9 Appendices

9.1 SARS-CoV-2 survival on food surfaces

9.1.1 Baseline parameters all foods

Baseline parameters for all food tests were determined and are shown in Table 4, Table 5, Table 6 and Table 7.

Table 4 Effect of food sample extracts (without SARS-CoV-2 virus) made by beads/vortexing on Vero E6

Food sample	Observable CPE %
Broccoli	0
Pepper	0
Apple	0
Raspberry	0
White bread crust	0
Brown bread crust	0
Pain au chocolat	0
Croissant	0
Sliced ham	0
Cheddar cheese	0
Olive	0
Brine	0

All tests were performed in triplicate. CPE – cytopathic effect

Table 5 Effect of food sample extracts (without SARS-CoV-2 virus) made by pulsification on Vero E6

Food sample	Any observable CPE %
Broccoli	0
Pepper	0
Apple	0
Raspberry	0
White bread crust	0
Brown bread crust	0
Pain au chocolat	0
Croissant	0
Sliced ham	0
Cheddar cheese	0

Food sample	Any observable CPE %
Olive	0
Brine	0*

All tests were performed in triplicate. CPE – cytopathic effect

* Brine - there was no direct effect on the viability of the Vero E6 cells, with no cell death nor plaques being observed. However, the observed monolayer was thinner and less confluent than that observed with Infection Medium alone.

Table 6 Effect of food sample extracts after beads/vortexing on SARS-CoV-2.

Food sample	Mean titre recovered (PFU/sample)	Mean % recovery
Infection Medium + SARS-CoV-2	4750	95
Broccoli + SARS-CoV-2	4750	95
Pepper + SARS-CoV-2	4250	85
Apple + SARS-CoV-2	69	1.4
Raspberry + SARS-CoV-2	4500	90
White bread crust + SARS-CoV-2	4500	90
Brown bread crust + SARS-CoV-2	4750	95
Croissant + SARS-CoV-2	4750	95
Pain au chocolat + SARS-CoV-2	4125	83.5
Ham + SARS-CoV-2	4750	95
Cheddar cheese + SARS-CoV-2	4607	92
Olive + SARS-CoV-2	225	4.5

All tests were performed in triplicate, with 5000 PFU added to each sample.

Table 7 Effect of food sample extracts after pulsification on SARS-CoV-2.

Food sample	Mean titre recovered (PFU/sample)	Mean % recovery
Infection Medium + SARS-CoV-2	900	90
Broccoli + SARS-CoV-2	860	86
Pepper + SARS-CoV-2	875	87.5
Apple + SARS-CoV-2	500	50

Food sample	Mean titre recovered (PFU/sample)	Mean % recovery
Raspberry + SARS-CoV-2	845	84.5
White bread crust + SARS-CoV-2	850	85
Brown bread crust + SARS-CoV-2	870	87
Croissant + SARS-CoV-2	860	86
Pain au chocolat + SARS-CoV-2	890	89
Ham + SARS-CoV-2	880	88
Cheddar cheese + SARS-CoV-2	880	88
Olive + SARS-CoV-2	37.5	3.75

All tests were performed in triplicate, with 1000 PFU added to each sample.

9.1.2 Fresh vegetables

9.1.2.1 Broccoli

The results for broccoli incubated for up to 7 days with SARS-CoV-2 can be seen in Table 8, Table 9, Table 10, Table 11, Table 12 and Table 13. For all tests, the means; SEM of the mean and log_{10} reduction of PFU over time are shown. The mean log_{10} decrease (shown to 2 significant figures (s.f.)) compares the PFU recovered at each time point to the PFU recovered at day 0, not to the initial inoculum. All tests were performed in triplicate. The limit of detection for this assay is 25 PFU/sample. Therefore, 2.3 is the maximum log_{10}-reduction detectable with this assay design, equivalent to 25 PFU or fewer infectious virus remaining. Log_{10} decrease was calculated to 2 s.f.

Table 8 Test B1: Broccoli, 23˚C, 53% RH

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 0	7167 +/- 1155	n/a
Day 1	67 +-/ 64	2.0
Day 2	<25	>2.5
Day 3	<25	>2.5
Day 4	104 +/- 79	1.8
Day 5	<25	>2.5
Day 6	<25	>2.5

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 7	<25	>2.5

Table 9 Test B2: Broccoli, 23˚C, 31% RH

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 0	7167 +/- 1155	n/a
Day 1	125 +/- 115	1.8
Day 2	50 +/- 50	2.2
Day 3	117 +/- 141	1.8
Day 4	58 +/- 80	2.1
Day 5	83 +/- 101	1.9
Day 6	<25	>2.5
Day 7	<25	>2.5

