



Harnessing the Importance and Benefits of Microorganisms to Improve Livelihood

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Microbiology has been the most experimentally-based biological sciences. It will also be a major element in the coming biological era of technology and science and might well play a major role in “sustainable development”. This field of life science that studies microscopic organisms and their interconnectedness with other living organisms is a vast course with various aspects bordering on food, environment, health, agriculture and everything in-between. Indeed, microorganisms (bacteria) are one of the first life forms to appear on earth and they make it possible for all other life on earth to exist.

For centuries, garri has been a major staple food consumed across some African countries including Nigeria, Ghana, Benin Republic and Liberia. It is prepared and taken in different forms and doubles as a good source of energy and nutrients for the body. It would not therefore be hyperbolic to state that without certain microorganisms, including some species of bacteria like *Corynebacterium manihot*, *Leuconostoc mesenteroides* and *Lactobacillus plantarum* that are involved in the submerged fermentation of cassava during which cyanogenic toxic substances and malodorous aroma are removed, the widely consumed staple may not have been so desirable. Apart from garri, microorganisms have been extensively used to produce foods like fermented milk (nunu), cheese (wàrà), bread, ògi, palmwine, burukutu and masa while increasing their shelf life and nutritional quality. By way of verse, probiotic foods including yoghurts and fermented soybeans are incredibly healthy and may improve digestive health, reduce depression, and promote heart health. Taking probiotics, whether from food or supplements, can have powerful effects on health which makes the SDG3 of Good Health and Well-being highly achievable, and the SDG2 of Zero Hunger possible if these foods are readily made available for

need-based people and hunger is being tackled defiantly by national economies, Nigeria's in this case.

The high rate at which environmental pollution continues to deprive us of a safe and healthy environment is appalling. Although most of these pollutions are caused by human action, microorganisms can help a great deal in doling out environmental sanitation measures including oil spillage cleaning, air purification, and waste decomposition. The WUPA wastewater treatment plant in Abuja is taking appropriate steps to properly manage and purify wastewater before discharging it into water bodies, the action of microorganisms on wastes to detoxify them before release into the environment is one that humans can never undermine. Microorganisms help purify the air and ensure the continuous cycling of nutrients in the biogeochemical cycle, these nutrients include elements like nitrogen, carbon and oxygen without which other living things cannot survive.

Needless to say, microbiology is currently helping the world fight the deadly SARs-CoV virus that has caused the COVID-19 global pandemic and we hope to find a cure soon and bring an abrupt end to the pandemic. Without microbiology, doctors would not be able to have accurate diagnosis of diseases because diagnosis cannot take place without uncovering the pathology/pathogenicity of harmful microorganisms. Furthermore, microbes are used to make new therapies which help us to fight infections and illnesses. These therapies include vaccines and antibiotics, which when produced continuously can help us ward off diseases and treat infections respectively. Microorganisms can also be used for the commercial and industrial production of enzyme, organic acids and alcohols which is used widely in food industries.

Microbes act as bio-fertilizers (organisms that enrich the nutrient quality of the soil) and are indispensable when it comes to creating soils that support crops and livestock. Judicious use of these bio-fertilizers in cultivating plants that would give highly palatable yields, would not only improve the quality of foods being harvested and consumed, it would also afford farmers to rear well-fed and healthy livestock that would produce quality stock products thereby generating income revenue for the farmer and the entire nation at large.

Microbiologists can make a difference in our lives by ensuring that our food is safe, tracking the role of microorganisms in climate change, treating and preventing disease, and applying biotechnology to crop planting and other farm practices. Nigeria needs to give us a chance at improving the lives of our fellow countrymen by harnessing the benefits of microorganisms to improve lives and overall livelihood. This is highly achievable and would be sustainable.

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