

Can the new type of coronavirus be transmitted via food and objects?

Updated BfR FAQ dated 29 June 2020

After the outbreak of the respiratory tract disorder COVID-19 caused by an infection with the new type of coronavirus (SARS-CoV-2), and the subsequent epidemic in various regions of China, the virus is now around the world. Disconcerted consumers have asked the German Federal Institute for Risk Assessment (BfR) whether the virus can also be transmitted to humans via food and imported products, such as children's toys, mobile telephones, objects such as door handles, tools, etc., as well as dishes and cutlery. Against this background, the BfR has summarised the most important questions and answers on the topic.

What do we know so far about the new type of virus-related respiratory tract disorder?

The new type of respiratory tract disorder COVID-19 is based on an infection with the new type of coronavirus (SARS-CoV-2). Knowledge about the exact transmission methods of this coronavirus are still limited. However, the transmission methods of other closely related coronaviruses are well known. Different types of coronavirus typically trigger conventional colds in humans. Moreover, other coronaviruses, such as the SARS and MERS coronaviruses, have occurred in the past and have led to severe respiratory tract disorders. The main target organs of coronaviruses in humans are the respiratory tract organs.

The most important transmission pathway of SARS-CoV-2 is considered to be a so-called "droplet infection", in which the viruses are released into the air by infected people via droplets - for example, when sneezing or coughing - and then inhaled. In certain situations, aerosol transmission (droplet nuclei, smaller than five micrometers) - for example, when speaking - also seems possible. Furthermore, transmission via contact or smear infections cannot be ruled out. In those cases, viruses located on the hands enter the mucus membranes of the nose or eyes, where they may lead to an infection.

Further information on these transmission pathways (in German) can be found at the Robert Koch Institute (RKI) at

- https://www.rki.de/DE/Content/InfAZ/N/Neuartiges_Coronavirus/Steckbrief.html

(here: 1. Übertragungswege)

The RKI is in close contact with the World Health Organisation (WHO) and monitors all up-to-date news about the event.

- <https://www.rki.de> and
- https://www.rki.de/SharedDocs/FAQ/NCOV2019/FAQ_Liste.html

In specific cases, orders are issued by the local health authorities, which can be contacted for further information:

<https://tools.rki.de/PLZTool/>

Can you become infected with coronaviruses via food or objects?

There are currently no cases which have shown evidence of humans being infected with the new type of coronavirus via the consumption of contaminated food. There is also currently no reliable evidence of transmission of the virus via contact with contaminated objects or contaminated surfaces, which would have led to subsequent human infections. However, transmission

through smear infections via surfaces that shortly before have been contaminated with viruses cannot be ruled out.

Can coronaviruses survive and remain infectious on solid and dry surfaces, outside human or animal organisms?

The stability of coronaviruses in the environment depends on several factors, such as temperature, air humidity and surface conditions, as well as the specific virus strains and the virus quantity. In general, human coronaviruses are not particularly stable on dry surfaces. Inactivation in dry conditions generally occurs within a period from a few hours to a couple of days. Initial laboratory tests by an American working group for the new type of coronavirus SARS-CoV-2 show that it can remain infectious for up to 3 hours as an aerosol, up to 4 hours on copper surfaces, up to 24 hours on cardboard and up to 2-3 days on stainless steel and plastic following heavy contamination.

- https://www.nejm.org/doi/full/10.1056/NEJMc2004973?url_ver=Z39.88-2003&rfr_id=ori%3Arid%3Acrossref.org&rfr_dat=cr_pub%3Dpubmed.

According to this laboratory-confirmed stability data, the coronavirus SARS-CoV-2 has to be considered markedly less stable than many other pathogens, e.g. various non-enveloped viruses or bacterial spores. The stability mentioned in the study was determined in a laboratory under optimum conditions and with high concentrations of the virus. In practice, it is expected that due to additional factors, such as daylight, fluctuations in temperature and humidity, and lower contamination levels, the stability is lower than in the laboratory study.

Can imported goods from regions where the disease has spread be sources of an infection in humans?

Due to the transmission methods recorded thus far, and the relatively low environmental stability of coronaviruses, it is unlikely that imported goods such as foods, cosmetics or consumer goods and toys, tools, computers, clothes or shoes may be sources of an infection with the new type of coronavirus, according to the current state of knowledge.

