

Essential Sanitation Practices to Minimize COVID-19 Transmission



With Debra Smith, Global Hygiene Specialist at Vikan

Introduction



Debra Smith, Global Hygiene Specialist, Vikan

With 30 years of food safety and research training experience, Deb has previously worked in the food industry, for DEFRA, and at Campden BRI.

She is a qualified Microbiologist and FSSC 22000 auditor, has authored numerous food safety and hygiene publications, and presented her research internationally. At Vikan Deb is responsible for providing expert hygiene advice and support to the food industry.



Brian Sallee, Co-founder, Dozuki

Brian is an expert in the fields of standard work and process improvement software.

He has worked with hundreds of industrial and manufacturing companies to help them improve their procedures, train employees to standards, gather and analyze data, and employ continuous improvement principles.

What We'll Cover

- How COVID-19 is spread
- Manual vs. Mechanical cleaning methods
- Chemical disinfection techniques
- Whole room disinfection techniques
- PPE maintenance
- Waste disposal
- Additional decontamination best practices
- Q&A



Minimising the risk of SARS-CoV-2 (COVID-19) transmission through good cleaning and disinfection practices

Deb Smith
Global Hygiene Specialist

Who am I?



Deb Smith
Global Hygiene Specialist

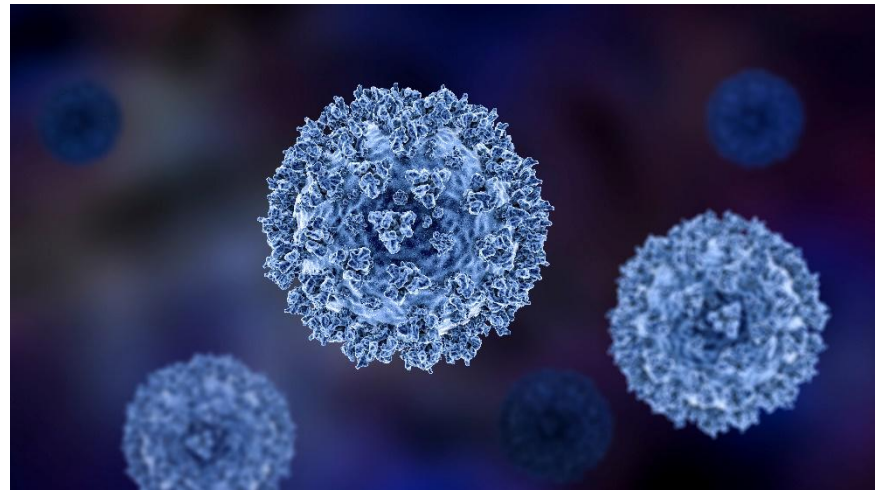


Microbiologist
Food Environments

- >35 years food safety training & experience
 - Poultry processing
 - UK Government
 - CampdenBRI
- Food Safety auditor
 - FSSC22000
- 9 years @ Vikan – Technical specialist
- Advice, training & support to the food industry,
 - GFSI
 - IAFP
 - EHEDG
 - IFST

What are SAR-CoV-2 and Covid-19?

- SARS-CoV-2^{1,2} is a new strain of coronavirus - discovered in China, 2019.
- COVID-19^{1,2} is the disease associated with SARS-CoV-2.
- Main symptoms³,
 - fever;
 - cough;
 - chest tightness
 - shortness of breath (dyspnoea);
 - muscle pain (myalgia);
 - Fatigue;
 - loss of smell and taste; and
 - pneumonia;
 - death - 3.4% vs 1% (WHO).



How is the virus spread?

- The primary route of virus transmission is via inhalation of the aerosols and droplets created when an infected individual coughs or sneezes³.

