

*Commentary*

## Microbes in our everyday lives

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### INTRODUCTION

Microbial communities make oxygen, carbon, nitrogen, and sculpture available to other forms of life on our planet. Other types of life on our planet can access oxygen, carbon, nitrogen, and sculpture thanks to microbial communities. If microbial decomposer communities did not exist, life would be suffocated by dead organisms. Microorganisms also perform more than half of the photosynthesis on our planet, increasing oxygen levels and decreasing carbon dioxide levels. Microbial communities that boost nutritional availability, provide disease protection, create vital vitamins, or the entire above are intimately linked to animals and plants. Every human cell has 10 bacteria that help with digestion, vitamin K production, immune system development, and the detoxification of hazardous substances. Many of our favorite foods, such as bread, cheese, and wine, rely on microbes for their production.

We gain from microorganisms in a variety of ways. Commercial, medicinal, agricultural, and environmental purposes are the four categories in which they are used.

The following are some of the commercial applications of microorganisms.

**Curd and cheese production:** Do you have any idea how to make curd at home? Typically, a tablespoon of curd is mixed into warm milk overnight, resulting in curd. This occurs when casein, a protein found in milk, coagulates and forms curd. *Lactobacillus*, a bacterium found in a teaspoon of curd added to milk, transforms the lactose sugar in the milk to lactic acid. This produces the acidic environment that casein coagulation requires. Fermentation is the process of microorganisms converting a sugar into an acid or an alcohol.

**Making alcoholic beverages:** Alcoholic beverages, such as beer and wine, are made by a microscopic fungus called yeast

fermenting sugar found in barley and grapes, among other things. Alcohol and carbon dioxide are produced during yeast fermentation.

**Making bread:** Making bread entails kneading dough made up of flour, salt, sugar, yeast cells, and water. Yeast converts sugar to alcohol and carbon dioxide. The volume of the dough increases as more carbon dioxide is created. The yeast is killed and the fermentation is stopped by baking the expanded dough at 180°C. The alcohol evaporates throughout the baking process.

Producing vinegar (acetic acid), coffee, and tobacco: Bacteria are employed to make vinegar (acetic acid), coffee, and tobacco.

**Making toothpaste:** Diatom shells are added to give toothpaste a rough texture that aids in tooth cleaning. The bacteria *Xanthomonas campestris* produces xanthium gum, which is used to make toothpaste.

### Microorganisms for medical purposes

The following are some of the medical uses of microbes.

**Antibiotic production:** Antibiotics, which are medicines that kill disease-causing bacteria and fungi, are made from particular bacteria and fungi. Antibiotics include penicillin (derived from the fungus *Penicillium*), streptomycin, and tetracycline (both derived from *Streptomyces* bacterium). Antibiotics are also used to treat bacterial infections in both animals and plants.

**Vaccine production:** When a disease-causing microorganism enters our bodies, our bodies create antibodies. These antibodies fight and destroy the pathogen, then remain in the

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body to fight future infections from the same microorganism. A vaccination is a preparation of disease-causing microorganisms that have been killed or weakened. These antibodies stay in our bodies and protect us from infection by the same organism in the future (s). Vaccines thus aid in the prevention of diseases caused by microbes (e.g. polio, cholera, typhoid, smallpox, and hepatitis). Creating food supplements: Microbes rich in proteins and other nutrients, such as Chlorella (a form of algae), are utilized as food supplements.

**In the human body:** Lactobacillus acidophilus bacteria dwell with the intestines, where they aid in digestion and kill disease-causing microorganisms.

Bacteria and fungus operate on the remains of dead plants and animals, converting them to simple compounds. The action of bacteria in removing dead bodies keeps our planet clean. Bacteria are also used in the treatment of waste organic matter in sewage systems.