

How clean is your floor?

Since the beginning of the pandemic, some of us have gained a better understanding of the germs and bacteria that surround us. But where exactly are these germs hiding? We swabbed homes and surveyed members of the public to find out what germs are lingering on our surfaces and floors. We also teamed up with microbiologist Dr. Jonathan Hughes to learn more about how to tackle bacteria around your home, once and for all.

What germs are we looking at?

There are all sorts of unwelcome pathogens that can hang around on various surfaces in your home, from your floor or sink to your television remote. They can infiltrate and infest your home through cross-contamination from unwashed vegetables and raw meat, and by less-than-stellar hygiene practices.

The pathogens we looked at in this experiment include *Escherichia Coli* (*E. coli*), Faecal streptococci (FS) and *Salmonella*, which are commonly found in the intestines of animals and humans. FS is found in the intestines of humans and animals, so when traces of this are found, it is a strong indicator that hands are not being washed (properly, if at all) after a trip to the bathroom. Various other pathogens such as *Pseudomonas aeruginosa* (*P. aeruginosa*) and *Bacillus cereus* (*B. Cereus*) originate in soil and water vegetation – meaning they grow very well in moist conditions.

So what damage can these little nasties cause? Well, *P. aeruginosa* can cause disease in plants, animals and humans. As *P. aeruginosa* can infect any part of your body, symptoms can depend on where the infection is, and may include redness of skin and wounds. But don't worry, a very high concentration of bacteria is usually needed to cause an infection, and by ensuring you wash your fruits and vegetables properly before eating them, you should be okay. FS, on the other hand, can cause vomiting, diarrhoea and nausea, so make sure to wash your hands properly after using the bathroom and regularly change the towels you dry your hands with.

The germiest place in the home

We put the homes of our volunteers under the microscope and discovered that even though sponges have the highest concentration of pathogens, when it comes to surfaces around the house, it's the floor that claims the title for the highest

Meet the pathogens



Salmonella

Lives in the gut of many farm animals. Symptoms include diarrhoea, fever and cramps. Found on raw meats and unwashed vegetables.



Escherichia coli

Lives in the intestines of livestock and can be passed into meat and milk. It causes serious food poisoning with symptoms of diarrhoea, vomiting and urinary tract infections.



Clostridium perfringens

Found in the intestinal tract of humans, decaying vegetation and raw meat and poultry. Spores can survive in most conditions, including high temperatures. Symptoms include cramping, vomiting and diarrhoea.



Staphylococcus aureus

Found on the human skin, in the nose, armpit and groin area. Does not always cause harm but can be dangerous in some circumstances. Symptoms include food poisoning, skin and respiratory infections.



Bacillus cereus

Found in soil and vegetation. Causes food poisoning when food is improperly cooked. Can cause severe nausea, vomiting and diarrhoea.



Faecal streptococci

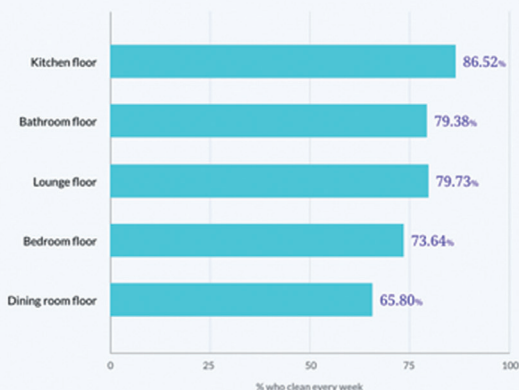
Found in the intestines of humans and animals. Both are strong indicators of faecal matter contamination. Symptoms can cause vomiting, diarrhoea and nausea.



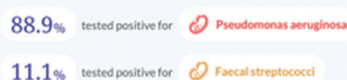
Pseudomonas aeruginosa

An opportunistic pathogen found in soil, water and plants. Can cause disease in plants, animals and humans. Symptoms include redness of the skin, abscesses and wounds.

How often do we clean certain floors?



The most common bacteria on our floor



bacterial count. Our results found that 100% of the floors we swabbed tested positive for *P. aeruginosa* and 10% tested positive for FS.

This is unsurprising when you think about it. Whatever you, your guests or your furry friends step in when you're out in the great outdoors, you then traipse into your home on the soles of your shoes. This could be why 55% of Brits make people take their shoes off before they walk into their homes. Our survey revealed that parents are sticklers when it comes to shoes in the house, with nearly 60% of them asking for guests to remove shoes. It's a crucial step to help keep kids, pets and the whole family safe.