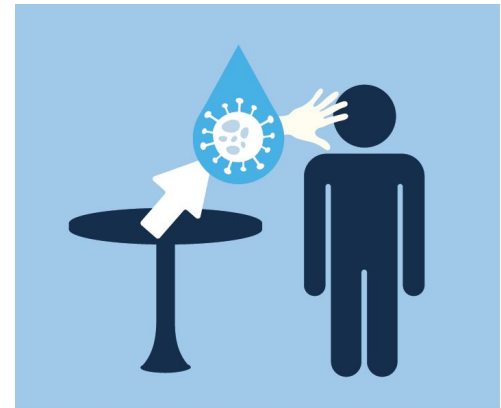
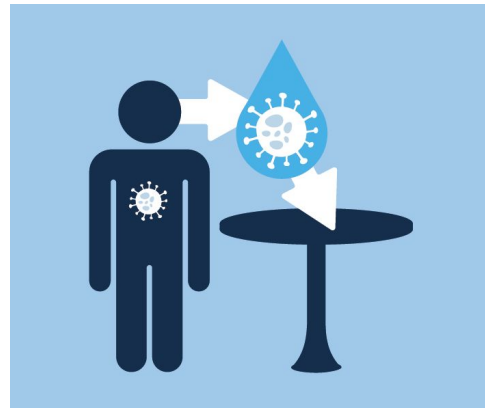
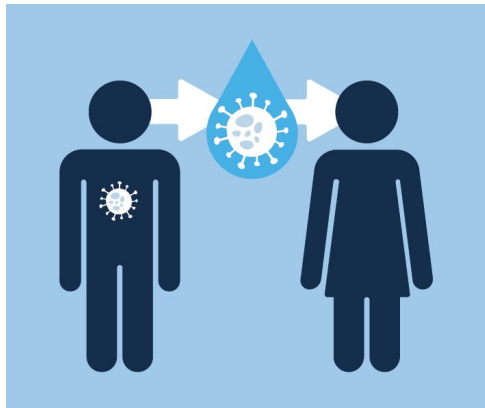
A single cough can produce up to 3,000 droplets⁴ and these droplets can land on the surrounding people, textiles and surfaces.



Photo credit: James Gathany

How is the virus spread?

- Transmission of the virus can then also occur through touching of the contaminated item, and subsequent touching of the mucous membranes of the mouth, nose or eyes³.



Virus spread by food and packaging

- The European Food Safety Authority (EFSA) states that there is currently no evidence that food is a likely source or route of SARS-CoV-2 transmission^{5,6}.
- The UK Food Standards Agency (FSA) consider that the probability that UK consumers will receive potentially infectious exposure of SARS-CoV-2 via the consumption of food or the handling of food contact materials or packaging is very low⁷. However, the data on which the risk assessment is based is limited.
- Food Safety Management Systems (FSMS), based on Hazard Analysis and Critical Control Point (HACCP) principles⁸, are underpinned by pre-requisite programmes that include [good hygienic practices⁹ i.e., cleaning and sanitation; personnel hygiene, and fitness to work policies.](#)
- These should already be in place in all commercial food production and handling environments. These practices significantly reduce the risk of food contact material or food article contamination and are effective for the control



Virus spread by food and packaging

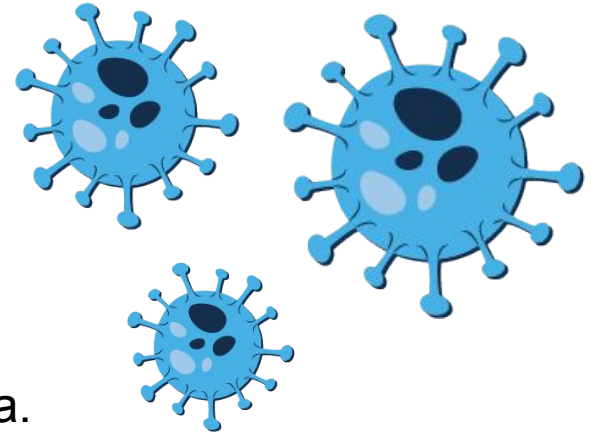
- Additional precautions you can take,
 - wash or wash and peel fresh fruit and vegetables prior to consumption¹⁰;
 - choose wrapped baked products / wrap baked products prior to display and sale¹⁰.
 - If the products are hand packed, hands should be washed and dried thoroughly before handling the product.
 - Wipe down packaging and leave to air dry; and
 - wash your hands after handling packed goods.
- Food Standards Scotland¹¹ recommend to minimise direct contact with open food by using tongs and utensils.
- SARS coronaviruses are easily inactivated by heat¹². Cooking or heating of food, to a temperature $>56^{\circ}\text{C}$ for a minimum 15 mins (or thermal equivalent?), should destroy the virus on the surface of the food.

