

Survival of SARS-CoV-2 on food surfaces:

References

Aboubakr H.A., Sharafeldin T.A. and Goyal S.M., 2020

Stability of SARS-CoV-2 and other coronaviruses in the environment and on common touch surfaces and the influence of climatic conditions: A review. *Trans bound. Emerg. Dis.* 68(2):296-312.

<https://doi.org/10.1111/tbed.13707>

Abraham J.P., Plourde B.D. and Cheng L., 2020

Using heat to kill SARS-CoV-2. *Reviews in Medical Virology*: p. e2115,

<https://doi.org/10.1002/rmv.2115>

Alberto M.R., Canavosio M.A.R. and Manca de Nadra M.R., 2006

Antimicrobial effect of polyphenols from apple skins on human bacterial pathogens. *Electronic Journal of Biotechnology* 9 (3), Issue 3.

<https://doi.org/10.2225/vol9-issue3-fulltext-1>

Alhadrami H.A., Sayed A.M., Sharif A.M., Azhar E.I. and Rateb M.E., 2021

Olive-Derived Triterpenes Suppress SARS COV-2 Main Protease: A Promising Scaffold for Future Therapeutics. *Molecules*, 26, 2654. <https://doi.org/10.3390/molecules26092654>

Anelich L.E.C.M., Lues R., Farber, J.M. and Parreira V.R., 2020

SARS-CoV-2 and Risk to Food Safety. *Frontiers in Nutrition*.

<https://doi.org/10.3389/fnut.2020.580551>

Anon, 2022a

Do Coca Cola cans and bottles contains BPAs.

[Do Coca-Cola cans and bottles contain BPA? | FAQ | Coca-Cola Canada](#)

Anon, 2022b

Pure Pak™ cartons.

[Pure-Pak® cartons - Elopak](#)

Arnaboldi S., Mangeri L., Galuppini E., Righi F., Tilola M., Scarazzato A., Bertasi B., Finazzi G., Varisco G., Filipello V. and Losio M-N., 2022

Is SARS-CoV-2 a Concern for Food Safety? A Very Low Prevalence from a Food Survey during the COVID-19 Pandemic in Northern Italy. *Foods*. 2022; 11(14):2096.

<https://doi.org/10.3390/foods11142096>

ASTM E2197, 2018

Standard Quantitative Disk Carrier Test Method for Determining Bactericidal, Virucidal, Fungicidal, Mycobactericidal, and Sporocidal Activities of Chemicals.

[Standard Quantitative Disk Carrier Test Method for Determining Bactericidal, Virucidal, Fungicidal, Mycobactericidal, and Sporocidal Activities of Chemicals \(astm.org\)](#)

Baker C.A. and Gibson K.E., 2022

Persistence of SARS-CoV-2 on Surfaces and Relevance to the Food Industry, *Current Opinion in*

Food Science 100875

<https://doi.org/10.1016/j.cofs.2022.100875>

Barr I.G., Rynehart C., Whitney P. and Druce J., 2020
SARS-CoV-2 does not replicate in embryonated hen's eggs or in MDCK cell lines.
Eurosurveillance 25, 2001122.

<https://doi.org/10.2807/1560-7917.ES.2020.25.25.2001122>

Bedoya L.M., Beltrán M., Obregón-Calderón P., García-Pérez J., De La Torre H.E., González N., et al., 2016

Hydroxytyrosol: A new class of microbicide displaying broad anti-HIV-1 activity. *AIDS* 30, 2767–2776.

<https://doi.org/10.1097/qad.0000000000001283>

Biryukov J., Boydston J.A., Dunning R.A. et al., 2020

Increasing Temperature and Relative Humidity Accelerates Inactivation of SARS-CoV-2 on Surfaces. *mSphere* 5(4): e00441-20.

<https://doi.org/10.1128/mSphere.00441-20>

Blondin-Brosseau M., Harlow J., Doctor T. and Nasheri N., 2021

Examining the persistence of human Coronavirus 229E on fresh produce. *Food Microbiology* 98:e103780

<https://doi.org/10.1016/j.fm.2021.103780>

Bonvino N.P., Liang J., McCord E.D, Zafiris E., Benetti N., Ray N.B. et al., 2018

OliveNet™: a comprehensive library of compounds from *Olea europaea*. *Database*, 1 – 0.

