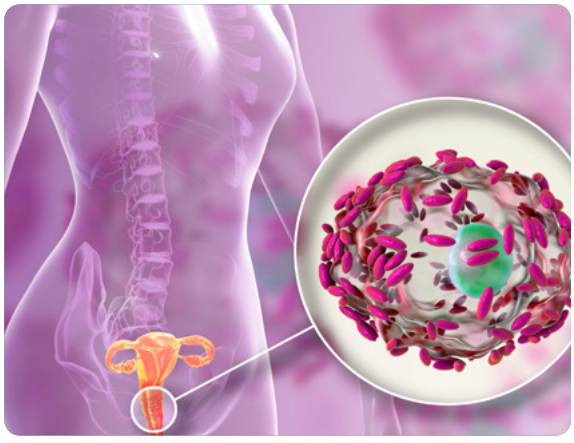
Gardnerella vaginalis is a rod-shaped bacterium that is part of the normal, physiological vaginal flora in small quantities.
If the vaginal environment becomes imbalanced, namely if too few lactic acid bacteria colonise the vagina, gardnerellae take over and cause symptoms such as burning, pain, swelling and unpleasant-smelling, foul, fishy discharge.

In this case, we speak of bacterial vaginosis, a microbial infection of the vagina.

In most cases, *Gardnerella vaginalis* is not the sole culprit of such an imbalance, but rather part of a mixed infection caused by other bacteria, such as *Bacteroides spp.* or *mykoplasma*. The diagnosis is usually made by swabbing the vagina and looking for cells surrounded by rod-shaped bacteria (clue cells).

An infection caused by *Gardnerella vaginalis* can ascend via the uterus into the fallopian tube and cause severe inflammation if it is not treated in time.

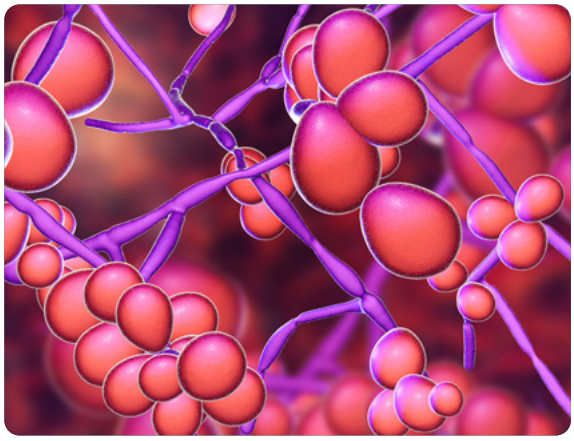


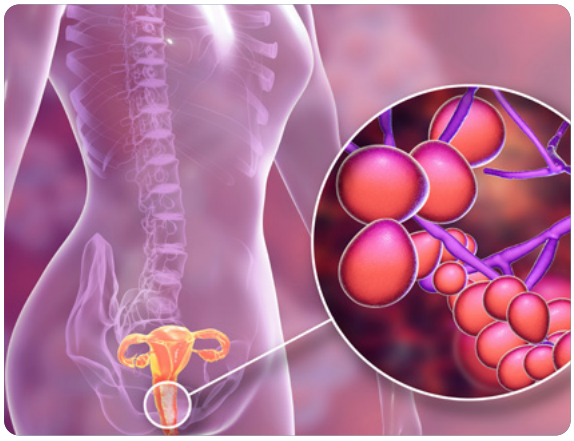


Candida albicans

The yeast *Candida albicans* is the most common cause of fungal infections in the intimate area. This usually affects the external genital area and the vagina, which is why it is often referred to as vulvovaginal candidiasis. Fungal infections of this type are found both in women as well as men and they are also transmissible through unprotected sexual intercourse. Like all fungi, *Candida albicans* prefers a warm, humid environment and the fungi can survive even unfavourable living conditions due to spore-forming properties.