How long can SARS-CoV-2 remain viable in the environment?

- SARS-CoV-2 (specifically) can remain viable¹³ on,
 - cardboard for up to 24 hours;
 - plastic and stainless-steel surfaces for 2-3 days;
 - copper surfaces for ~ 4 hours.
 - Viability on clothing and hair is not yet known.
- The viability of viruses in the environment depends on the,
 - type of surface;
 - temperature;
 - relative humidity;
 - presence of organic matter, e.g. food, biological fluids, biofilm; and
 - specific strain of virus.



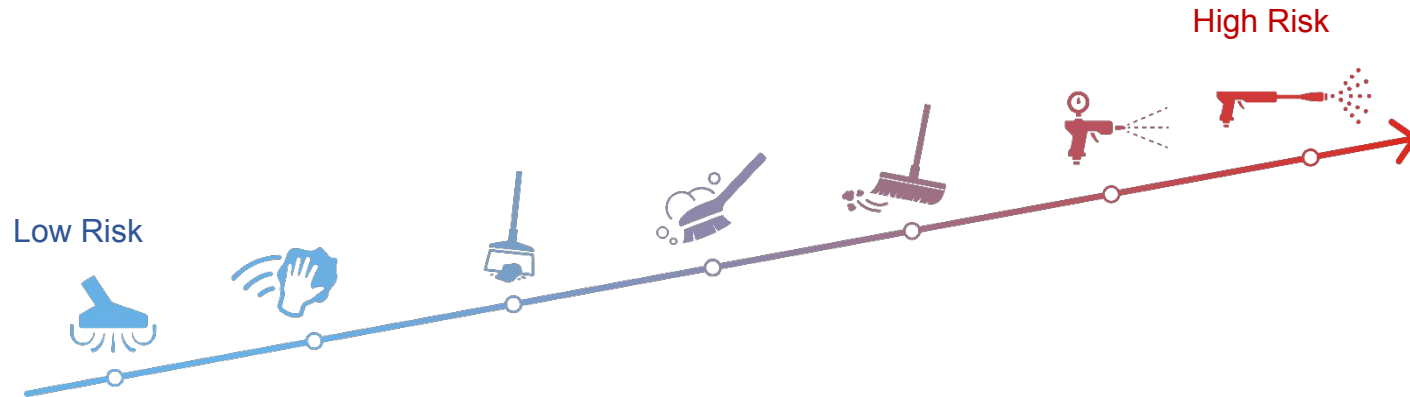
About viruses



- Viruses are non-living particles that need a host (living cell) to reproduce.
- They are tiny - up to 50 times smaller than bacteria.
- Their small size aids their transfer to and harbourage on surfaces.
- The presence of organic matter, e.g., food and biological fluids, is likely to offer the virus some protection from disinfectants and surface antimicrobials.
- Fortunately, viruses are effectively removed from surfaces through good cleaning practices.
- Enveloped viruses, such as SARS-CoV-2, are among the least resistant to disinfection. Many disinfectants achieve their inactivation within minutes^{14,15}.
- Consequently, routine cleaning and disinfection practices, using existing procedures, chemicals and cleaning equipment, should continue as usual, with consideration to a few additional measures.

Cleaning methods and equipment

- All cleaning activities can spread contamination. Choose methods that minimise splash and spray.



- To minimise the risk of virus harbourage and transfer,
 - Clean re-useable cleaning equipment and PPE before first use;
 - Choose equipment that is single use; or
 - *hygienically designed (easy to clean and disinfect).

*Further information on the selection of hygienically design cleaning tools can be found at:

<http://viewer.ipaper.io/vikan/food-safety-information/ultra-hygiene/ultra-hygiene-advertorial-en-300/#/>

Cleaning methods and equipment

- Visibly dirty surfaces should always be cleaned prior to disinfection. This can be achieved through,
 - manual cleaning e.g.,
 - wet cleaning: water; detergent; scrubbing; wiping; or
 - dry cleaning: brushing; scraping; wiping; or
 - mechanical cleaning e.g.,
 - wet cleaning: use of wet & dry vacuum cleaners, floor scrubbers; *pressurised water*;
 - dry cleaning: use of vacuum cleaners.



