BENEFICIAL MICROBES IN HEALTHCARE:

Many microbes are not **pathogenic** (disease-causing). Some microbes are actually beneficial to human health, including:

1. Vaginal Bacteria

The human vagina has naturally-occurring bacteria called *Lactobacillus*. These bacteria produce **lactic acid**, resulting in the vagina being acidic (pH =4).

The acidity prevents the growth of other microbes. This phenomenon called **competitive exclusion**. For example, the acidity inhibits the growth of:

- *Candida albicans* (the fungus that causes vaginal yeast infections), and

- *Gardnerella vaginalis* (bacteria that cause vaginal bacterial infections, or **bacterial vaginitis**)

When *Lactobacillus* bacteria are absent (after antibiotics, for example), vaginal infections are more likely to occur.

2. Fecal Transplantation

A human donor's healthy feces (with its naturally-occurring, beneficial bacteria) can be used to treat a patient with a **CDIFF** infection. CDIFF is an abbreviation for *Clostridium difficile,* which are pathogenic bacteria that can cause severe gastrointestinal infections.

During fecal transplantation, the donated feces is mixed into a slurry, which is then administered via a long tube into the patient's large intestine. The beneficial bacteria compete against the pathogenic CDIFF bacteria and prevent CDIFF from colonizing the intestines. This is another example of **competitive exclusion**.

The success rate with fecal transplant is 94%, which is three times better than with antibiotics!

3. Probiotics

Probiotics are live microbes that are eaten for better gastrointestinal health. They are usually in the form of capsules or pills, and are available at most pharmacies.

Although the health benefits of probiotics have not been scientifically proven, they might help treat or prevent some gastrointestinal problems, including **irritable bowel syndrome (IBS)** and **inflammatory bowel disease (IBD)**.