Table 10 Test B3: Broccoli, 6˚C, 75% RH

Time	Mean number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 0	7167 +/- 1155	n/a
Day 1	<25	>2.5
Day 2	<25	>2.5
Day 3	<25	>2.5
Day 4	<25	>2.5
Day 5	<25	>2.5
Day 6	50 +/- 25	2.2
Day 7	<25	>2.5

Table 11 Test B4: Broccoli, 6˚C, 50% RH

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 0	7167 +/- 1155	n/a
Day 1	142 +/- 123	1.7
Day 2	<25	>2.5
Day 3	<25	>2.5

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 4	<25	>2.5
Day 5	<25	>2.5
Day 6	<25	>2.3
Day 7	<25	>2.3

Table 12 Test B5: Broccoli, 6˚C, 40% RH

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 0	7167 +/- 1155	n/a
Day 1	358 +/- 52	1.3
Day 2	133 +/- 80	1.7
Day 3	<25	>2.5
Day 4	<25	>2.5
Day 5	<25	>2.5
Day 6	<25	>2.5
Day 7	42 +/- 17	>2.5

Table 13 Test B6: Broccoli, 6˚C, 20% RH

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 0	7167 +/- 1155	n/a
Day 1	125 +/- 87	1.8
Day 2	33 +/- 8	2.3
Day 3	<25	>2.5
Day 4	<25	>2.5
Day 5	<25	>2.5
Day 6	<25	>2.5
Day 7	<25	>2.5

9.1.2.2 Pepper

The results for pepper incubated for up to 7 days with SARS-CoV-2 can be seen in Table 14, Table 15, Table 16, Table 17, Table 18 and Table 19. For all tests, the

means; SEM of the mean and log_{10} reduction of PFU over time are shown. The mean log_{10} decrease (shown to 2 significant figures) compares the PFU recovered at each time point to the PFU recovered at day 0, not to the initial inoculum. All tests were performed in triplicate. The limit of detection for this assay is 25 PFU/sample. Therefore, 2.6 is the maximum log_{10}-reduction detectable with this assay design, equivalent to 25 PFU or fewer infectious virus remaining. Log_{10} decrease was calculated to 2 s.f.

Table 14 Test P1: Pepper, 23˚C, 53% RH

Time	**Mean Number of plaques (PFU/sample) +/- SEM**	**Mean log_{10} decrease from day 0**
Day 0	10167 +/- 2255	n/a
Day 1	<25	>2.6
Day 2	<25	>2.6
Day 3	<25	>2.6
Day 4	<25	>2.6
Day 5	<25	>2.6
Day 6	<25	>2.6
Day 7	<25	>2.6

Table 15 Test P2: Pepper, 23˚C, 31% RH

Time	**Mean Number of plaques (PFU/sample) +/- SEM**	**Mean log_{10} decrease from day 0**
Day 0	10167 +/- 2255	n/a
Day 1	<25	>2.6
Day 2	42 +/- 38	2.4
Day 3	<25	>2.6
Day 4	108 +/- 123	1.9
Day 5	<25	>2.6
Day 6	<25	>2.6
Day 7	<25	>2.6

Table 16 Test P3: Pepper, 6˚C, 75% RH

Time	**Mean number of plaques (PFU/sample) +/- SEM**	**Mean log_{10} decrease from day 0**
Day 0	10167 +/- 2255	n/a
Day 1	3583 +/- 2036	0.45
Day 2	1417 +/- 381	0.85
Day 3	133 +/-133	1.9
Day 4	<25	>2.6
Day 5	<25	>2.6
Day 6	50 +/- 25	2.2
Day 7	<25	>2.6

Table 17 Test P4: Pepper, 6˚C, 50% RH

Time	**Mean Number of plaques (PFU/sample) +/- SEM**	**Mean log_{10} decrease from day 0**
Day 0	10167 +/- 2255	n/a
Day 1	667 +/- 289	1.2
Day 2	83 +/-144	2.1
Day 3	67 +/- 57	2.2
Day 4	58 +/- 33	2.2
Day 5	<25	>2.6
Day 6	<25	>2.6
Day 7	<25	>2.6

Table 18 Test P5: Pepper, 6˚C, 40% RH

Time	**Mean Number of plaques (PFU/sample) +/- SEM**	**Mean log_{10} decrease from day 0**
Day 0	10167 +/- 2255	n/a
Day 1	342 +/- 302	1.5
Day 2	833 +/- 1443	1.1
Day 3	341 +/- 224	1.5
Day 4	250 +/- 433	1.6
Day 5	192 +/- 128	1.7
Day 6	<25	>2.6