Microfibre for cleaning

- Microfibre should be effective at removing viruses from surfaces in the same way as it is for bacteria, i.e., through
 - electrostatic attraction (when used dry); or
 - capillary action (when used damp).
- There are very few peer reviewed published studies^{16,17} on the use of microfibre for virus removal and none in relation to SARS-CoV-2.
- Microfibre (both re-useable and disposable) used damp or dry, without the use of chemical disinfectants, is likely to remove the virus from the surface but not inactivate it.
- Consequently, Vikan recommends the following,
 - **Disposable microfibre**: Use a separate disposable microfibre cloth or mop for each different surface cleaned and dispose of immediately after use.
 - **Re-useable microfibre**: Change frequently, and launder after use, using a minimum wash cycle of 56°C for 15 minutes (or thermal equivalent?), to ensure destruction of the virus before re-use.
 - Clean and disinfect hands and equipment, e.g., floor mop frames, thoroughly after use.



Chemical disinfection



- Many disinfectants are active against coronaviruses and achieve their effective inactivation within minutes^{14,15}.
- For those in Europe and countries using the EN norms, use a disinfectant that has approval (partial approval for enveloped viruses) to EN 14476:2019.
- For those in the US and countries that follow the guidance of the US-EPA, visit: <https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2> and use your EPA registration number to identify suitable disinfectants.
- Those currently recommended by the World Health Organisation (WHO), for environmental disinfection associated with SARS-CoV-2 in healthcare facilities¹⁸, include:
 - 70% ethyl alcohol.
 - Sodium hypochlorite at 0.5% (equivalent 5,000ppm).

Chemical disinfection



- Alcohol based products (60 - 85%)
 - These disintegrate the viruses protective lipid coating and can be used for rapid disinfection of relatively small surfaces, including hands.
 - They can be applied using a spray bottle/dispenser, or a cloth (preferably disposable), impregnated with the alcohol.
 - Use a fresh cloth for each piece of equipment/surface disinfected.
- Sodium hypochlorite/Bleach (NaClO: 1,000 - 5,000 ppm)
 - Bleach and other strong oxidisers will also break down the essential components of the virus and inactivate it.
 - Guidance from the European Centre for Disease Prevention and Control (ECDC) states that a 1:50 dilution of household bleach = 1,000ppm NaClO¹⁹.
 - This can also be applied to small surfaces using a spray bottle or cloth.
 - For disinfection of larger equipment and surfaces (at least once a day) it can be applied through use of a larger spray system (chlorinated foams - industrial use), or manually using a cloth or wash brush.

Chemical disinfection



- Peracetic acid and hydrogen peroxide
 - Also both very effective.
 - In food and beverage production facilities they may be more appropriate, as they will reduce the risk of food taint.
- Quaternary Ammonium disinfectants
 - Effective.
 - These attack the protein and lipid structures of the virus and disrupt its ability to infect.
- *Speak to chemical suppliers for details of in use concentrations (vary from formulation to formulation).*
- *In all cases the contact time of the disinfectant needs to be sufficient to allow it to inactivate the virus prior to rinsing. This can range from 30 seconds to 10 minutes. This should be checked with the chemical supplier.*

Active	Concentration	Time	Viricidal action	Source
Peracetic acid	0,01 %	1 min	Activity against enveloped viruses (EN14476 - Vaccinia)	[4]
Peracetic acid	0,15 %	5 min	General viricidal activity (EN14476 – Poliovirus, Adenovirus and Murine Norovirus)	[5]
Benzalkonium chloride	0,05 – 0,1 %	10 min	Activity against coronaviruses of animal origin. Activity against SARS-CoV-2	[6,7]
Didecyl dimethyl ammonium chloride	0,0125 %	10 min	Activity against enveloped viruses	[8]
Ethanol	70 %	1-5 min	General viricidal activity. Activity against SARS-CoV-2	[7,9]
Sodium hypochlorite	0,1 – 0,5 %	1 min	SARS-CoV-2 decontamination on surfaces, Activity against coronaviruses of animal origin	[6,10]
Isopropanol	50 %	10 min	Activity against coronaviruses of animal origin	[6]
Glutaraldehyde	0,5 %	1 min	Activity against SARS-CoV	[11]
Hydrogen peroxide	0,5 %	1 min	SARS-CoV-2 decontamination on surfaces	[10]
Hydrogen peroxide	0,5 %	1 min	Activity against Human coronavirus (HCov 229E)	[11]