Can dock workers, haulage company workers handling containers, or workers who deal with the further processing of imported semi-finished products, components or other prefabricated products, be infected by the new type of pathogen?

Due to the low environmental stability of coronaviruses, a transmission of the pathogen via this method seems unlikely in most cases. The German Federal Institute for Occupational Safety and Health and the Committee for Biological Agents, are responsible for assessing possible risks concerning infectious agents at the workplace.

- <https://www.baua.de/DE/Angebote/Aktuelles/Meldungen/2020/2020-01-30-Coronavirus.html>

How can we protect ourselves from being infected by the virus via food and products (including cosmetics)?

Although it is unlikely that the virus will be transmitted via contaminated food or imported products, general everyday hygiene rules, such as regular hand washing, and hygiene rules for food preparation (<https://www.bfr.bund.de/cm/364/protection-against-foodborne-infections.pdf>) should be observed when handling them. Coronaviruses cannot multiply in food as they need a living animal or human host to do this. As the viruses are sensitive to heat, the risk of infection can also be further reduced by heating foods.

Cosmetic products, such as lipsticks or make-up, should not be shared or used by multiple people and creams from opened pots should only be removed with thoroughly washed hands or a clean spatula.

Can the new type of coronavirus SARS-CoV-2 be transmitted via dishes and cutlery in canteens and other places people eat together?

Coronaviruses can generally reach cutlery or dishes through an infected person sneezing or coughing directly on them and they can survive on these solid surfaces for some time. A smear infection then appears to be possible if the virus is transmitted via cutlery or the hands to the mucous membranes of the nose, eyes, mouth or throat. However, the BfR is not yet aware of any infections with SARS-CoV-2 via this transmission method.

Is the virus rendered inactive by washing up by hand or using the dishwasher?

As enveloped viruses, the genetic material of which is coated by a layer of fat (lipid layer), coronaviruses react sensitively to substances that dissolve fat, such as alcohols or surface-active agents, which are contained in soaps and dishwashing detergents as grease removers. Although specific data is not yet available for SARS-CoV-2, it is likely that these substances damage the virus surface and render the virus inactive. This applies in particular if dishes are washed and dried in a dishwasher at 60 degrees Celsius or higher.

Can coronaviruses survive on textiles?

Currently, the BfR has no information on the survival time of the SARS-CoV-2 virus on textiles or in the washing machine. As enveloped viruses, the genetic material of which is coated by a layer of fat (lipid layer), coronaviruses generally react sensitively to substances that dissolve fat, such as surface-active agents, which are contained in detergents as grease removers. In everyday life, people in private households can wash their laundry as usual.

Clothes, bedding, underwear, towels, flannels, etc. of ill persons as well as textiles that have come into contact with infectious bodily fluids should be washed in the washing machine at a temperature of at least 60°C with a heavy-duty detergent and dried thoroughly. When handling laundry of ill persons, direct contact of skin and clothing with contaminated materials should be avoided, the laundry should not be shaken and hands should be washed thoroughly afterwards. You will find more information from the Robert Koch Institute (RKI) at

- https://www.rki.de/DE/Content/InfAZ/N/Neuartiges_Coronavirus/ambulant.html

and the Federal Centre for Health Education at

- <https://www.infektionsschutz.de/hygienetipps/haushaltshygiene.html>

Can self-made masks (“community masks”) made of textiles prevent the transmission of coronaviruses?

The Robert Koch Institute (RKI) explains when it makes sense to wear a mouth and nose protection in public against the new coronavirus:

- https://www.rki.de/SharedDocs/FAQ/NCOV2019/FAQ_Liste.html

The German Federal Institute for Drugs and Medical Devices (BfArM) provides information (in German) on the various medical protective and performance features of different mask types (“community masks”, mouth-nose-protection, filtrating half masks):

- <https://www.bfarm.de/SharedDocs/Risikoinformationen/Medizinprodukte/DE/schutzmasken.html>

You will also find rules here for people who wear a “community mask” as well as instructions for cleaning the masks.

Furthermore, the use of sewn-in shaping materials (plastic, metal) and the manufacturer’s instructions for the textiles used must be observed when cleaning the “community mask”. Textiles can contain a variety of chemical substances. They give the textiles the desired properties, such as colour, shape, adhesion, or water repellent properties. Residues of these chemicals can sometimes remain on the textiles after the production process and later be released during wearing. New textiles should, therefore, be washed first before wearing, especially if they come into contact with the mouth and nose as part of a home-made community mask.