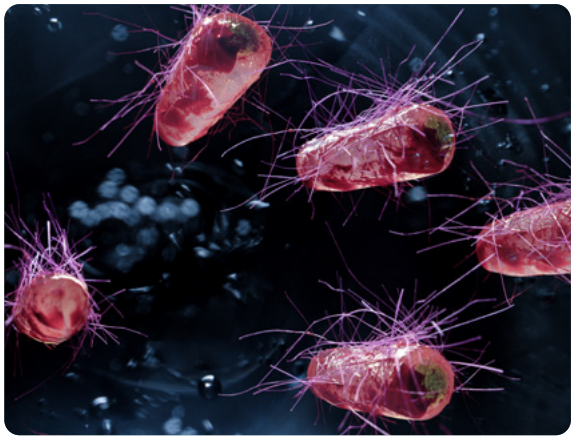
Fungi colonise the skin and mucous membrane of the vagina, oral cavity and gastrointestinal tract and are therefore part of the healthy flora. If they remain in a natural balance with our body, they do not trigger any problems. However, if the healthy flora is lost due to excessive hygiene, stress, hormonal imbalances, or if the immune system is unbalanced due to changes in the immune system or an immune deficiency, *Candida albicans* can multiply rapidly and be responsible for the classic symptoms of a fungal disease such as redness, swelling, itching and creamy or crumbly discharge.





Escherichia coli

Escherichia coli is a bacterium that is part of the healthy intestinal flora. If the vaginal flora is not sufficiently populated with *Lactobacilli, E. coli* bacteria can be carried from the intestine into the vagina and urinary tract and cause infections, especially urinary tract infections. The bacterium can lodge in the bladder wall after infection and remain in this hiding place. The *E. coli* bacteria are inaccessible at this point for antibiotics and the immune system. Often there are no noticable symptoms at this point. However, if *Gardnerella* are present in the vaginal microbiome in addition to the *E. coli* bacteria, they can attack the upper layer of the bladder wall and release the *E. coli* – the bladder infection flares up again and paves the way for a chronic urinary tract infection.



Contraceptives & Vaginal Flora

The Pill

Many women report that the "pill" promotes the occurrence of vaginal fungal infections and vaginal dryness.

The reason for this may be the hormones of the contraceptive pill or a reduced amount of oestrogen. This is because this hormone ensures the build-up and regeneration of the vaginal mucosa, and in addition, when the oestrogen level is high, the sugar level also increases (in the form of glycogen) in the vagina. The glycogen in turn serves as a basis for the useful lactic acid bacteria to multiply. At the same time, it is metabolised by the Lactobacilli to lactic acid, which ensures the favourable, acidic pH value in the vagina. Therefore, a higher level of oestrogen is beneficial for the vagina, whereas a low concentration of this hormone is not.

Hormone and Copper IUD

The hormonal IUD is a contraceptive that is used worldwide. Like any medication, contraceptives such as the hormone-releasing intrauterine device (IUD) have undesirable effects and side-effects, especially because the IUD is a continuously present foreign body in the uterus.

Does an IUD increase the risk of fungal infections?

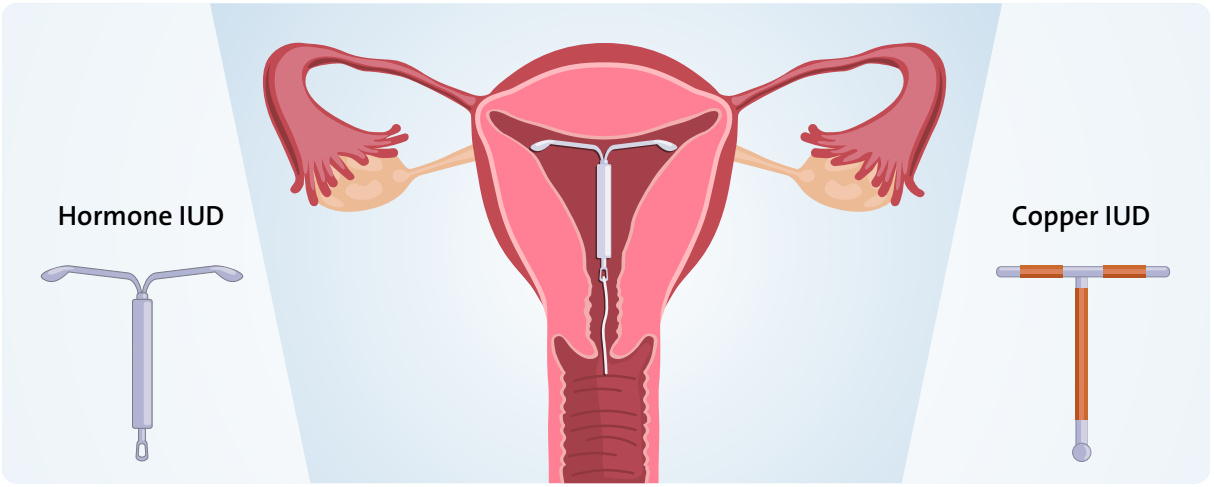
Some studies have already looked into the question of whether foreign bodies introduced into the body lead to an increased susceptibility to fungal infections. One study, for example, showed that the use of such contraceptive methods clearly alters the microbiome in the cervix and vagina and that the women concerned are at higher risk of infections. Statistically, women who have an IUD have an 8-fold increased risk of infection in the first month compared to women without an IUD. In the first four months after insertion, the risk is increased by a factor of 4.

