**Misunderstood bacteria**

**Reading comprehension**

**Introduction**

Bacteria are usually associated with dirt, disease, and death.

Bacteria suffer from negative public relations. You probably associate bacteria with the three D’s: dirt, disease and death. And indeed, for centuries bacterial infections were the major cause of infant and child mortality worldwide.

Child mortality began to decline after people were educated about better hygiene. The decline continued with the introduction of antibiotics for better treatment and vaccination for prevention of common deadly diseases.

Bacteria are certainly involved in dirt, disease and death, to which we should add decay (descomposición). Spoilage(desperdicio) of leftover food (sobras), decomposition of garden cuttings, decay of dead bodies, or smelly water in a forgotten vase, are all the result of bacterial activity. As is body odor(hedor), caries, strep throat (infección de garganta), or bubonic plague, to name a few diseases from both ends of the spectrum. No wonder that bacteria receive a bad press.

Bacteria that caused large-scale disease in our history may be close to extinction.

Commercials want us to believe that the only good bacterium is a dead bacterium. Antimicrobial agents are added to tooth paste, soaps, detergents, and plastics. There is no Society for the Protection of Bacteria, although there is a satirical initiative for the Ethical Treatment of Bacteria.1 Some bacteria may even hover on the edge of extinction, and it is no coincidence that these are pathogenic (disease-causing) bacteria such as *Salmonella typhi* (the cause of typhoid fever) or *Yersinia pestis* (the cause of plague).

Another common misconception is that all bacteria are bad for you. Some bacteria you’d better not meet, but the majority of them are completely harmless (inofensivas), and some are highly beneficial to us. Confusingly, certain bacteria can be beneficial to some animals, and pathogenic to others. More commonly, pathogenic bacteria are harmful (perjudiciales) only to a limited number of hosts, or even only to one, whereas they live happily within other hosts without causing trouble. If the suffering host happens to be human, the culprit (culpable) bacteria are called human pathogens; however, from the bacterial point of view, humans are just the wrong host to be in. So who is to blame (culpar) for the disease?

**Most bacteria are completely harmless. We couldn’t live without bacteria**

The human body is home to millions of beneficial bacteria.

We house millions of bacteria on our skin and in our nose, mouth, and gut:

* up to 500 species can be found as normal oral flora5
* there can easily be 25 species living in a single mouth
* a milliliter of saliva can contain as many as 40 million (4 x 107) bacterial cells6
* 108 bacterial cells present in the cecum (the initial part of the colon) per milliliter of content is normal and many of these species are different from those found in the mouth7

Antibiotics can wipe out our body’s beneficial bacteria, causing unwanted health consequences.

Strictly speaking, the inside of our mouth, stomach and intestines are part of our outer surfaces. Although they are inside our body, their surfaces are in direct contact with the outside world, and as food particles pass the mucosal inner lining of our intestines, hitchhiking bacteria can stay there and multiply. We are born sterile (free of bacteria) but within hours we are colonized by our little friends, not to be left alone again.

Without bacteria we would not survive. They help us digest our food, produce vitamins, and occupy niches that would otherwise be available for competing pathogens. This competitive effect becomes apparent when we wipe out a large proportion of our intestinal flora, for instance by an antibiotic that is prescribed to treat a bacterial infection. Diarrhea is frequently the unwanted result, as ‘foreign’ bacteria take their chance to occupy the ‘empty’ niches. Healthy bacteria take over in time, so that in most cases the side effects of antibiotics are soon gone. Bacterial populations grow into a state of equilibrium until some external factor disturbs it again.

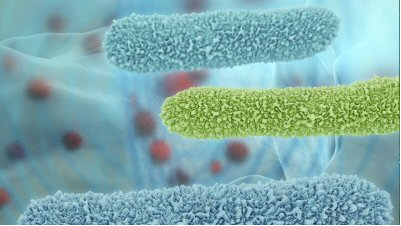
**Certain bacteria are good for you**

For centuries, people have eaten certain food deliberately for the bacteria it contains and have used bacteria in food preparation.

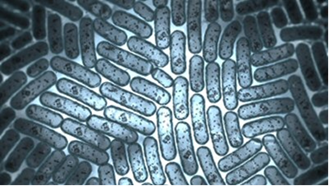
Certain foods and the way we process food depend on bacteria.

We can buy supplements or foods with beneficial bacteria.

* The best-known example is the consumption of yogurt and other fermented milk products, which have the combined effect of reducing spoilage, and enhancing tolerance for partially lactose-intolerant individuals.
* A major industry has developed to produce bacterial preparations, in the form of powders, drinks, and dairy products; all sold as healthy and beneficial (and sometimes tasty) supplements. Although some of their promises are unrealistic (some products don’t even contain viable bacteria), it is generally accepted that certain bacteria are beneficial, especially when intestinal flora is unbalanced (as with antibiotic-associated diarrhea). The most commonly used bacterial species as so-called probiotics are *lactobacilli* and *bifidobacterium*.8
* A number of bacterial species are required for the preparation of food, and may or may not arrive on our plate alive.9 Notably, many cheese varieties are dependent on their characteristic bacterial starter culture. Fermenting bacteria are required to produce sausages and sauerkraut; they even help cacao and coffee beans to attain their desired flavor.10



**Different examples of bacteria**



**Earth: the planet of bacteria**

In a gram of soil, approximately 108 bacteria are present11 and these are estimated to represent over 10,000 species. Interestingly, there are more than 1030 bacteria on earth, compared with fewer than 1010 humans.12

Conclusion: Bacteria are essential to human health and the world’s ecosystems.

* Bacteria were the first living organisms found on Earth.
* They inhabit deserts, ice caps, oceans and hot springs.
* The number of bacterial species worldwide is estimated to be more than a thousand million.11 Their individual sizes may be insignificant, but their number and diversity is unimaginably large.
* Bacteria contribute substantially to the total biomass in marine environments.13 And, since oceans cover 70% of our planet’s surface, bacteria make up a significant part of the total biomass on Earth.

These facts are truly impressive for organisms so small that they are invisible to the eye. It is to our advantage to look at bacteria as more than just pathogens.

**Bacteria are awesome!!!**

**Questionnaire**

**Answer this questions about the reading of bacteria:**

1.-What two facts do decline illnesses mortality related to bacteria?

*¿Qué dos hechos reducen la mortalidad en las enfermedades causadas por bacterias?*

2.-What kind of activities are involved bacteria?

*¿Qué actividades realizan las bacterias?*

3.-What commercials want us to belive? Explain why.

*¿Qué nos quieren hacer creer los comerciantes? Explica por qué.*

4.-Are all bacteria harmfull?

*¿Todas las bacterias son peligrosas para la salud?*

5.-Name three places in the human body where bacteria can live.

*Nombra tres sitios en el cuerpo humano donde las bacterias puedan vivir.*

6.-What happen when we wipe out bacteria with antibiotics?

*¿Qué pasa cuando matamos las bacterias con antibióticos?*

7.-Think about different foods that may contain bacteria.

*Piensa diferentes alimentos que puedan contener bacterias.*

8.-Write down some conclusions about the awesome bacteria world.

Escribe algunas conclusiones acerca del increíble mundo de las bacterias.