<https://doi.org/10.1093/database/bay016>

Brown J.D, Swayne D.E, Cooper R.J., Burns R.E. and Stallknecht D.E., 2007

Persistence of H5 and H7 avian influenza viruses in water. *Avian Dis.*, 51 (1 Suppl.), 285-289.

<https://doi.org/10.1637/7636-042806R.1>

Bueckert M., Gupta R., Gupta A., Garg M. and Mazumder A., 2020

Infectivity of SARS-CoV-2 and Other Coronaviruses on Dry Surfaces: Potential for Indirect Transmission. *Materials (Basel, Switzerland)*, 13 (22), 5211-5217.

<https://doi.org/10.3390/ma13225211>

Casanova L. M., Jeon S., Rutala W. A., Weber D. J. and Sobsey M. D., 2010

Effects of air temperature and relative humidity on coronavirus survival on surfaces. *Applied and Environmental Microbiology*, 76(9), 2712–2717. <https://doi.org/10.1128/AEM.02291-09>

Çelebioğlu H.Y., Lee S. and Chronakis I.S., 2020

Interactions of salivary mucins and saliva with food proteins: a review, *Critical Reviews in Food Science and Nutrition*, 60:1, 64 – 83.

<https://doi.org/10.1080/10408398.2018.1512950>

Chin A., Chu J., Perera M., Hui K., Yen H. L., Chan, M. et al., 2020

Stability of SARS-CoV-2 in different environmental conditions. *The Lancet. Microbe*, 1(1), e10.

[https://doi.org/10.1016/S2666-5247\(20\)30003-3](https://doi.org/10.1016/S2666-5247(20)30003-3)

Colunga Biancatelli R.M.L., Berrill M., Catravas J.D. and Marik P.E., 2020

Quercetin and Vitamin C: An Experimental, Synergistic Therapy for the Prevention and Treatment of SARS-CoV-2 Related Disease (COVID-19). *Front. Immunol.* 11:1451.

<https://doi.org/10.3389/fimmu.2020.01451>

Das U.N., 2020

Can Bioactive Lipids Inactivate Coronavirus (COVID-19)? Arch Med Res. 51,282-286.

<https://doi.org/10.1016/j.arcmed.2020.03.004>

de Goffau M. C., Yang X., van Dijk J. M. and Harmsen H. J., 2009

Bacterial pleomorphism and competition in a relative humidity gradient. Environmental Microbiology, 11(4), 809–822.

<https://doi.org/10.1111/j.1462-2920.2008.01802.x>

Dhakal J., Jia M., Joyce J.D., Moore G.A., Ovissipour R. and Bertke A.S., 2021 Survival of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) and Herpes Simplex Virus 1 (HSV-1) on foods stored at refrigerated temperature. Foods,10(5):1005.

<https://doi.org/10.3390/foods10051005>

DMNA Division of Military and Naval Affairs, 2006

Storing food at the proper temperature.

[NFSEM_A_proper_temps_F \(ny.gov\)](https://www.nfsem.gov/nfsem_a_proper_temps_f)

Dulbecco R. and Vogt M.,1953

Some problems of animal virology as studied by the plaque technique.

Cold Spring Harbor Symp. Quant. Biol., 18, 273-279.

<https://doi.org/10.1101/sqb.1953.018.01.039>

Food Standards Agency, 2020

What is the risk of food or food contact materials and surfaces being a source or transmission route of SARS-CoV-2 for UK consumers?

[Qualitative risk assessment on the risk of food or food contact materials as a transmission route for SARS-CoV-2 | Food Standards Agency](https://www.food.gov.uk/news/news-detail/104)

Food Standards Agency, 2021

Safer food, better business for retailers: chilled storage and display.

[Safer food, better business for retailers | Food Standards Agency](https://www.food.gov.uk/news/news-detail/104)

Food Standards Scotland, 2016

Scotland - Chill holding requirements.