Is copper problematic?

In the case of copper IUDs, the antibiotic effect of the released copper ions may be problematic. Copper not only affects the motility and viability of sperm, but also kills bacteria, including good bacteria, when it comes into contact with them. It can be assumed that the development of an infection that occurs shortly after the insertion of the IUD is influenced by several factors and the antibacterial copper ions can contribute to this. This is especially true for women who already have mild or minor infections or are on the verge of vaginal dysbiosis.

Vaginal bacteria to support the vaginal flora

The vaginal microbiome is dominated by *Lactobacillus* bacteria and is an important component in the defence against pathogens. Changes in the vaginal flora can therefore be associated with an increased risk of bacterial vaginosis. Both as a preventive measure and for the acute treatment of vaginal infections, it is recommended to build up a healthy vaginal microbiome by administering a supplement containing bacterial strains found naturally in a women's vagina, such as *Lactobacillus crispatus, Lactobacillus ramnosus, Lactobacillus gasserii* and *Lactobacillus jenseneii.*



The connection between infertility & vaginal flora

Approximately every sixth couple in Austria has an unfulfilled desire to have children, although the reasons for these problems conceiving are still not clear. Unsuccessful fertility treatment is an extreme psychological burden for those affected. Besides age as one of the main factors, the composition of the vaginal flora could also be a possible cause of unexplained infertility. Scientific studies have already shown that the vaginal flora of pregnant and non-pregnant women differ in composition and stability, which indicates that the vaginal microbiome has an influence on fertility and birth.

The vaginal microbiome consists of around 250 different bacterial species. An important finding is that the mucous membrane of the uterus is not sterile but colonised by bacteria, which have a significant influence on a woman's fertility. According to studies, an imbalanced bacterial colonisation can hinder the implantation of the fertilised egg. A Spanish research team has studied the microbiome of healthy pregnant women for the first time. The results showed that the microbiome of a large proportion of the healthy women studied consisted of over 90 % Lactobacilli.

The presence of other germs or a lack of Lactobacilli can significantly reduce fertility. It is interesting to note that with a *Lactobacillus*-dominated microbiome in the uterus, embryo implantation was already 60.7 % successful at the first artificial insemination, but only 23.1 % with a *Lactobacillus*-reduced microbiome. The rate of successful pregnancy decreased from 70.6 % to 33.3 % with a deficiency of Lactobacilli and the proportion of live births decreased from 58.8 % to 6.7 %.[1]

In recent years, the use of probiotics has become increasingly important in gynaecological practice for the treatment and prevention of negative changes in the vaginal flora and recurrent infections of the urinary and vaginal tract. In recent years, microbiome research has made it possible to find specifically efficient strains of bacteria for gynaecological diseases.

It was clearly demonstrated that the optimal form of administration is oral ingestion of probiotic bacteria, as this is the natural way of colonising the vagina with the corresponding microbes. In contrast to the administration of vaginal capsules, the immigration of these probiotic bacteria via the intestine results in the formation of a depot in the intestine, which creates a reservoir for the permanent colonisation of the vagina.[2]

[1] Moreno I. *et al.*, Evidence that the endometrial microbiota has an effect on implantation success or failure, Am J Obstet Gynecol 2016;215(6):684-703

[2] Kaufmann U *et al.*, Ability of an orally administered lactobacilli preparation to improve the quality of the neovaginal microflora on male to female transsexual women, Eur J Obstet Gynecol Reprod Biol 2014;172:102-5.

Vaginal **Dryness**

Symptoms and signs of vaginal dryness

A milky-white to clear fluid is produced daily in the vagina, which is also known as “vaginal discharge”. A healthy discharge has a creamy white consistency and is odourless.

A vagina that is too dry becomes noticeable if the vaginal area itches, burns and hurts during sexual intercourse. The main function of vaginal discharge is to protect against pathogens, but also to allow easy and painless penetration of the penis during sexual intercourse.