At the moment, masks with nano-silver are offered in shops and on the Internet. Little is known about the effect of nano-silver on viruses. For corona viruses, there are a few studies which show a moderate inactivating effect, but this also depends on the type of nanoparticles and their application. For SARS-CoV-2, a study was recently published describing an inactivating effect of a silver nanocluster solution applied to a respiratory mask.

➤ <https://www.sciencedirect.com/science/article/pii/S2666539520300067?via%3Dihub>

There may be differences between the various different forms of silver with regard to absorption into the organism, distribution and possible effects on cells and tissue. Therefore, findings on the health risks of a certain form of silver cannot be directly transferred to other forms. When wearing community masks, it should be remembered that silver ions can also be released by respiratory condensate or saliva. Due to the lack of studies and data, a final assessment of the health risks of silver-coated temporary masks is currently not possible. Furthermore, the longer-term risks of such products, such as the effects on the microflora of the skin and a possible development of resistance in bacteria, have not yet been sufficiently researched.

The BfR therefore recommends, as already described in Statement 024/2010 (https://www.bfr.bund.de/cm/343/bfr_raet_von_nanosilber_in_lebensmitteln_und_produkten_des_taeeglichen_bedarfs_ab.pdf), that the use of nanoscale silver and nanoscale silver compounds in food and consumer-related products should be avoided until the data situation permits a final assessment of the health risks associated with consumer exposure and until significant open questions regarding the spread of resistance have been clarified.

Can coronaviruses be transmitted by touching surfaces such as cash, card terminals, door handles, smartphones, shopping trolley handles, packaging or bags?

The BfR is not aware of any infections with SARS-CoV-2 via this transmission path. Coronaviruses can generally reach surfaces through an infected person sneezing or coughing directly on them and they can survive there for some time. A smear infection to another person appears to be possible if the virus is transmitted shortly afterwards via the hands to the mucous membranes of the nose, eyes, mouth or throat. For protection against virus transmission via contaminated surfaces, it is important to comply with the general hygiene rules, such as washing hands regularly and keeping hands away from the face.

Can coronaviruses be transmitted via bakery goods or fresh fruit and vegetables?

The BfR is not yet aware of any infections with SARS-CoV-2 via this transmission path. Coronaviruses can generally reach bakery products or fruit and vegetables through an infected person sneezing or coughing directly on them. They cannot multiply in food, as they need a living

animal or human host to do this. A smear infection to another person then appears to be possible if the virus is transmitted shortly afterwards via the hands or the food itself to the mucous membranes of the nose, eyes, mouth or throat.

To protect yourself from virus transmission, it is crucially important to observe the general rules of everyday hygiene such as washing your hands regularly and keeping your hands away from your face. Bakery products in retail stores are usually protected from sneezing and coughing by customers by splash guards at the counter or self-service counters; these minimise the risk of contamination. When preparing fruit and vegetables, the general rules of hygiene should be observed, which include thorough washing of the food and frequent hand washing during the handling.

- https://www.baua.de/DE/Themen/Arbeitsgestaltung-im-Betrieb/Biostoffe/FAQ/FAQ-2_node.html

Can coronaviruses be transmitted via meat products?

Contamination of meat or meat products with coronaviruses could happen during slaughter or during meat cutting and processing. However, the BfR is not yet aware of any SARS-CoV-2 infections via consumption of meat products or contact with contaminated meat products. According to the current state of knowledge, farm animals used for meat production cannot be infected with SARS-CoV-2 and, therefore, cannot transmit the virus to humans via this pathway.

Coronaviruses can generally be transmitted from an infected person to sausage and meat if hygiene rules are ignored, for example, via contaminated hands or by direct sneezing or coughing. However, the hygiene rules and protective measures that usually must be observed in abattoirs and meat cutting facilities generally minimise the risk of contamination with pathogens, which also applies to SARS-CoV-2. Meat and meat products in retail stores are usually protected from sneezing and coughing by customers by splash guards at the counter; these minimise the risk of contamination. A smear infection of another person only appears possible if this food is touched shortly after contamination and the virus is then transmitted via the hands to the mucous membranes of the nose, eyes or mouth. Coronaviruses cannot multiply in food as they need a living animal or human host to do this. However, transmission through smear infection would only be possible during a short period after contamination due to the relatively low stability of coronaviruses in the environment. According to the current state of knowledge, the oral/alimentary transmission pathway by consuming meat products does not play a role in the current outbreak of SARS-CoV-2.

