

## The Role of Glycogen in Vaginal Health

The role of glycogen in maintaining a balanced vaginal ecosystem was first documented as early as the 1890's (1) and recognized since the 1930's (2). Glycogen is a natural energy source that is found in many places in the body – in particular it is well known that it supports positive vaginal health through the anaerobic metabolism mechanism shown in Figure 1 (3; 4; 5):

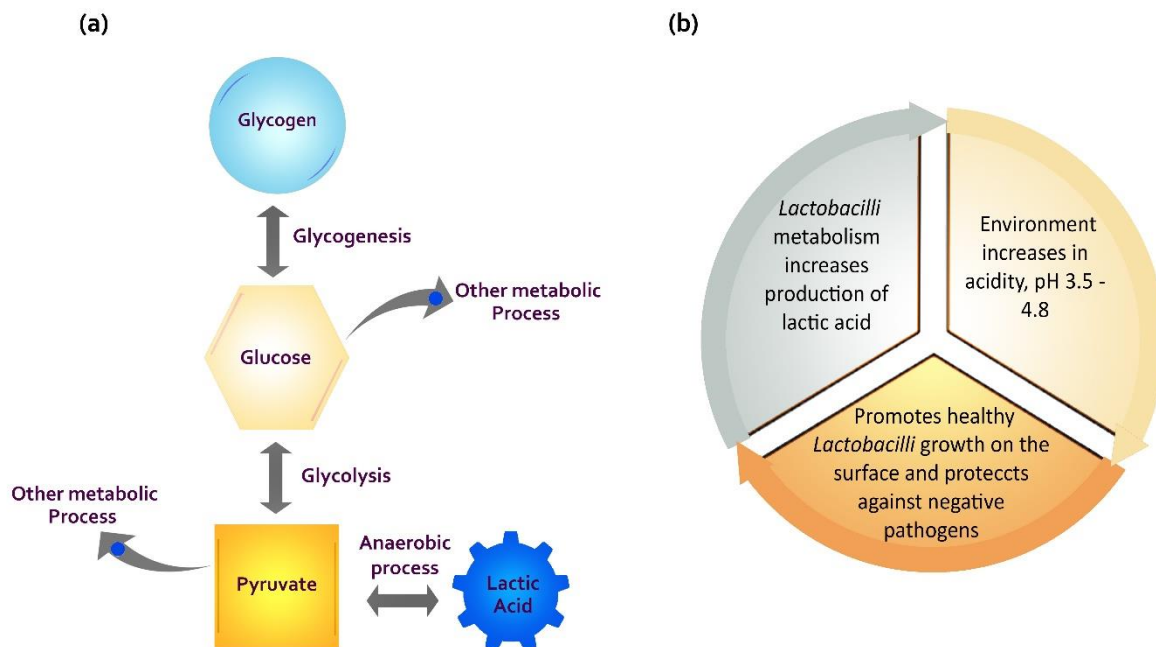


Figure 1. Simplified depiction of (a) the overall metabolic pathway from glycogen to lactic acid and (b) the role of lactic acid in vaginal health

The vagina is an environment that is nutrient-rich and full with microbiota (6; 7; 8; 9). This dynamic ecosystem continuously influences vaginal health during a women's life and natural stages (menstrual, pregnancy and menopausal) (10; 11). When healthy, this ecosystem consists of microorganisms that colonize surfaces with positive bacteria, the most common and "friendly" of which are *Lactobacilli* (12; 13). In reproductive-aged women this natural process is stimulated by the female hormone estrogen, which initiates the release of glycogen from the walls of the vagina, which is then metabolized by *Lactobacilli* to produce lactic acid (Figure 1.). This balances the pH between 3.8 and 4.5 (14), providing natural resistance to potential health risks such as bacterial vaginosis, vaginitis and common anaerobic pathogens (15; 16; 17). In addition, this acidic environment promotes the growth of more *Lactobacillus* strains allowing the cycle that creates this protective environment to continue (18; 19; 20).

During the course of natural life cycles, the levels of estrogen change and the shedding of the vaginal epithelium reduces the readily available glycogen. In light of this, the intentional introduction of glycogen can be reasonably expected to promote vaginal health, and it can be found in many vaginal health products. Historically, the most common source of glycogen used to supplement vaginal health products has been “animal glycogen” which is typically extracted from mussels, clams, oyster, slipper limpets, animal liver and muscles. Such glycogen is effective, yet it is difficult to purify and significant risks occur from the unintended presence of animal proteins (which can unleash undesired allergic reactions and create other problems). Plant-based glycogen (phytoglycogen) provides all the same benefits as animal glycogen, yet without the risks associated with the presence of animal proteins – and the added benefit of being acceptable to those who choose to use vegan or animal-free products.

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