

WOMEN'S HEALTH

Probiotics: A Growing Role in Women's Health

A look at strain-specific effects of lactobacilli probiotics for vaginal health. Probiotics and microbiota concepts will ultimately be translated to successful academia-industry interactions.

by Henk Hoogenkamp

An increasing number of natural ingredients are being evaluated to strengthen the armamentarium of combating vaginitis and its symptoms. Current age feminine hygiene products seek to incorporate these natural compounds like vitamin D, botanicals like aloe vera and especially probiotics for symptom alleviation.

A woman's lifecycle can be summarized as a sequence of birth, puberty, menstruation, pregnancy and meno-

pause. All these stages are hormonal influenced. At birth there are plenty of lactobacilli present that are generally provided by the estrogen of the mother. At birth, the vaginal pH of the baby girl is low and a very low infection risk therefore exists. In early childhood, the vaginal pH changes to neutral or even slightly alkaline mainly caused by deficiency of acid-producing vaginal microbes. Subsequently, the risk of infection increases. With puberty arrives menstruation and thus an increase of estrogen levels which give rise to increased production of natural occurring lactic acid. The secreted lactic acid ensures a low pH in the vagina creating a protective layer and guarding against infections. However, fluctuation of female hormones - estrogen/progesterone - often disrupts the natural pH balance allowing the harmful bacteria to grow. These imbalances can continue throughout the reproductive years.

During the (peri)menopausal years, vaginal dryness is very common due to fewer secretion of natural lubricants in the vagina. This is a normal lifecycle process: as hormone production decreases, lactobacilli and lactic acid levels drop which cause pH levels to rise to alkalinity (pH 7.0). Subsequently, the acidic protective layer of the vagina is weakened dramatically which allows harmful bacteria to overgrow the "good" bacteria.

Feminine health can be severely affected by an imbalanced microflora that often causes urinary tract infection, bacterial vaginosis and vulvovaginal candidiasis. The well-known grandmother stories of

treating urogenital infections with yogurt had more truth than modern scientists like to admit.

Self Regulating

Adult women have a vagina with a natural protective acidic layer. This protective layer continuously maintains a stable bacterial environment. In principle, lactobacilli - the good bacteria - breaks down glycogen that is secreted in the vaginal mucus. The acidic environment promotes the growth of lactobacilli, which in turn inhibits the presence or growth of pathogenic bacteria. The mucus walls continuously produce secretions and thus ensure lubrication and cleaning. By keeping a low pH environment, the lactobacilli continues to facilitate an acidic protective layer in the vagina and vulva. A healthy vagina protects its delicate areas from unwanted bacteria through these natural protective mechanisms. Vaginitis (vaginal infection) is an inflammation characterized by symptoms such as itching and burning, swelling, odor, redness, pain or abnormal vaginal discharge. Certain bacteria - fungi and protozoans - upset the natural pH balance causing irritation of the vulva and vagina. Since most girls and women are uncomfortable discussing genital infections, it is likely that a great many go untreated, causing physical as well as emotional discomfort and pain.

A vaginal microflora is a complicated and sensitive ecosystem. The microflora consist mainly of lactobacilli, which produce lactic acid. Lactobacilli stimulate the production of biosurfactants that inhibits the growth and adhesion of pathogenic bacteria. These immune modulating properties are due to the formation of lactic acid, which creates antimicrobial compounds and thus balances the ideal pH in the vaginal microflora. The lactic acid has a pH of between 4 and 5, a number that is considered essential to keep the vagina healthy. However, many internal and external variables can play havoc with the preferred acidity. The microbial ecosystem of a vagina fluctuates frequently by both hormonal and physiological changes.

Targeting Infections

Vulvovaginitis can affect women of all ages and is extremely common. Bacteria, yeasts, viruses and other parasites can cause it. But mainly it is a bacterial infection characterized by the simultaneous inflammation of the external parts of the female genital organs (vulva) and the canal from the uterus to the external opening (vagina).

- Bacterial vaginosis is the most common



› Lactacyd Revital (Sanofi Aventis) is a true cosmeceutical. It is very popular in Asia and now also emerging in the US. The active ingredients are lactoserum (milk permeate) and collagen type 1.

infection and is mainly caused by a decreased production in concentration of endogenous lactobacilli and an increase of harmful anaerobic bacteria like *E.coli*, *Staphylococcus aureus*, *Salmonella*, and *Gardnerella vaginalis*. In addition to yeast, also fungi and other harmful organisms that are normally present in non-symptomatic concentrations. The diagnosis of bacterial vaginosis is not considered a severe issue, though it certainly can affect a woman's quality of life. The diagnosis is also linked to increased risk of sexually transmitted diseases and when pregnant, can induce premature labor. Often antibiotics are prescribed to treat bacterial vaginosis. However, a relatively high recurrence rate happens which is mainly due to the failure to reestablish a normal vaginal microflora.

- Also overgrown yeast infections or vulvovaginal candidiasis (*Candida albicans*) is a frequent occurring infection and can be chronic in nature. *C. albicans* are microorganisms present in the mouth, gastrointestinal tract and vagina.
- Another urogenital infection linked to the balance of the vaginal microflora is urinary tract infection. Approximately 33 percent of women (<25 years) are affected and nearly every woman is diagnosed with this infection at least once in their lifetime. Usually urinary tract infections are treated with broad-spectrum antibiotics.