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 7	58 +/- 14	2.2

Table 19 Test P6: Pepper, 6˚C, 20% RH

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 0	10167 +/- 2255	n/a
Day 1	<25	>2.6
Day 2	<25	>2.6
Day 3	<25	>2.6
Day 4	<25	>2.6
Day 5	<25	>2.6
Day 6	<25	>2.6
Day 7	<25	>2.6

9.1.3 Fresh fruit

9.1.3.1 Apple

The results for apple incubated for up to 7 days with SARS-CoV-2 can be seen in Table 20, Table 21, Table 22, Table 23, Table 24 and Table 25. For all tests, the means; SEM of the mean and log_{10} reduction of PFU over time are shown. The mean log_{10} decrease (shown to 2 significant figures) compares the PFU recovered at each time point to the PFU recovered at day 0, not to the initial inoculum. All tests were performed in triplicate. The limit of detection for this assay is 25 PFU/sample. Therefore, 1.6 is the maximum log_{10}-reduction detectable with this assay design, equivalent to 25 PFU or fewer infectious virus remaining. Log_{10} decrease was calculated to 2 s.f.

Table 20 Test A1: Apple, 23˚C, 80% RH

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 0	917 +/- 314	n/a
Day 1	<25	>1.6
Day 2	<25	>1.6
Day 3	<25	>1.6

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 4	<25	>1.6
Day 5	<25	>1.6
Day 6	<25	>1.6
Day 7	<25	>1.6

Table 21 Test A2: Apple, 23˚C, 53% RH

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 0	917 +/- 314	n/a
Day 1	138 +/- 68	0.82
Day 2	<25	>1.6
Day 3	<25	>1.6
Day 4	<25	>1.6
Day 5	<25	>1.6
Day 6	<25	>1.6
Day 7	<25	>1.6

Table 22 Test A3: Broccoli, 23˚C, 20% RH

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 0	917 +/- 314	n/a
Day 1	<25	>1.6
Day 2	<25	>1.6
Day 3	<25	>1.6
Day 4	<25	>1.6
Day 5	<25	>1.6
Day 6	<25	>1.6
Day 7	<25	>1.6

Table 23 Test A4: Apple, 6˚C, 75% RH

Time	Mean number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 0	917 +/- 314	n/a

Time	**Mean number of plaques (PFU/sample) +/- SEM**	**Mean log_{10} decrease from day 0**
Day 1	221+/- 105	0.62
Day 2	83 +/- 49	1.04
Day 3	<25	>1.6
Day 4	<25	>1.6
Day 5	<25	>1.6
Day 6	<25	>1.6
Day 7	<25	>1.6

Table 24 Test A5: Apple, 6˚C, 50% RH

Time	**Mean Number of plaques (PFU/sample) +/- SEM**	**Mean log_{10} decrease from day 0**
Day 0	917 +/- 314	n/a
Day 1	58 +/- 21	1.2
Day 2	79 +/- 37	1.1
Day 3	54 +/- 29	1.3
Day 4	<25	>1.6
Day 5	<25	>1.6
Day 6	<25	>1.6
Day 7	<25	>1.6

Table 25 Test A6: Apple, 6˚C, 40% RH

Time	**Mean Number of plaques (PFU/sample) +/- SEM**	**Mean log_{10} decrease from day 0**
Day 0	917 +/- 314	n/a
Day 1	92 +/- 44	0.99
Day 2	408 +/- 175	0.35
Day 3	<25	>1.6
Day 4	<25	>1.6
Day 5	<25	>1.6
Day 6	<25	>1.6
Day 7	<25	>1.6

9.1.3.2 Raspberry

The results for raspberry incubated for up to 7 days with SARS-CoV-2 can be seen in Table 26, Table 27, Table 28, Table 29, Table 30 and Table 31. For all tests, the means; SEM of the mean and log_{10} reduction of PFU over time are shown. The mean log_{10} decrease (shown to 2 significant figures) compares the PFU recovered at each time point to the PFU recovered at day 0, not to the initial inoculum. All tests were performed in triplicate. The limit of detection for this assay is 25 PFU/sample. Therefore, 2.5 is the maximum log_{10}-reduction detectable with this assay design, equivalent to 25 PFU or fewer infectious virus remaining. Log_{10} decrease was calculated to 2 s.f.