When aroused, the vagina releases a viscous fluid that makes sexual intercourse pleasant for both woman and man and protects against injury.

Who is affected by vaginal dryness and what causes it?

Vaginal dryness affects both young women who are sexually active and those who are going through menopause.

The glands located in the vaginal mucosa produce a mucus under the influence of oestrogen that keeps the vagina moist and the amount varies depending on arousal and a woman’s monthly cycle. The lack of mucus or moisture is then called “vaginal dryness”.

There are many reasons why your vagina may become dry. Many of these can be traced back to a disturbed microbiome, i.e. an imbalance of bacteria in the vaginal flora.

Cause:

Menopause: One of the best-known causes of vaginal dryness is the menopause. This is caused by a reduced production of the female hormones oestrogen and progesterone. Due to a lack of oestrogen, the vaginal epithelium is no longer built up and the vagina loses its protection.

FIND OUT MORE

You can read more about the menopause on page 17.

Pregnancy and breast-feeding: Due to hormonal fluctuations during pregnancy, vaginal dryness may occur, but this is for a limited time. The mucous glands are affected for a while after birth, but recover after about six to eight weeks.

Hormonal contraceptives: Younger women may also be affected by vaginal dryness. Especially those who use low-dose hormonal contraceptives. These irritate the body so that it may no longer produce enough of its own oestrogen, resulting in a drop in oestrogen levels.

Insufficient sexual arousal: If a woman is not sufficiently aroused, the vagina is not moistened enough. This can cause pain and burning when the penis penetrates the vagina.

Incorrect intimate hygiene: The lack of or excessive intimate hygiene, intimate washing lotions, sprays or vaginal rinses containing irritating substances such as soap, silicones, parabens and perfumes are also a reason for an imbalance in the vaginal flora, which in turn can cause vaginal dryness.

Health conditons and infections: There are various health conditions that can also be the cause of vaginal dryness. These include, for example, diabetes, kidney or liver damage, thyroid disorders, depression or high blood pressure. A previous fungal infection can also be to blame for vaginal dryness.

Treatment options for vaginal dryness

There are many different causes of vaginal dryness, so the form of treatment also depends on the trigger. There are already lots of good remedies that help acutely against vaginal dryness, for example artificial lubricants, moisturising gels for the vagina or the natural variant – coconut oil.

However, there are also studies that show that taking probiotics specifically designed for the vaginal flora has a positive effect on vaginal dryness in the long term. Generally making sure you drink enough can also have a beneficial effect on the vaginal moisture.

Microbiome and the menopause

The menopause describes the time of hormonal change in a woman around the age of 50, whereas the premenopause begins between the ages of 40 and 50 and this is the first phase of hormonal change. Hormone production in the ovaries begins to decrease and the first cycle irregularities occur.

The premenopause is followed by the perimenopause – a phase that begins at the age of about 50 and is accompanied by the absence of menstruation. This time is also known as the menopause and can often only be precisely determined in retrospect.

During this period, the reduced production of oestrogen, androgens and corpus luteum hormones can cause noticeable mental and physical symptoms such as hot flushes, sleep disorders, loss of libido or dry mucous membranes.

Postmenopause describes the last phase of the menopause, which begins exactly one year after the last period. The body slowly adjusts to the new hormonal levels and the symptoms become reduced. However, the end of the postmenopause varies from woman to woman and depends on both the hormone status and the symptoms.

Gut microbiome during menopause

Not only the ovaries, but also our intestinal flora seem to have an influence on the production of female sex hormones and vice versa, according to the latest research findings.

The composition of the intestinal bacteria is strongly dependent on environmental influences, diet, stress, the intake of antibiotics and hormones. In fact, the intestinal flora shows the highest instability in life stages where lots of changes are happening in the body (childhood, puberty, ageing process). In addition to oestrogen, the amount of progesterone also decreases during the menopause. The reduced progesterone level has a direct effect on the intestinal barrier function and impairs it negatively. In addition, studies have shown that there is an increased *Firmicutes-Bacteroidetes* ratio in the postmenopausal period. These observations are consistent with the increasing body mass index (BMI) of many women at this stage of life.

Another change in the gut microbiome that becomes apparent during the menopause is the reduced production of short-chain fatty acids, which is involved in the regulation of appetite and energy metabolism. Therefore, some major symptoms of menopause are related to a bacterial imbalance in the gut.

