All of us take immense pleasure in a spoonful of frosty yoghurt, especially on a sultry afternoon. But is it not a wonderful phenomenon by which some of our invisible friends transform liquid milk into the semi-solid food stuff—yoghurt?

The microbial world harbors some residents who are good; and will keep you happy and fit by helping in the production of healthy food items like yoghurt. The others, on the contrary, will infect you and will be ecstatic if they can keep you hospitalized for a long time. Let's take a look.

Let's take the microorganisms that have made our skin their residence. Our skin is a sense organ that spans the largest area of our body. It demands care and nourishment to give us that radiance, but very rarely can we see someone without any mark on their skin. Two very common problems that most of us are familiar with are the occurrence of acne and pimples. Acne and pimples are caused due to an oil-loving bacterium, Propionibacterium acnes, which derives its primary nutrition from the sebum (oily or waxy material that lubricates our skin) produced from the microscopic glands (the sebum glands) underneath our skin. The bacteria metabolizes the sebum to yield short-chain fatty acids along with propionic acid as metabolic byproducts and hence the name.

Another common problem with sweat is foot odour. Though many individuals blame it on over-secretion of sweat, it is actually the bacteria that thrive on the moist environment of the foot. Sialomucin is a glycoprotein secreted by the apocrine glands in the arm pits that contains proteins, fatty acids as well as a glycoprotein called glycosaminoglycan. Many bacteria like Bacillus subtilis, Corynebacterium xerosis and Staphylococcus epidermis digest Sialomucin and can also be attributed in the presence of microorganisms on the feet. Interestingly, wearing closed toe shoes can increase the intensity of the foot odor because the front portions of our feet tend to sweat more because they don't allow air to pass through, whereas cotton socks provide increased ventilation, discouraging the growth of anaerobic microorganisms.
Nothing makes us feel physically weak than a bout of cough and cold. Our nasal tract is home to very harmful organisms like Branhamella sp. and Neisseria sp. These strains that cause infection increase the extent of fluidity of our nasal mucus layer and we end up sneezing and sniffing for countless number of times! Or maybe days!

very painful sore throats. Like our eyes, our nose is also armed with its own defense mechanism. The microbes that are breathed in are trapped by the nasal epithelium and are eventually destroyed by killing agents.

What about the microbes that have made the human mouth their residence? A not so pleasant smell from inside the mouth, right after a good night’s sleep or may be bad breath at odd hours, is caused due to the presence of bacteria like Fusobacterium and Eubacterium. The mouth is conducive for microbial growth due to ample amount of moisture and due to the presence of Actinomyces viscosus. The bacterial kin will form on our tooth which occurs due to non-removal of plaque, calculus/tartar is formed on our tooth which occurs due to the presence of Actinomycyes viscosus. This bacterium is also responsible for acid secretion that destroys our enamel, leading to tooth decay.

The disastrous effects of these unpleasant microbes of our mouth can be diminished by drinking tap water and not bottled water, since the latter contain less amounts of fluorides.

The human body carries about 100 trillion microorganisms in its intestine, a figure that is ten times greater than the total count of human body cells! Bacterial species play a vital role in the digestion of food in our stomach, for example, is a bacterial species from which Pseudomonas is produced. Pseudomonas, better known in the world of antibiotics as Mupirocin, provides strong resistance to all kinds of Staphylococcal and Streptococcal colonization on the skin which may cause diseases like Impetigo and Furuncle. Mupirocin also provides resistance to open wounds and infections caused by Methicillin resistant Staphylococcus aureus (MRSA).

There are a few microbial residents in our eyes too such as Staphylococcus sp. and Haemophilus sp. The microorganisms that cause harm are Neisseria gonorrhoeae and Chlamydia trachomatis. These species are especially likely to infect a newborn’s eye because of their colonization in a female’s vaginal and cervical epithelium. These are armed with special mechanisms that allow them to attach to the epithelial layer of the eye. To fight such infections, our eyes are equipped with tear glands that secrete tears, which are rich in bacteria-killing agents like Lysozymes.

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Outside the shelter of our body, bacteria play a central role in the world of dairy goods. For instance, the extra cheese that we savor on our pizza is made by bacteria like Lactobacillus and Lactococcus. Yoghurt is another such milk variant made from bacteria.

Cheese and yoghurt are made by bacteria

A very famous bacterium residing inside our gut and carrying out all the good activities is GI Jake. It is a Bifido bacterium, which means that it is divided into two parts, and is shaped like the English Alphabet Y.

We can tell that bacteria are working in our gut, because we can sometimes smell the gas that is produced by them! The gas is a waste product of the metabolizing activities of bacteria, which when manufactured in excess amount, sometimes escapes from our body as flatulence. The gas gets really smelly if we eat too much of junk food or processed food materials, or even if we don't chew our food properly!

Bacteria even reside in huge numbers in our genitals. Lactobacillus and E. coli counts stand out in this region. We are likely to get an E. coli infection if we drink unclean water or adopt unhygienic sanitary habits. A very common disease that occurs in the female genital tract is Candidiasis caused by Candida albicans. The Candida genus of the yeast is a naturally occurring microorganism in the genital zone, whose population is controlled by the presence of Lactobacillus. Adverse conditions like antibiotic therapy, uncontrolled diabetes and poor eating habits can decrease the count of Lactobacillus leading to an overgrowth of the disease causing microorganism. So we should always make sure that we remain spick and span and maintain our ambience as well.

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Bacteria also participate in antibiotic production. Thanks to the worldwide studies that are being conducted, a variety of antibiotics have been made which resist diseases and are hence useful as drugs. Antibacterial antibiotics are those that cure diseases caused by bacteria. However, the action of antibiotics on bacteria is varied.

The most astonishing fact about antibiotics is that they are being created from bacteria and fungi, yet they are utilized and prescribed as medicines to cure bacterial, fungal and other comparable infections. Take for instance, Penicillin. Although not in vogue now, it was once recognized as the best known antibiotic to cure bacterial and fungal infections, although it is itself derived from a microorganism, Penicillium sp. Few other examples that may be cited in this regard are Amphotericin that is derived from the bacterium Streptomyces nodosus, Tetracycline derived from Streptomyces rimosus, and Streptomycin derived from a well-known bacterium, Streptomyces griseus.

Apart from bacteria, our surroundings are dotted with other microscopic organisms like Fungi and Protozoa. Some fungal species like Mushrooms are consumed worldwide although others like Amanita mushrooms are particularly poisonous. Protozoan species have assorted effects as well. Some forms like Trypanosoma gambiense and Entamoeba histolytica are very destructive. But other forms lend a helping hand in wastewater treatment processes, in enhancing the soil fertility and also in controlling the pollution of ecosystems.

So we have to accept our Nature as it is, though it is important to make sure that we don't underestimate the power of a microorganism, be it in a benign fashion or in an unfriendly sense!

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