<https://www.christeysnsoodhygiene.co.uk/wp-content/uploads/downloads/2020/03/Information%20Briefing%20-%20Cleaning%20and%20Disinfection%20Regime%20With%20Regard%20to%20novel%20Coronavirus%20-%20V3.pdf>

Courtesy of Christeysns



Whole room disinfection

- The use of a fine mist of liquid disinfectant (fogging) or biocidal gas (gassing) to disinfect a whole room.
- This technique can be used to reduce the level of micro-organisms in the air and on surfaces.
- Whole room disinfection can be used in addition to normal cleaning and disinfection practices but should not replace them.
- Not all disinfectants are suitable for whole room disinfection using fogging (Table 1.), including those recommended by WHO for control of SARS-CoV-2.
- Hydrogen peroxide, which can be used for whole room disinfection in gaseous form, has been shown to be effective against viruses²⁰.

Table 1: Chemical disinfectants suitable for whole room fogging

Disinfectant	Suitability for fogging
QAC	Yes
Amphoteric	Yes
Biguanide	Yes
Iodophor	Partially
PAA	Partially
Alcohol	No
Chlorine	No

Courtesy of CampdenBRI

Microfibre for disinfection

- If microfibre (both re-useable, and single use, disposable cloths and mops) is used in combination with a chemical disinfectant for SARS-CoV-2 control, the disinfectant should be one that is effective against viruses.
- These can either be applied directly to the surface and then wiped off with a mop/cloth, or dosed onto the mop/cloth.



Note:

Microfibre efficacy is based on the ability of the microfibres to attract and hold contamination through electrostatic (why dry) and capillary (when damp) action. The use of chemicals that contain alcohol, chlorine and strong acids and alkalis may damage the fibres and effect their efficacy.

Thermal disinfection

- Heat (56°C for 15 mins or thermal equivalent?) can also be used to inactivate SARS coronavirus¹². Use,
 - wash/rinse water at >56°C;
 - steam disinfection after cleaning.
- Small, washable equipment and utensils can be decontaminated using an industrial or domestic dishwasher using minimum wash cycle of 56°C for 15 mins.
- Laundry (including re-useable protective clothing and cleaning cloths and mops), and small plastic cleaning tools and utensils, can also be decontaminated using a washing machine with the same minimum wash cycle settings.
 - Do not shake dirty laundry as this could spread virus particles through the air.
 - Clean and disinfect the items used to transport the dirty laundry/equipment to the washer.



Ultraviolet disinfection

- Short wavelength UVC (254nm) light has been shown to inactivate SARS-CoV-1²¹
No studies have yet been conducted involving SARS-CoV-2 but it seems likely that UV will be equally as effective against it.

Antimicrobial surfaces and equipment

- The antimicrobials impregnated into some surfaces and equipment may also serve to protect against virus transmission, but no studies have yet been conducted involving SARS-CoV-2.
- Surface antimicrobials work well on relatively clean surfaces and provide an additional 24/7 antimicrobial action. However...
- organic matter (e.g., food; biofilms, biological fluids) shields the virus from the antimicrobial; and
- they need time (hours) to work effectively, by which time the virus may have already been transferred.
- Standard cleaning and disinfection techniques are faster and more effective for minimising the risk of virus transmission, especially for frequently touched surfaces.



Cleaning equipment and PPE maintenance

- Cleaning equipment/materials and the PPE used during cleaning, can themselves become vectors for SARS-CoV-2 transmission.
- To minimise the risk of virus harbourage and transfer, clean re-useable equipment,
 - Before first use;
 - **between use by different workers;**
 - after final use for the day.
 - Regularly inspect and replace.