Table 26 Test R1: Raspberry, 23˚C, 50% RH

Time	**Mean Number of plaques (PFU/sample) +/- SEM**	**Mean log_{10} decrease from day 0**
Day 0	7833 +/- 1527	n/a
Day 1	<25	>2.5
Day 2	<25	>2.5
Day 3	<25	>2.5
Day 4	<25	>2.5
Day 5	<25	>2.5
Day 6	<25	>2.5
Day 7	<25	>2.5

Table 27 Test R2: Raspberry, 6˚C, 80% RH

Time	**Mean Number of plaques (PFU/sample) +/- SEM**	**Mean log_{10} decrease from day 0**
Day 0	7833 +/- 1527	n/a
Day 1	<25	>2.5
Day 2	121 +/- 96	1.8
Day 3	33 +/- 8	>2.5
Day 4	<25	>2.5
Day 5	<25	>2.5
Day 6	<25	>2.5

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 7	<25	>2.5

Table 28 Test R3: Raspberry, 6˚C, 75% RH

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 0	7833 +/- 1527	n/a
Day 1	<25	>2.5
Day 2	<25	>2.5
Day 3	79 +/- 43	2.1
Day 4	<25	>2.5
Day 5	<25	>2.5
Day 6	<25	>2.5
Day 7	<25	>2.5

Table 29 Test R4: Raspberry, 6˚C, 50% RH

Time	Mean number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 0	7833 +/- 1527	n/a
Day 1	267 +/- 242	1.5
Day 2	<25	>2.5
Day 3	<25	>2.5
Day 4	<25	>2.5
Day 5	<25	>2.5
Day 6	<25	>2.5
Day 7	<25	>2.5

Table 30 Test R5: Raspberry, 6˚C, 40% RH

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 0	7833 +/- 1527	n/a
Day 1	<25	>2.5
Day 2	158 +/- 68	1.7
Day 3	113 +/- 88	1.8

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 4	<25	>2.5
Day 5	<25	>2.5
Day 6	<25	>2.5
Day 7	<25	>2.5

Table 31 Test R6: Raspberry, 6˚C, 20% RH

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 0	7833 +/- 1527	n/a
Day 1	46 +/- 21	2.2
Day 2	<25	>2.5
Day 3	33 +/- 8	>2.5
Day 4	<25	>2.5
Day 5	63 +/- 38	2.1
Day 6	<25	>2.5
Day 7	<25	>2.5

9.1.4 Baked products and pastries

9.1.4.1 White bread crust

The results for white bread crust incubated for up to 7 days with SARS-CoV-2 can be seen in Table 32, Table 33, Table *34* and Table *35*. For all tests, the means; SEM of the mean and log_{10} reduction of PFU over time are shown. The mean log_{10} decrease (shown to 2 significant figures) compares the PFU recovered at each time point to the PFU recovered at day 0, not to the initial inoculum. All tests were performed in triplicate. The limit of detection for this assay is 25 PFU/sample. Therefore, 2.2 is the maximum log_{10}-reduction detectable with this assay design, equivalent to 25 PFU or fewer infectious virus remaining. Log_{10} decrease was calculated to 2 s.f.

Table 32 Test Wb1: White bread, 23˚C, 80% RH

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 0	3583 +/- 804	n/a
Day 1	37.5 +/- 22	2.0
Day 2	<25	>2.2
Day 3	<25	>2.2
Day 4	<25	>2.2
Day 5	<25	>2.2

Table 33 Test Wb2: White bread, 23˚C, 57% RH

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 0	3583 +/- 804	n/a
Day 1	208 +/- 29	1.2
Day 2	<25	>2.2
Day 3	<25	>2.2
Day 4	<25	>2.2
Day 5	<25	>2.2
Day 6	<25	>2.2
Day 7	<25	>2.2

Table 34 Test Wb3: White bread, 23˚C, 50% RH

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 0	3583 +/- 804	n/a
Day 1	271 +/- 280	1.1
Day 2	138 +/- 154	1.4
Day 3	<25	>2.2
Day 4	<25	>2.2
Day 5	<25	>2.2
Day 6	<25	>2.2
Day 7	<25	>2.2

Table 35 Test Wb4: White bread, 23˚C, 20% RH

Time	**Mean number of plaques (PFU/sample) +/- SEM**	**Mean log_{10} decrease from day 0**
Day 0	3583 +/- 804	n/a
Day 1	275 +/-303	1.1
Day 2	167 +/-194	1.3
Day 3	117 +/-101	1.5
Day 4	<25	>2.2
Day 5	<25	>2.2

9.1.4.2 Brown bread crust

The results for brown bread crust incubated for up to 7 days with SARS-CoV-2 can be seen in, Table *36* Table 37, Table 38 and Table 39. For all tests, the means; SEM of the mean and log_{10} reduction of PFU over time are shown. The mean log_{10} decrease (shown to 2 significant figures) compares the PFU recovered at each time point to the PFU recovered at day 0, not to the initial inoculum. All tests were performed in triplicate. The limit of detection for this assay is 25 PFU/sample. Therefore, 2.2 is the maximum log_{10}-reduction detectable with this assay design, equivalent to 25 PFU or fewer infectious virus remaining. Log_{10} decrease was calculated to 2 s.f.