To protect yourself from virus transmission, it is crucially important to observe the general rules of everyday hygiene such as washing your hands regularly and keeping your hands away from your face also when preparing food. Furthermore, meat and poultry in general should be heated sufficiently and evenly before consumption - also to protect against other possible pathogens - until the meat juice trickling out is clear and the meat has turned to a whitish colour (poultry), a greyish-pink colour (pork) or a grey-brown colour (beef). You can find more information on hygiene when handling food at:

- <https://www.bfr.bund.de/cm/364/protection-against-foodborne-infections.pdf>

Can coronaviruses be transmitted via milk from cows fed on possibly contaminated feed?

Transmission of SARS-CoV-2 via milk, as for other foods, is unlikely on the basis of current knowledge. The BfR is not aware of any infections with SARS-CoV-2 via this transmission method. The Friedrich Loeffler Institute and the Robert Koch Institute are not yet aware of any

information from China or other countries affected by SARS-CoV-2 that indicate a particular role for feed for pets and livestock.

So far, there is no evidence that animal feed is a vehicle for coronaviruses.

Can coronaviruses be transmitted via feed for pets or livestock?

The BfR is not yet aware of any information from China or other countries affected by SARS-CoV-2 that indicate a particular role for feed for pets and livestock. So far, there is no evidence that animal feed is a vehicle for coronaviruses.

This applies both to the feeding of livestock and to the feeding of pets. For feeding livestock, staple feed (grass, hay, ensiled vegetable feed) and compound feed is used. Compound feed is described as mixtures of different feeds (e.g. made up of cereals, soya meal and possibly additives). This also includes supplementary feeds including mineral feeds, which are additionally fed to ensure the animals' energy and nutrient requirements.

For feeding of pets, ready-made feed is mostly used. This is understood as dry food (e.g. pellets, biscuits), wet or moist food, frozen food, grain food or even snacks (e.g. dog biscuits, dog cookies, chews).

The Friedrich-Loeffler-Institute (FLI), Federal Research Centre for Animal Health, provides information on the role of farm animals and pets in events concerning coronavirus. (<https://www.fli.de/de/aktuelles/tierseuchengeschehen/coronavirus/>) There is no evidence so far that livestock can be infected with SARS-CoV-2. Furthermore, there is currently no scientifically verifiable evidence of epidemiologically relevant infection of pets by infected persons.

Can e-cigarette users become infected with the coronavirus if they share the tip with other people?

Coronaviruses can be transferred to the tip when an infected person uses an e-cigarette and can survive there for some time. Contact infection of another person is possible if the virus passes directly to the mucous membranes of the oral cavity. To minimise this risk, e-cigarettes should not be shared with others. This also applies to standard cigarettes, cigars and pipes.

Is there proof that taking high doses of vitamin D via food supplements can prevent an infection with SARS-CoV-2?

It has been suggested on the internet that taking food supplements containing (sometimes very high doses of) vitamin D can provide protection against an infection with the SARS-CoV-2 coronavirus and/or the triggering of the disease COVID-19. We have only been aware of SARS-CoV-2 for a short time. The BfR is not aware of any studies that prove that taking vitamin D compounds protects against infection with this virus or against triggering the disease.

Food supplements have not been confirmed to heal or alleviate diseases. Food supplements are not pharmaceutical products, but foods that can supplement normal nutrition. They must be safe and must not have side effects.

Naturally, a sufficient supply of vitamin D is important for health. It is also scientifically recognised that vitamin D contributes to the normal functioning of the immune system. However, this does not mean that people should, therefore, take high doses of vitamin D compounds. Case studies have indicated that taking very high amounts of vitamin D compounds of one's own volition, without medical supervision, can carry health risks.

➤ <https://www.akdae.de/Arzneimittelsicherheit/DSM/Archiv/2017-42.html>

If a supplement with vitamin D is desired, additional daily intake amounts of up to 20 micrograms (μg) of vitamin D per day in the form of food supplements, taking other sources of vitamin D into account, are harmless. Higher doses, especially very high amounts, should be taken under medical supervision and while taking the individual's vitamin D status into account.