How often do we clean our floors?

Now we know how our floors have claimed a medal for being the germiest surface in the house, this could explain why a respective 87%, 80% and 79% of people clean their kitchen, lounge and bathroom floors every week. Some say that cleanliness is next to godliness, but does the type of floor we have in our homes encourage us to clean more? Well, the answer is yes. Quite significantly. Nearly 16% of Brits feel the need to vacuum the carpet every day, which is twice as often as hardwood floor owners. After carpets, 12% of laminate floor owners and 10% of tile floor owners also feel the need for a daily clean.

The 5-second rule

We've all been there. You go to pop a crisp, a piece of chocolate or any other delicious thing in your mouth and it jumps out of your hand and lands on the floor. You employ the trusty 5-second rule, inspect it for visible debris and pop it in your mouth. Job done. So, to assess the safety of this practice, we did some digging to find out the science behind the urban-myth of the 5-second rule and if it is safe to be eating food off of the floor, even if it was only there for a few moments.

A study conducted by Aston University found that time is a significant factor in the transfer of bacteria from floor to your dropped morsel, but so is the type of flooring. Carpet is less likely to transfer bacteria than less porous surfaces like laminate and tile. So, if you practice the 5-second rule, you may want to invest in a good steam cleaner and use it frequently to make sure your floor is cleaned properly.

They also surveyed 2,000 people to find out who is most likely to be guilty of putting the 5-second rule into practice. A massive 87% of Brits stated they would eat food off the floor or have already done. Where they put this into practice varies significantly, 56% of respondents think it's acceptable to eat off their own floor, but only 17% would eat it if they dropped it at someone else's house.

Methodology

We conducted an experiment with eight volunteers, that involved us testing eight areas of their kitchens to see where the most bacteria live. The bacteria that we tested for are *Escherichia coli*, *Clostridium perfringens*, *Pseudomonas aeruginosa*, *Salmonella*, Faecal streptococci, *Staphylococcus aureus*, *Bacillus cereus*. The survey was conducted by Censuswide and gathered data from 2,003 UK adults.

Sources

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What the expert says...



Allow us to introduce Dr. Jonathan Hughes. Trained in the field of molecular biology, genetics, microbiology, plant physiology and conservation science, Dr. Hughes currently supports the teaching of these fields to undergraduate and masters students – including working with, and the appropriate handling of, category 2 microorganisms.

These are commonly associated with food poisoning in the home, and include *Bacillus cereus*, *E. coli* and *Listeria monocytogenes*.

How do these germs end up on our floors?

Bacteria such as *P.aeruginosa* and Faecal streptococci end up on the floors of our homes mainly from the soles of our shoes and paws of our pets. *P.aeruginosa* is a bacterium commonly found in soil and water, so it is easy to transfer via footfall.

Bacteria can also be transferred to the floor when objects carrying bacterial populations come into contact with it. For example, when raw food is dropped or droplets of water contaminated with bacteria, such as splashback from cleaning plates or raw food, fall to the floor.

What other germs can we expect to find on our floors?

You can expect to find hundreds of species of bacteria on your floors. This includes bacteria from groups such as *pseudomonas*, *staphylococci*, *streptococci*, *bacilli*, *coliforms* and *enterococci*.

How often should we be cleaning our floors?

Ideally, you should clean your floors once a week to ensure good hygiene and keep bacterial populations under control. In the event something happens that is likely to contaminate the floor, such as dropping raw foods or if a pet has an accident, then you should clean and disinfect the area immediately.

What would you say to people who practice the 5-second rule?

Once the food comes into contact with the floor, bacteria start to transfer instantly. The rate at which they are transferred depends on the nature of the food and the nature of the floor surface. If the food is wet or sticky, it's easier for bacteria to get onto it, using the fluid as a medium to travel through. It's also easier for food to be transferred from a smooth surface such as tiles or lino than a rough surface such as carpet.

The potential risk from "rescuing" fallen food is very low for most of the population. If you're in good health with no conditions weakening your immune system and the floor is cleaned frequently, you'll probably get away with it. Just ask yourself if that chocolate digestive that escaped your grasp will be worth it if you're unlucky! If you are at all concerned, err on the side of caution and don't eat it.

How do you think Covid-19 has changed our cleaning habits?

I think that Covid-19 has definitely had an impact on our cleaning habits. Before the pandemic, we were, in general, far less concerned and aware of the microscopic and submicroscopic components in our environment. Often the worst thing people have had to be concerned with regards to hygiene in the home has been food poisoning.