Table 36 Test Bb1: Brown bread, 23˚C, 80% RH

Time	**Mean Number of plaques (PFU/sample) +/- SEM**	**Mean log_{10} decrease from day 0**
Day 0	3667 +/- 1627	n/a
Day 1	379 +/- 221	0.99
Day 2	<25	>2.2
Day 3	<25	>2.2
Day 4	<25	>2.2
Day 5	<25	>2.2

Table 37 Test Bb2: Brown bread, 23˚C, 57% RH

Time	**Mean Number of plaques (PFU/sample) +/- SEM**	**Mean log_{10} decrease from day 0**
Day 0	3667 +/- 1627	n/a

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 1	<25	>2.2
Day 2	<25	>2.2
Day 3	<25	>2.2
Day 4	<25	>2.2
Day 5	<25	>2.2
Day 6	<25	>2.2
Day 7	<25	>2.2

Table 38 Test Bb3: Brown bread, 23˚C, 50% RH

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 0	3667 +/- 1627	n/a
Day 1	42 +/- 29	1.9
Day 2	<25	>2.2
Day 3	<25	>2.2
Day 4	<25	>2.2
Day 5	<25	>2.2
Day 6	<25	>2.2
Day 7	<25	>2.2

Table 39 Test Bb4: Brown bread, 23˚C, 20% RH

Time	Mean number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 0	3667 +/- 1627	n/a
Day 1	129 +/- 106	1.5
Day 2	83 +/- 102	1.6
Day 3	12 5 +/-121	1.5
Day 4	<25	>2.2
Day 5	<25	>2.2

9.1.4.3 Croissant

The results for croissant incubated for up to 7 days with SARS-CoV-2 can be seen in Table 40, Table 41, Table 42, Table 43, Table 44, Table 45, Table 46 and Table 47. For all tests, the means; SEM of the mean and log_{10} reduction of PFU over time are shown. The mean log_{10} decrease (shown to 2 significant figures) compares the PFU recovered at each time point to the PFU recovered at day 0, not to the initial inoculum. All tests were performed in triplicate. The limit of detection for this assay is 25 PFU/sample. Therefore, 2.4 is the maximum log_{10}-reduction detectable with this assay design, equivalent to 25 PFU or fewer infectious virus remaining. Log_{10} decrease was calculated to 2 s.f.

Table 40 Test Cr1: Croissant, 23˚C, 80% RH

Time	**Mean Number of plaques (PFU/sample) +/- SEM**	**Mean log_{10} decrease from day 0**
Day 0	6500 +/- 661	n/a
Day 1	<25	>2.4
Day 2	<25	>2.4
Day 3	<25	>2.4
Day 4	<25	>2.4
Day 5	<25	>2.4

Table 41 Test Cr2: Croissant, 23˚C, 57% RH

Time	**Mean Number of plaques (PFU/sample) +/- SEM**	**Mean log_{10} decrease from day 0**
Day 0	6500 +/- 661	n/a
Day 1	<25	>2.4
Day 2	<25	>2.4
Day 3	<25	>2.4
Day 4	<25	>2.4
Day 5	<25	>2.4
Day 6	<25	>2.4
Day 7	<25	>2.4

Table 42 Test Cr3: Croissant, 23˚C, 50% RH

Time	**Mean Number of plaques (PFU/sample) +/- SEM**	**Mean log_{10} decrease from day 0**
Day 0	6500 +/- 661	n/a
Day 1	<25	>2.4
Day 2	<25	>2.4
Day 3	<25	>2.4
Day 4	<25	>2.4
Day 5	<25	>2.4
Day 6	<25	>2.4
Day 7	<25	>2.4

Table 43 Test Cr4: Croissant, 23˚C, 20% RH

Time	**Mean number of plaques (PFU/sample) +/- SEM**	**Mean log_{10} decrease from day 0**
Day 0	6500 +/- 661	n/a
Day 1	<25	>2.4
Day 2	<25	>2.4
Day 3	<25	>2.4
Day 4	<25	>2.4
Day 5	<25	>2.4

Table 44 Test Cr5: Croissant, 23˚C, 80% RH

Time	**Mean Number of plaques (PFU/sample) +/- SEM**	**Mean log_{10} decrease from day 0**
0 hours	6500 +/- 661	n/a
2 hours	492 +/- 321	1.1
4 hours	120 +/- 95	1.7
6 hours	<25	>2.4
16 hours	<25	>2.4
24 hours	<25	>2.4

Table 45 Test Cr6: Croissant, 23˚C, 57% RH

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
0 hours	6500 +/- 661	n/a
2 hours	797 +/- 600	0.91
4 hours	378 +/-600	1.2
6 hours	214 +/- 141	1.5
16 hours	<25	>2.4
24 hours	<25	>2.4