Can coronaviruses cause respiratory tract infections by transmission via drinking vessels in gastronomy, or in community catering facilities, such as canteens or refectories?

The BfR is not yet aware of any such infection chain. According to the current state of knowledge, the oral/alimentary transmission route (via the oesophagus and stomach) does not play a role in the current outbreak of SARS-CoV-2. Transmission primarily occurs via droplets resulting from coughing and sneezing, which are absorbed by other people via the mucous membranes of the respiratory tract and, sometimes, the eyes, nose or mouth.

A virus contamination from drinking vessels, such as drinking glasses, in gastronomy would need the usage by an infected person, whereby the virus is transmitted to the glass via the hands or saliva. Transmission to another person through mucous membrane contact with the glass may then - theoretically - occur if this vessel has not been sufficiently cleaned in the meantime. However, infections with SARS-CoV-2 via this transmission method have not yet been detected.

As enveloped viruses, in which the genetic material is coated by a layer of fat (lipid layer), coronaviruses react sensitively to substances that dissolve fat, such as alcohols or surface-active agents, which are contained in soaps and dishwashing detergents as grease removers. Although specific data is not yet available for SARS-CoV-2, it is highly likely that these substances damage the virus surface and render the virus inactive.

Regarding the related SARS coronavirus, a laboratory study demonstrated that treatment with a conventional detergent for 5 minutes at room temperature led to full deactivation of the virus (<https://academic.oup.com/cid/article/41/7/e67/310340>). Longer periods and higher temperatures could increase the efficiency of virus deactivation. Cleaning drinking vessels in dishwashers or glass washing machines at 60 degrees Celsius or a higher temperature is, therefore, particularly efficient. If this is not possible, water with high temperature ($> 45\text{ }^{\circ}\text{C}$, but no higher than $50\text{ }^{\circ}\text{C}$, in order to protect the hands), along with detergent, should be used in manual rinsing processes. When using colder water, particular care must be taken to ensure that a sufficient amount of detergent is used, that glasses are left in the sink for longer time, and that glasses are carefully cleaned mechanically, and thereafter dried.

Further information can be found in the BfR opinion 'Hygienic effectiveness of rinsing devices for cleaning drinking glasses in catering' (in German):

- https://www.bfr.bund.de/cm/343/hygienische_wirksamkeit_von_spielgeraeten_zum_reinigen_von_trinkglaesern_in_der_gastronomie.pdf

Are special precautionary measures necessary with regard to dishes or cutlery in care facilities for the elderly?

All the usual measures and rules of conduct for protecting against noroviruses or influenza viruses in care facilities for the elderly also help against transmission of SARS-CoV-2.

Can you get infected with SARS-CoV-2 via contaminated frozen food?

So far there is no evidence of chains of infection for SARS-CoV-2 through food consumption, including frozen food. The previous coronaviruses SARS and MERS are resistant to cold and can remain infectious at minus $20\text{ }^{\circ}\text{C}$ for up to 2 years in a frozen state. Compliance with the general rules of hygiene for preparing food should be taken into account.

- <https://www.bfr.bund.de/cm/364/protection-against-foodborne-infections.pdf>

In the current situation, does it make sense to use disinfectants at home as well?

Even in the current situation, the BfR sees no need for healthy people to use disinfectants in their own homes. Common hygiene measures, such as correct and frequent handwashing with soap and regularly cleaning surfaces and door handles with standard household surfactant-based washing and cleaning agents, offer sufficient protection against transmission of SARS-CoV-2 via a smear infections.

In exceptional cases, the targeted use of disinfectants in homes may be appropriate if recommended by a doctor. Recommendations on the use of biocidal substances at home are set out in FAQs on the topic (https://www.bfr.bund.de/de/fragen_und_antworten_zu_nutzen_und_risiken_von_desinfektionsmitteln_im_privathaushalt-190275.html - in German).

The disinfection measures necessary if an infected person lives in a quarantined home should be discussed with the responsible health department or responsible doctor.

Further information on viruses is available on the BfR website

https://www.bfr.bund.de/en/a-z_index/viruses-130212.html



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About the BfR

The German Federal Institute for Risk Assessment (BfR) is a scientifically independent institution within the portfolio of the Federal Ministry of Food and Agriculture (BMEL) in Germany. It advises the German federal government and German federal states (“Laender”) on issues of food, chemical and product safety. The BfR conducts its own research on topics that are closely linked to its assessment tasks.

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