[Guidance on Temperature Control \(foodstandards.gov.scot\)](https://www.foodstandards.gov.scot/guidance-on-temperature-control)

Geueke B., 2016

Dossier – Can coatings. Food Packaging Forum.

<https://doi.org/10.5281/zenodo.200633>

Gidari A., Sabbatini S., Bastianelli S., Pierucci S., Busti C., Bartolini D. et al., 2021

SARS-CoV-2 Survival on Surfaces and the Effect of UV-C Light. Viruses, 13(3), 408.

<https://doi.org/10.3390/v13030408>

Glenister D.A., Salamon K.E., Smith K., Beighton D. and Keevil C.W., 1988

Enhanced Growth of Complex Communities of Dental Plaque Bacteria in Mucin-Limited Continuous Culture.

Microbial Ecology in Health and Disease, 1:1, 31-38.

<https://doi.org/10.3109/08910608809140176>

GMP Compliance, 2017

What are the regulatory Definitions for "Ambient", "Room Temperature" and "Cold Chain"?

[What are the regulatory Definitions for "Ambient", "Room Temperature" and "Cold Chain"? - ECA Academy \(gmp-compliance.org\)](https://www.gmp-compliance.org/what-are-the-regulatory-definitions-for-ambient-room-temperature-and-cold-chain/)

Goyal S.M. and Aboubakr H.A., 2016
Methods for Virus Recovery from Foods.
In: Goyal S., Cannon J. (eds) Viruses in Foods. Food Microbiology and Food Safety. Springer, Cham.

[Methods for Virus Recovery from Foods | SpringerLink](#)

Hashmi M. A., Khan A., Hanif M., Farooq U. and Perveen S., 2015
Traditional uses, phytochemistry, and pharmacology of *Olea europaea* (olive). Evid. Based Complement. Altern. Med. 2015:541591.

<https://doi.org/10.1155/2015/541591>

Highmore C. J., Warner, J. C., Rothwell S. D., Wilks S. A. and Keevil C. W., 2018
Viable-but-Nonculturable *Listeria monocytogenes* and *Salmonella enterica* Serovar Thompson Induced by Chlorine Stress Remain Infectious.
mBio, 9 (2), e00540-18.

<https://doi.org/10.1128/MBIO.00540-18>

International Society for Infectious Diseases, 2019
Undiagnosed Pneumonia - China (Hubei): Request For Information.
ProMED 20191230.6864153

[Promed Post - ProMED-mail \(promedmail.org\)](#)

ISO 7218:2007. Microbiology of food and animal feeding stuffs, 2007
General requirements and guidance for microbiological examinations.

[ISO - ISO 7218:2007 - Microbiology of food and animal feeding stuffs — General requirements and guidance for microbiological examinations](#)

Jia M., Taylor T.M., Senger S.M., Ovissipour R. and Bertke A.S., 2022
SARS-CoV-2 remains infectious on refrigerated Deli food, meats, and fresh produce for up to 21 days. Foods, 11, 286.

<https://doi.org/10.3390/foods11030286>

Kampf G., Todt D., Pfaender S. and Steinmann E., 2020
Persistence of coronaviruses on inanimate surfaces and their inactivation with biocidal agents. Journal of Hospital Infection, 104, 246-251.

<https://doi.org/10.1016/j.jhin.2020.01.022>

Kang D-H., Dougherty R.H. and Fung D.Y.C., 2007
Comparison of Pulsifier and Stomacher to detach microorganisms from lean meat tissues. Journal of Rapid Methods & Automation in Microbiology 9, 27-32.

<https://doi.org/10.1111/j.1745-4581.2001.tb00225.x>

Kingsbury J.M., 2022
Potential for food borne transmission of COVID-19: Literature review update version 7. New Zealand Food Safety Science and Research Centre.

[Cawthron Short Report Template 15 page or less \(nzfssrc.org.nz\)](#)

Li F., Wang J., Liu Z. and Li N., 2020
Surveillance of SARS-CoV-2 Contamination in Frozen Food-Related Samples — China, July 2020 – July 2021[J]. China CDC Weekly, 2022, 4(22): 465-470.