Table 46 Test Cr7: Croissant, 23˚C, 50% RH

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
0 hours	6500 +/- 661	n/a
2 hours	2203 +/- 624	0.47
4 hours	400 +/- 174	1.2
6 hours	387 +/-295	1.2
16 hours	255 +/-25	1.4
24 hours	<25	>2.4

Table 47 Test Cr8: Croissant, 23˚C, 20% RH

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
0 hours	6500 +/- 661	n/a
2 hours	453 +/- 251	1.2
4 hours	191 +/- 148	1.5
6 hours	182 +/- 166	1.6
16 hours	<25	>2.4
24 hours	<25	>2.4

9.1.4.4 Pain au chocolat

The results for pain au chocolat incubated for up to 7 days with SARS-CoV-2 can be seen in Table 48, Table 49, Table 50, Table 51, Table 52, Table 53, Table 54 and

Table 55. For all tests, the means; SEM of the mean and log_{10} reduction of PFU over time are shown. The mean log_{10} decrease (shown to 2 significant figures) compares the PFU recovered at each time point to the PFU recovered at day 0, not to the initial inoculum. All tests were performed in triplicate. The limit of detection for this assay is 25 PFU/sample. Therefore, 2.2 is the maximum log_{10}-reduction detectable with this assay design, equivalent to 25 PFU or fewer infectious virus remaining. Log_{10} decrease calculated to 2 s.f.

Table 48 Test Pc1: Pain au chocolat, 23˚C, 80% RH

Time	**Mean Number of plaques (PFU/sample) +/- SEM**	**Mean log_{10} decrease from day 0**
Day 0	3583 +/- 382	n/a
Day 1	<25	>2.2
Day 2	<25	>2.2
Day 3	<25	>2.2
Day 4	<25	>2.2
Day 5	<25	>2.2

Table 49 Test Pc2: Pain au chocolat, 23˚C, 57% RH

Time	**Mean Number of plaques (PFU/sample) +/- SEM**	**Mean log_{10} decrease from day 0**
Day 0	3583 +/- 382	n/a
Day 1	<25	>2.2
Day 2	<25	>2.2
Day 3	<25	>2.2
Day 4	<25	>2.2
Day 5	<25	>2.2
Day 6	<25	>2.2
Day 7	<25	>2.2

Table 50 Test Pc3: Pain au chocolat, 23˚C, 50% RH

Time	**Mean Number of plaques (PFU/sample) +/- SEM**	**Mean log_{10} decrease from day 0**
Day 0	3583 +/- 382	n/a
Day 1	<25	>2.2

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 2	33 +/- 10	2.0
Day 3	<25	>2.2
Day 4	<25	>2.2
Day 5	<25	>2.2
Day 6	<25	>2.2
Day 7	<25	>2.2

Table 51 Test Pc4: Pain au chocolat, 23˚C, 20% RH

Time	Mean number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 0	3583 +/- 382	n/a
Day 1	<25	>2.2
Day 2	<25	>2.2
Day 3	<25	>2.2
Day 4	<25	>2.2
Day 5	<25	>2.2

Table 52 Test Pc5: Pain au chocolat, 23˚C, 80% RH

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
0 hours	3583 +/- 382	n/a
2 hours	935 +/- 713	0.58
4 hours	1061 +/- 441	0.53
6 hours	74 +/- 24	1.7
16 hours	<25	>2.2
24 hours	<25	>2.2

Table 53 Test Pc6: Pain au chocolat, 23˚C, 57% RH

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
0 hours	3583 +/- 382	n/a
2 hours	1450 +/- 1567	0.39
4 hours	705 +/- 253	0.71

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
6 hours	42 +/- 14	1.9
16 hours	<25	>2.2
24 hours	<25	>2.2

Table 54 Test Pc7: Pain au chocolat, 23˚C, 50% RH

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
0 hours	3583 +/- 382	n/a
2 hours	1427 +/- 23	0.40
4 hours	255 +/- 169	1.2
6 hours	93 +/- 23	1.6
16 hours	60 +/- 30	1.8
24 hours	<25	>2.2

Table 55 Test Pc8: Pain au chocolat, 23˚C, 20% RH

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
0 hours	3583 +/- 382	n/a
2 hours	499 +/- 439	0.86
4 hours	191 +/- 23	1.3
6 hours	<25	>2.2
16 hours	<25	>2.2
24 hours	<25	>2.2

9.1.5 Delicatessen items

9.1.5.1 Sliced Ham

The results for ham incubated for up to 7 days with SARS-CoV-2 can be seen in Table 56, Table 57, Table 58 and Table 59. For all tests, the means; SEM of the mean and log_{10} reduction of PFU over time are shown. The mean log_{10} decrease (shown to 2 significant figures) compares the PFU recovered at each time point to the PFU recovered at day 0, not to the initial inoculum. All tests were performed in triplicate. The limit of detection for this assay is 25 PFU/sample. Therefore, 2.4 is the

maximum log_{10}-reduction detectable with this assay design, equivalent to 25 PFU or fewer infectious virus remaining. Log_{10} decrease was calculated to 2 s.f.