This prescription on its own can be a health hazard later in life because the high reoccurrence rate can make the body resistant to antibiotics. In addition, it is a well-known fact that antibiotics cause depletion of positive microflora in both the intestines and in the vagina.

As a scientifically proven alternative infection strategy, probiotic lactobacilli are emerging to positively influence vaginal microflora. Orally taken lactobacilli can rebalance the microflora by protecting against growth of negative harmful bacteria. For worst-case infection scenarios, lactobacilli can be used in conjunction with lower doses of antimicrobial therapy and thus causing much less stress on the remaining beneficial bacteria.

Cause and Effect

The fragile and sensitive balance is subject to the stage of life with variations such as oral contraceptives, menstrual cycle, antibiotics, tampons, sanitary liners, multiple sex partners and chronic diseases. These many internal and external factors can create a disequilibrium that often causes overgrowth of harmful (pathogenic) bacteria.

A balanced acidic environment is of importance to regulate the many functions of a vagina, including cleansing. The natural and stable natural balance can be disturbed by:

- Anticonception
- Antibiotics

Microorganisms and Women's Health

Rich strain bank of probiotics, live microorganism to address specific women's health issues:

- Bacterial vaginosis
- Intestinal (gut) health
- Immunity
- Mood irregularities
- Age-specific: pregnancy, menopause
- Urinary tract infection
- Vulvovaginal Candidiasis
- Negative overgrown microflora pathogens
 - Positive microflora > *Lactobacilli*
 - Negative urogenital and fecal microflora > *E.coli*, *Candida*, *Gardenerella vaginalis*

Nature's Goodness begins here.

Chia Oil



Fibregum™



All-natural
soluble fiber

- Excellent source of fiber
- Proven prebiotic benefits
- Exceptional digestive tolerance
- Low caloric value

Fibregum™ line of products is an all-natural and GMO free source of 90% soluble dietary fiber from carefully selected acacia tree gum. **Fibregum™** is clean label and appeals to consumers because it's 100% vegetable origin and available in organic grades. Clinical studies have demonstrated the numerous health benefits of **Fibregum™** and its prebiotic properties at a daily dose of 6-15 grams.

Fibregum™ is progressively fermented by probiotics in the intestinal tract without discomfort, making it the perfect replacement for other dietary fibers that consumers report can create gas, bloating and flatulence.

www.nexira.com
info@nexira.com

nexira
Innovation Inspired by Nature

- Excessive washing by (fragrance) soap
- Fabric softener undies
- Synthetic panties
- Daily/frequent use of tampons/liners
- Hygiene sprays
- Tight clothing/jeans
- Inadequate hygiene

Nutrition and Pregnancy

Digestion, immunity and mood are typically associated with pregnancy - both in biological and emotional terms. During this very special stage in a woman's life, not very many pharmaceutical prescriptions can be suggested. It is clear that during pregnancy women have a higher risk of urogenital infection, especially the possible associated risk factors for the fetus. In particular bacterial vaginosis is linked to increased risk of preterm birth.

Strongly related advantages of oral intake of certain lactobacilli and bifidobacteria strains affect the future health of the newborn; in particular possible avoidance of allergy developments, diabetes and impaired immune disorders. This seems especially to be the case when the newborn is delivered by caesarean section. It is estimated that in the US and EU about 25 percent women and/or doctors prefer C-section as the procedure of choice, while in China this number is close to 50 percent.

It is a fact that babies born vaginally have predominantly positive lactobacilli colonization in the gut, while C-section born babies have potentially harmful pathogenic bacteria that are typically found in hospitals and human skin. There are anecdotal reports that C-section children have increased risks to develop gluten intolerance and celiac disease later in life and are more prone to respiratory and food allergies. Finally, but no less important, scientific studies are ongoing that try to determine the link between lactobacilli/bifidobacteria probiotics and osteoporosis prevention. There are early indications that oral intake of

these probiotics increase the bioavailability of minerals in association with calcium and vitamin D and subsequently improve the metabolism.

Collagen & Elastin

Nutricosmetics contain scientifically-proven active ingredients that support physiological functions. Maintaining a youthful and healthy appearance is a common goal for a rapidly growing number of women. Not only topical but also orally taken delivery systems for nutricosmetics dietary and body-part specific are functionally-driven such as collagen and elastin peptides and other bioactive compounds.

An increasing number of natural ingredients are being evaluated to strengthen the armamentarium for combating vaginitis and its symptoms. Hydrolyzed collagen may help to support atrophied vaginal and vulva tissue. It is also thought to alleviate itching and burning which may come with vaginal atrophy and dryness associated with (peri)menopause. The latter causes lack of lubrication and may predispose the vaginal area to infection.

Next generation ingredients like hydrolyzed collagen and elastin peptides are currently under investigation pertaining their possible role in symptom alleviation. Collagen is the main component of the extracellular matrix and accounts for roughly 30 percent of the protein in the human body. It is thought that the supplementation of collagen fragments may possible induce the formation of new collagen inflamed areas. Although, with its efficacy currently under scrutiny, hydrolyzed collagen has been linked to itch and general inflammation relief of other tissues of epithelial origin. ▼

Henk Hoogenkamp is a protein specialist and Board Member of food ingredient and nutraceutical companies. His new book "Plant Protein Vision" will be published in February 2015.