Probiotics during the menopause

Not only our intestinal bacteria, but also the bacterial composition of the vaginal flora changes over the course of our lives. In the pre-menopause phase, a healthy vaginal flora is mainly colonised by Lactobacilli.

After the onset of menopause and the decrease in oestrogen levels, the pH value rises slightly. Also influenced by the low oestrogen level, the amount of glycogen decreases, which in turn has a negative effect on the growth of Lactobacilli.

A dysbiosis of the vaginal flora and an increased occurrence of *Proteobacteria, Streptococcus* and *Anerococcus* are the result. By taking a probiotic consisting of Lactobacilli, such as **OMNi-BiOTiC® FLORA plus+,** the key bacteria that naturally occurs in the vagina can migrate down into the vagina and promote a balanced vaginal flora.

Probiotics: Oral **use** & **Supporting** the **vaginal** flora

The use of probiotics in gynaecology has become increasingly important in recent years – be it with regard to the initial colonisation of the child's intestine or in the treatment of vaginal problems.

In the development of OMNi-BiOTiC® FLORA plus+, carried out at Vienna University Hospital for Gynaecology, the selection of the right strains was crucial. Based on 127 relevant bacterial strains that are part of a healthy vaginal flora, a step-by-step selection process was carried out to identify exactly those 4 lactobacillus strains that have been shown to have a very special influence on the vaginal flora.

The selected bacterial strains are able to effectively inhibit the growth of pathogenic bacteria (*Escherichia coli, Gardnerella vaginalis*) and fungi (*Candida albicans, Candida krusei,* and *Candida glabrata*) and they settle in the vaginal area.

Natural colonisation through oral intake

A key feature of OMNi-BiOTiC® FLORA plus+ is that it can be taken orally, as this is a sustainable and natural way for probiotic bacteria to colonise the vaginal tract from the very beginning of life. In addition, drinking the probiotic is an innovative way to balance the vaginal flora naturally, without all the undesirable effects associated with topical application. Irritations caused by applicators or foreign substances in vaginal capsules and suppositories can be ruled out and the transfer of germs from hands to the vaginal area is avoided.

The effectiveness of orally intaking 4 scientifically selected bacterial strains in OMNi-BiOTiC® FLORA plus+ was investigated in a randomised, placebo-controlled study involving 60 women. The study results clearly show that taking the probiotic led to a highly significant improvement in the Nugent score[1] in 48.5 % of the probiotic group (but only in 14.8 % of the placebo group).

In addition, the probiotics group was able to document a much stronger colonisation of precisely those bacterial strains in the vaginal flora that are contained in the probiotic. This and other studies clearly prove that the Lactobacilli in OMNi-BiOTiC® FLORA plus+ are able to

- **rapidly settle in the vaginal area after ingestion, and**
- **are suitable for the dietary management of a deficiency of Lactobacilli in the vaginal flora due to hormonal influences, antibiotics or postmenopausal chemotherapy –**

all without the undesirable effects associated with local application.

[1] The Nugent score is a value for diagnosing bacterial vaginosis from a smear test.

Build up the vaginal flora after taking antibiotics

Infections in the intimate area with pathogenic bacteria are often treated with an antibiotic. This destroys the unwanted pathogens – but also the important lactic acid bacteria (= Lactobacilli), which can protect you against unwanted bacterial invaders. As this natural protective shield is missing (and the reservoir of beneficial bacteria in the intestine is also severely depleted by the antibiotic), harmful germs have an easy time re-colonising in the vaginal area and causing recurrent problems.

The importance of rebuilding the vaginal flora after taking antibiotics is shown by a placebo-controlled, double-blind study: 36 women were treated with an antibiotic for recently diagnosed bacterial vaginosis. Subsequently, half of the women received OMNi-BiOTiC® FLORA plus+ daily for 4 weeks, the other half a placebo.

The subsequent examination showed: In the placebo group, 35 % of the women were diagnosed with bacterial vaginosis again after 4 weeks. Of the women who had built up their vaginal flora after taking antibiotics with OMNi-BiOTiC® FLORA plus+, however, not one showed signs of a recurring bacterial vaginal infection!