Table 56 Test H1: Ham, 6˚C, 74% RH

Time	**Mean Number of plaques (PFU/sample) +/- SEM**	**Mean log_{10} decrease from day 0**
Day 0	4000 +/- 1607	n/a
Day 1	1240 +/- 266	0.51
Day 2	667 +/- 131	0.78
Day 3	840 +/- 295	0.68
Day 4	467 +/- 48	0.93
Day 5	640 +/- 106	0.80
Day 6	267 +/- 74	1.2
Day 7	480 +/- 101	0.92

Table 57 Test H2: Ham, 6˚C, 60% RH

Time	**Mean Number of plaques (PFU/sample) +/- SEM**	**Mean log_{10} decrease from day 0**
Day 0	4000 +/- 1607	n/a
Day 1	1950 +/- 304	0.31
Day 2	1233 +/- 67	0.51
Day 3	1333 +/- 44	0.48
Day 4	950 +/- 153	0.62
Day 5	700 +/- 76	0.76
Day 6	267 +/- 93	1.2
Day 7	383 +/- 130	1.0

Table 58 Test H3: Ham, 6˚C, 50% RH

Time	**Mean Number of plaques (PFU/sample) +/- SEM**	**Mean log_{10} decrease from day 0**
Day 0	4000 +/- 1607	n/a
Day 1	1467 +/- 176	0.44
Day 2	1367 +/- 120	0.47
Day 3	1600 +/- 100	0.40
Day 4	3533 +/- 240	0.054

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 5	2467 +/- 521	0.21
Day 6	667 +/- 291	0.78
Day 7	508 +/- 243	0.90

Table 59 Test H4: Ham, 6˚C, 20% RH

Time	Mean number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 0	4000 +/- 1607	n/a
Day 1	3917 +/- 83	0.0091
Day 2	1700 +/- 436	0.37
Day 3	1567 +/- 410	0.41
Day 4	1500 +/- 300	0.43
Day 5	1033 +/- 88	0.59
Day 6	2033 +/- 174	0.29
Day 7	1383 +/- 268	0.46

9.1.5.2 Cheddar cheese

The results for cheddar cheese incubated for up to 7 days with SARS-CoV-2 can be seen in Table 60, Table 61, Table 62 and Table 63. For all tests, the means; SEM of the mean and log_{10} reduction of PFU over time are shown. The mean log_{10} decrease (shown to 2 significant figures) compares the PFU recovered at each time point to the PFU recovered at day 0, not to the initial inoculum. All tests were performed in triplicate. The limit of detection for this assay is 25 PFU/sample. Therefore, 2.4 is the maximum log_{10}-reduction detectable with this assay design, equivalent to 25 PFU or fewer infectious virus remaining. Log_{10} decrease was calculated to 2 s.f.

Table 60 Test Ch1: Cheese, 6˚C, 74% RH

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 0	6083 +/- 1416	n/a
Day 1	1053 +/- 114	0.76
Day 2	973 +/- 139	0.80

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 3	840 +/- 260	0.86
Day 4	400 +/- 23	1.2
Day 5	453 +/- 48	1.1
Day 6	307 +/- 74	1.3
Day 7	533 +/- 87	1.1

Table 61 Test Ch2: Cheese, 6˚C, 60% RH

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 0	6083 +/- 1416	n/a
Day 1	1750 +/- 397	0.54
Day 2	1133 +/- 83	0.73
Day 3	1267 +/- 109	0.68
Day 4	892 +/- 74	0.83
Day 5	733 +/- 88	0.91
Day 6	666 +/- 145	0.96
Day 7	600 +/- 173	1.0

Table 62 Test Ch3: Cheese, 6˚C, 50% RH

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 0	6083 +/- 1416	n/a
Day 1	2000 +/- 200	0.48
Day 2	1767 +/- 260	0.54
Day 3	1800 +/- 346	0.53
Day 4	1800 +/- 493	0.53
Day 5	1767 +/- 491	0.53
Day 6	467 +/- 67	1.1
Day 7	967 +/- 426	0.8