<https://doi.org/10.46234/ccdcw2022.105>

Liu, Y., Li T., Deng Y., Liu S., Zhang D., Li H. et al., 2021
Stability of SARS-CoV-2 on environmental surfaces and in human excreta. The Journal of

Hospital Infection, 107, 105–107. <https://doi.org/10.1016/j.jhin.2020.10.021>

Määttä-Riihinen, K. R., Kamal-Eldin, A., Mattila, P. H., González-Paramás, A. M., & Törrönen, A. R. 2004

Distribution and contents of phenolic compounds in eighteen Scandinavian berry species. *Journal of Agricultural and Food Chemistry*, 52(14), 4477–4486.

<https://doi.org/10.1021/jf049595y>

MFMER - Mayo Foundation for Medical Education and Research, 2021

Humidifiers: Ease Skin breathing symptoms.

[Humidifiers: Ease skin, breathing symptoms - Mayo Clinic](#)

Moore G. and Griffith C., 2007

Problems associated with traditional hygiene swabbing: the need for in-house standardization. *Journal of Applied Microbiology*, 103, 1090-1103.

<https://doi.org/10.1111/j.1365-2672.2007.03330.x>

Morawska L., and Milton D. K., 2020

It Is Time to Address Airborne Transmission of Coronavirus Disease 2019 (COVID-19). *Clinical Infectious Diseases: an official publication of the Infectious Diseases Society of America*, 71(9), 2311–2313.

<https://doi.org/10.1093/cid/ciaa939>

MPDA Metal Packaging Manufacturers Association, 2022

2 -piece drinks cans.

[HOW 2piecedrinks low res \(mpma.org.uk\)](#)

Ogando N. S., Dalebout T. J., Zevenhoven-Dobbe J. C., Limpens R., van der Meer Y., Caly L., Druce J., de Vries J., Kikkert M., Bárcena M., Sidorov I., and Snijder E. J., 2020

SARS-coronavirus-2 replication in Vero E6 cells: replication kinetics, rapid adaptation and cytopathology. *The Journal of General Virology*, 101(9), 925–940.

<https://doi.org/10.1099/jgv.0.001453>

Onal H., 2020

Effect of Quercetin on Prophylaxis and Treatment of COVID-19

[Effect of Quercetin on Prophylaxis and Treatment of COVID-19 - Tabular View - ClinicalTrials.gov](#)

Poulson R.L., Tompkins S.M., Berghaus R.D., Brown J.D. and Stallknecht D.E., 2016

Environmental stability of swine and human pandemic influenza viruses in water under variable conditions of temperature, salinity, and pH. *Appl. Environ. Microbiol.* 82:3721–3726.

<https://doi.org/10.1128/AEM.00133-16>

Pursglove A., 2021

Why your supermarket is chillier than the Arctic. *Mail Online*

[Brrr! Why your supermarket is CHILLIER than the Arctic | Daily Mail Online](#)

Riddell S., Goldie S., Hill A., Eagles D. & Drew T. W., 2020

The effect of temperature on persistence of SARS-CoV-2 on common surfaces.

Virology Journal, 17(1), 145.

<https://doi.org/10.1186/s12985-020-01418-7>

Scientific Advisory Group for Emergencies (SAGE), 2020

[Role of Ventilation in Controlling SARS-CoV-2 Transmission](#)

[S0789_EMG_Role_of_Ventilation_in_Controlling_SARS-CoV-2_Transmission.pdf](#)

[\(publishing.service.gov.uk\)](#)

Sanchez G., Elizaquivel P. and Aznar R., 2012
A single method for recovery and concentration of enteric viruses and bacteria from fresh-cut vegetables. *International Journal of Food Microbiology* 152, 9-13.
<https://doi.org/10.1016/j.ijfoodmicro.2011.10.002>

Sattar S. A., Karim Y. G., Springthorpe V. S. and Johnson-Lussenburg C. M., 1987
Survival of human rhinovirus type 14 dried onto nonporous inanimate surfaces: effect of relative humidity and suspending medium. *Canadian Journal of Microbiology*, 33(9), 802–806.
<https://doi.org/10.1139/m87-136>