Advantages of oral therapy

- **Easy and hygienic to use –** no additional germs are transferred from the hands to the vaginal area.
- **No additional irritation** from applicators or chemical substances from capsule and suppository casings.
- **No extra discharge –** your underwear stays clean and panty liners can stay in the cupboard.
- **Can be used** during your period.
- **No restrictions on choice of contraceptives or sexual intercourse** (time interval not required). Suitable and recommended for use **during pregnancy and while breastfeeding.**

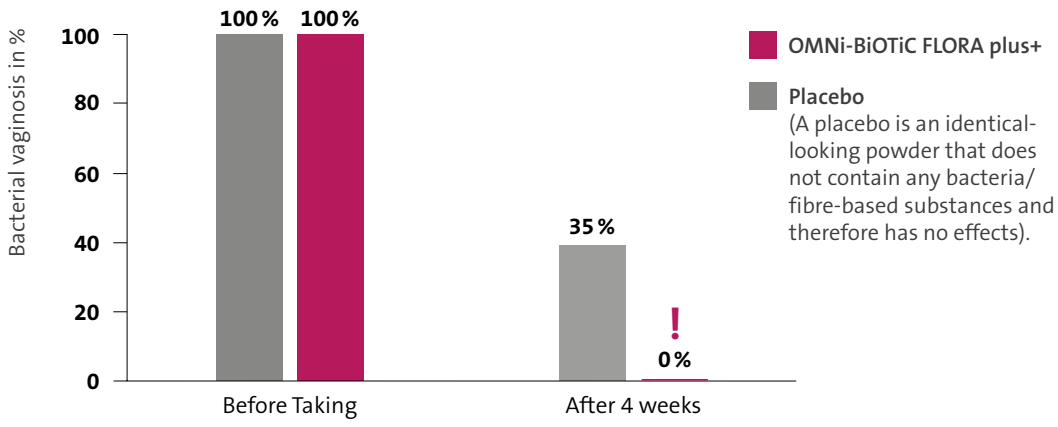


Figure: Significantly reduced recurrence of bacterial vaginosis due to colonisation of the vaginal area with lactic acid bacteria (OMNi-BiOTiC® FLORA plus+)

OMNi-BiOTiC® FLORA plus+ Finally... Vaginal flora in balance!

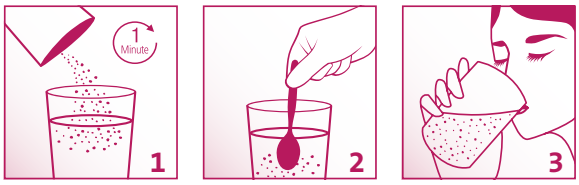
What makes OMNi-BiOTiC® FLORA plus+ so special?

The special feature of OMNi-BiOTiC® FLORA plus+ is that it is taken orally: simply drink it! From the very beginning of life, the intake of bacteria via the mouth and intestines is the natural way for beneficial bacteria to colonise the vaginal area. That is why OMNi-BiOTiC® FLORA plus+ contains only those special lactic acid bacteria that can survive the stomach passage, settle and multiply in the vagina. Like all OMNi-BiOTiC® products, OMNi-BiOTiC® FLORA plus+ contains scientifically tested symbionts only. Each portion contains 5 billion viable bacteria from 4 selected strains that occur naturally in the human body.

When can OMNi-BiOTiC® FLORA plus+ be used?

Whenever the vaginal flora is out of balance (e.g. due to hormonal changes, antibiotics or postmenopausal chemotherapy), use OMNi-BiOTiC® FLORA plus+. Such an imbalance can cause symptoms such as itching, burning, redness or changes in vaginal discharge, accompanied by an unpleasant odour, and it can lead to – often recurring – problems in the intimate area. Supporting the vaginal flora is particularly important after taking antibiotics, which not only destroys pathogenic germs but also the important protective shield of beneficial lactic acid bacteria.

How to use:
Stir 1 sachet of OMNi-BiOTiC® FLORA plus+ (= 2 g) into approx. 1/8 l water 1–2 times a day, wait at least 1 minute for the bacteria to be activated, stir again and then drink. It is recommended to take OMNi-BiOTiC® FLORA plus+ on an empty stomach. In the case of persistent, recurring or particularly severe problems, take OMNi-BiOTiC® FLORA plus+ twice a day for at least 3 to 6 months.



OMNi-BiOTiC® FLORA plus+ contains only bacterial cultures that naturally occur in the human body and is therefore ideal and recommended for use during pregnancy and while breastfeeding.

OMNi BiOTiC®

Finally...

Vaginal flora in balance!

OMNi-BiOTiC® FLORA plus+
Because vaginal health starts in the gut too. Just drink it!

Institut AllergoSan

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