

## Role of *Lactobacillus* in Vaginal Health

More than 50 different species of bacteria may live in a woman's vagina, with lactobacilli being the predominant microorganism found in healthy women. However, many factors can change the vaginal bacterial composition and decrease numbers of healthy lactobacilli including: antibiotics, menopause (or estrogen deficiency), oral contraceptives, spermicides, and/or diabetes. The idea of using probiotics for management of vaginal conditions—to replace healthy flora when they were missing—was initially suggested back in the 1920s. Since then, nearly all women have, at one time or another, been encouraged by a physician to eat yogurt to obtain small quantities of healthy bacteria through diet.

The normal vagina of a reproductive-age woman is predominately colonized with lactobacilli. These lactobacilli produce bacteriocins, hydrogen peroxide, and lactic acid. These substances lower the vaginal pH, which creates a more hostile environment for bacteria other than lactobacilli. If the number of lactobacilli falls off, the resulting increase in pH favors an overgrowth of anaerobic and facultative bacteria, which can develop into vaginitis/vaginosis.

Research into the health benefits of probiotic supplements for good vaginal health is only beginning to be explored through use of double-blind placebo-controlled trials.

### Probiotics to Maintain Vaginal Health

Recently, Ronnquist and colleagues impregnated panty liners with a particular strain of *Lactobacillus plantarum*. In women who wore the panty liners for 5 months, *Lactobacillus plantarum* was found in 86% of labial and 54% of vaginal specimens. The pH of vaginal fluid was much lower ( $P < 0.001$ ) in women that carried larger amounts of lactobacilli vaginally. This is significant because acidic conditions may prevent growth of pathogenic bacteria in the vagina. Specifically, an inverse correlation was observed between high numbers of vaginal lactobacillus and vaginal Group B streptococci. This association is especially important for pregnant women since transfer of Group B streptococci to neonates during delivery increases the risk of meningitis and other complications in newborns.<sup>1</sup>

Probiotics may also have another beneficial role in pregnant women—that of reducing the incidence of premature rupture of amniotic membranes, which causes premature deliveries. In Germany, pregnant women were encouraged to monitor their vaginal pH and if the pH rose (and became more alkaline), women were instructed to either use lactobacillus acidophilus therapy or clindamycin cream to eradicate unhealthy microorganisms and restore vaginal pH to more acidic

conditions. Fifty-eight women were treated with the probiotic and 24 women used clindamycin. Overall, vaginal pH monitoring and intervention reduced the incidence of premature births from 12.3% to 8.1% ( $p < 0.05$ ) among women identified as being at high risk. pH self-measurement was so successful in Erfurt, Germany, that the program was expanded to the entire state of Thuringia. Similarly, the expanded study also found a significant reduction of early prematurity (decrease of 1.59% to 0.99%;  $P < 0.001$ ), indicating that an acidic vaginal pH—which can be accomplished through high vaginal lactobacilli counts—plays a significant role in preventing premature births.<sup>2</sup>

Several clinical studies have also examined the effects of specific strains of orally administered *Lactobacillus rhamnosus*, *Lactobacillus reuteri*, and/or *Lactobacillus fermentum* for maintaining healthy vaginal flora. These strains have also been used as adjuncts to standard antimicrobial treatment regimens for bacterial vaginosis. Specifically, Reid and colleagues found a combination of lactobacilli strains—that even when taken orally—reduce both yeast and bacterial pathogens in the vagina and provide a superior cure rate for bacterial vaginitis when used with metronidazole, compared to use of the antibiotic alone.<sup>3,4,5</sup> Further research is needed to determine which strains provide the greatest benefits.

### Conclusion :

There is clearly potential for probiotics to help maintain good vaginal health. It is especially intriguing to note that even with use of oral probiotic products, the vaginal milieu may be beneficially modified, presumably as a result of bacterial translocation from lower portions of the intestines to urogenital areas.

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