Schwarcz J. 2017
Why do they spray wax on apples?
[Why do they spray wax on apples? | Office for Science and Society - McGill University](#)

Sizun J., Yu M.W.N. and Talbot P.J., 2000
Survival of human coronaviruses 229E and OC43 in suspension and after drying on surfaces: a possible source of hospital-acquired infections. *Journal of Hospital Infection*, 46, 55-60.
<https://doi.org/10.1053/jhin.2000.0795>

Szpiro L., Pizzorno A., Durimel L., Julien T., Bouchami D., Marie Y. et al., 2020
Role of interfering substances in the survival of coronaviruses on surfaces and their impact on the efficiency of hand and surface disinfection. medRxiv 2020.08.22.20180042.
<https://doi.org/10.1101/2020.08.22.20180042>

Takeda Y., Jamsransuren Y., Matsuda S., Crea R. and Ogawa H., 2021
The SARS-CoV-2-inactivating activity of hydroxytyrosol-rich aqueous olive pulp extract (HIDROX®) and its use as a virucidal cream for topical application. *Viruses*, 13, 232.
<https://doi.org/10.3390/v13020232>

UKHSA, 2022
Coronavirus (COVID-19) in the UK: England Summary
[England Summary | Coronavirus \(COVID-19\) in the UK \(data.gov.uk\)](#)

van Doremalen N., Bushmaker T., Morris D. H., Holbrook M. G., Gamble A., Williamson B. N. et al., 2020
Aerosol and Surface Stability of SARS-CoV-2 as Compared with SARS-CoV-1. *The New England Journal of Medicine*, 382(16), 1564–1567. <https://doi.org/10.1056/NEJMc2004973>

Viral Titering-Plaque Assay Protocol, 2020
Creative Biogene Technology.
[Viral Titering-Plaque Assay Protocol - Creative Biogene \(creative-biogene.com\)](#)

Warnes S. L., Little Z. R. and Keevil C. W., 2015
Human coronavirus 229E remains infectious on common touch surface materials. *mBio*, 6(6), e01697-15.
<https://doi.org/10.1128/mBio.01697-15>

Woradechjumroen D., Li H. and Yu Y., 2014
Energy Interaction among HVAC and Supermarket Environment. *International Journal of Architectural, Civil and Construction Sciences* 8,(12) 1236 – 1243.
[Energy Interaction among HVAC and Supermarket Environment \(researchgate.net\)](#)

World Health Organization, 2020a
Origins of SARS-CoV-2 virus.
[Virus origin / Origins of the SARS-CoV-2 virus \(who.int\)](#)

World Health Organization, 2020b

Transmission of SARS-CoV-2: implications for infection prevention precautions: scientific brief.

[Transmission of SARS-CoV-2: implications for infection prevention precautions: scientific brief, 09 July 2020 \(who.int\)](#)

World Health Organization, 2020c

Guidelines for the storage of Essential Medicines and other Health Commodities.

[Essential Medicines and Health Products Information Portal \(digicollections.net\)](#)

Worldometer, 2020.

COVID-19 CORONAVIRUS PANDEMIC

[COVID Live - Coronavirus Statistics - Worldometer \(worldometers.info\)](#)

Yamada K., Ogawa H., Hara A., Yoshida Y., Yonezawa Y., Karibe, K. et al., 2009

Mechanism of the antiviral effect of hydroxytyrosol on influenza virus appears to involve morphological change of the virus. *Antiviral Research* 83, 35–44.

<https://doi.org/10.1016/j.antiviral.2009.03.002>

Yépez-Gómez M.S., Gerba C.P. and Bright K.R., 2013

Survival of Respiratory Viruses on Fresh Produce. *Food Environmental Virology* 5, 150–156.

<https://doi.org/10.1007/s12560-013-9114-4>

Yu F., Yan L., Wang N., Yang S., Wang L., Tang Y. et al., 2020

Quantitative Detection and Viral Load Analysis of SARS-CoV-2 in Infected Patients. *Clinical Infectious Diseases* : an official publication of the Infectious Diseases Society of America, 71(15), 793–798.

<https://doi.org/10.1093/cid/ciaa345>