<http://viewer.ipaper.io/vikan/white-papers/cleaning-tool-maintenance/cleaning-tool-maintenance-whitepaper-en-300/#/>

Waste disposal

To minimise the risk of virus harbourage and transfer,

- dispose of single use equipment /clothing immediately after use, e.g.,
 - cloths; mops; gloves; arm covers; aprons; boot covers; hair nets & beard snoods; ear plugs.
- Disposable items that have been used with a disinfectant, or disinfected after use will be safe to dispose of immediately, through normal waste disposal routes. The residual disinfectant will continue to work to inactivate the virus.
- For disposable items not used with a disinfectant, these can be double bagged and quarantined for 72 hours as a precaution, before disposal via the normal route²².



What additional decontamination should I do?

- **Clean and disinfect frequently touched surfaces more often, ideally after**
contact by each different individual. Include,
 - door handles;
 - handrails;
 - trolley and basket handles;
 - door push plates;
 - switches;
 - vending machines;
 - instrument panels;
 - touch screens/l-pads;
 - computer keyboards;
 - taps;
 - toilet flush mechanisms;
 - cleaning tools;
 - utensils;
- Also consider cleaning and disinfecting personal items, e.g., car keys, coins and payment cards, phones etc..



What additional decontamination should I do?

- Clean all **communal and frequently used areas** more frequently. These include,
 - computer works stations;
 - tills;
 - toilets facilities;
 - changing rooms;
 - offices;
 - canteens; and
 - vehicles (steering wheel, gear lever, door handles).
- Food Standards Scotland²³ suggest that cleaning of touch points should take place every 2 hours.
- Recent IFST webinar:
 - High frequency touch - every 15-30 mins.
 - Medium frequency touch - every 2 hours.
 - Low frequency touch - end of shift (~8 hours).

Additional decontamination if someone is diagnosed with COVID-19²²

- Areas where a symptomatic person has passed through, spent minimal time, and where there are no visible body fluids can be cleaned as normal.
- All surfaces that a symptomatic person has touched must be cleaned and disinfected.
- Wear disposable plastic gloves, apron, and use disposable cloths and mops in combination with a detergent.
- Disinfect the surface after cleaning using a suitable disinfectant.
- For contaminated textiles launder, use steam cleaning or, if heavily contaminated, dispose of.
- Dispose of disposable cleaning equipment/gloves/aprons/cloths/mops after use.
- Clean and disinfect any reuseable cleaning equipment/PPE after use, e.g., mop frames.
- Wash your hands.

What else can be done?

Be aware of how SARS-CoV-2 can be spread and of the precautions to take to minimise this²⁴.

- **Wash & dry your hands more often.** Use soap, water, disposable towels.
- Consider installation of **additional hand hygiene stations**, especially at entrances and exits.
- Consider implementing a disposable **gloving** policy.
 - Careful consideration must be given to when the gloves are used and removed, to ensure that the gloves themselves do not become a vector of viral transmission.
- **Use hand sanitiser or wipes.**
 - These should contain alcohol (min 60%); and only be used where hand washing facilities are limited.
- Gloving and the use of hand sanitisers and wipes should not replace good hand washing and drying practices.



What else can be done?

- Cover your mouth and nose when coughing and sneezing.
 - Cough into a tissue and dispose of immediately after use; or
 - Cough into your elbow; or
 - Cover your mouth with your hand and wash your hands immediately.
- Keep your distance.
 - Avoid close contact with others. Stay at least 2 meters away.
- Understand the sources of contamination.
 - Aerosols and droplets from coughing and sneezing; and
 - contaminated surfaces,
- and how transfer can occur.
 - through inhalation of virus particles in aerosols and droplets
 - through transfer of virus particles from coughs and sneezes to surfaces and hands;
 - from surfaces and hands to mucus membranes (nose, mouth, eyes); and
 - from hands back to surfaces.



Further information and advice

Follow advice from trusted sources.

- Government bodies
 - Public Health England:
<https://www.gov.uk/government/organisations/public-health-england>
 - FSA: <https://www.food.gov.uk/>
 - FSS: <https://www.foodstandards.gov.scot/>
- WHO: <https://www.who.int/>
- ECDC: <https://www.ecdc.europa.eu/en>
- CDC: <https://www.cdc.gov/coronavirus/2019-nCoV/prepare/cleaning-disinfection.html>
- Established professional suppliers of cleaning and disinfection products and services.



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Questions?

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