Table 63 Test Ch4: Cheese, 6˚C, 20% RH

Time	Mean number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 0	6083 +/- 1416	n/a
Day 1	3533 +/- 145	0.24
Day 2	2033 +/- 186	0.48
Day 3	1433 +/- 318	0.63
Day 4	1733 +/- 291	0.55
Day 5	1567 +/- 273	0.59
Day 6	1017 +/- 93	0.78
Day 7	1933 +/- 203	0.5

9.1.5.3 Olive

The results for olive incubated for up to 96 hours with SARS-CoV-2 can be seen in Table 64. For all tests, the means; SEM of the mean and log_{10} reduction of PFU over time are shown. The mean log_{10} decrease (shown to 2 significant figures) compares the PFU recovered at each time point to the PFU recovered at day 0, not to the initial inoculum. All tests were performed in triplicate. The limit of detection for this assay is 25 PFU/sample. Therefore, 2.6 is the maximum log_{10}-reduction detectable with this assay design, equivalent to 25 PFU or fewer infectious virus remaining. Log_{10} decrease was calculated to 2 s.f.

Table 64 Test O1: Olive, 6˚C, 60% RH

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
0 minutes	10250	n/a
1 minute	545 +/- 274	1.3
15 minutes	567 +/- 69	1.3
30 minutes	490 +/- 176	1.3
60 minutes	207 +/- 37	1.7
24 hours	<25	>2.6
48 hours	<25	>2.6
96 hours	<25	>2.6

9.1.5.4 Brine

The results for brine incubated for up to 7 days with SARS-CoV-2 can be seen in Table 65, Table 66, Table 67 and Table 68. For all tests, the means; SEM of the mean and log_{10} reduction of PFU over time are shown. The mean log_{10} decrease (shown to 2 significant figures) compares the PFU recovered at each time point to the PFU recovered at day 0, not to the initial inoculum. All tests were performed in triplicate. The limit of detection for this assay is 25 PFU/sample. Therefore, 1.9 is the maximum log_{10}-reduction detectable with this assay design, equivalent to 25 PFU or fewer infectious virus remaining. Log_{10} decrease was calculated to 2 s.f.

Table 65 Test BR1: Brine, 6˚C, 74% RH

Time	**Mean Number of plaques (PFU/sample) +/- SEM**	**Mean log_{10} decrease from day 0**
Day 0	2083 +/- 682	n/a
Day 1	303 +/- 58	0.84
Day 2	71 +/- 22	1.47
Day 3	<25	>1.9
Day 4	<25	>1.9
Day 5	<25	>1.9
Day 6	<25	>1.9
Day 7	<25	>1.9

Table 66 Test BR2: Brine, 6˚C, 60% RH

Time	**Mean Number of plaques (PFU/sample) +/- SEM**	**Mean log_{10} decrease from day 0**
Day 0	2083 +/- 682	n/a
Day 1	430 +/- 58	0.69
Day 2	92 +/ -22	1.4
Day 3	98 +/- 38	1.3
Day 4	50 +/- 25	1.6
Day 5	<25	>1.9
Day 6	<25	>1.9
Day 7	<25	>1.9

Table 67 Test BR3: Brine, 6˚C, 50% RH

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 0	2083 +/- 682	n/a
Day 1	346 +/- 165	0.78
Day 2	<25	>1.9
Day 3	<25	>1.9
Day 4	<25	>1.9
Day 5	<25	>1.9
Day 6	<25	>1.9
Day 7	<25	>1.9

Table 68 Test BR4: Brine, 6˚C, 20% RH

Time	Mean number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 0	2083 +/- 682	n/a
Day 1	383 +/- 42	0.74
Day 2	102 +/- 36	1.3
Day 3	87 +/- 36	1.4
Day 4	<25	1.9

9.2 SARS-CoV-2 survival on food packaging materials

9.2.1 Baseline parameters all food packaging materials

Baseline parameters for all food packaging tests were determined and are shown in Table 69, Table 70 and Table 71.

Table 69 Effect of packaging sample extracts without virus on Vero E6 cells.

Packaging sample	Observable CPE %
PET1 bottle no virus	0
PET1 tray no virus	0
Aluminium can no virus	0
Composite drinks carton	0

Table 70 Effect of packaging sample extracts on SARS-CoV-2

Packaging sample	Mean titre recovered (PFU/sample)	Mean % recovery
Infection Medium + SARS-CoV-2	10250	100
PET1 bottle + SARS-CoV-2	9900	96.5
PET1 tray + SARS-CoV-2	10000	97.5
Aluminium can + SARS-CoV-2	9250	90
Composite drinks carton + SARS-CoV-2	9333	91

All tests were performed in triplicate, with 10250 PFU added to each sample.

Table 71 Recovery of artificially contaminated SARS-CoV-2 from food packaging in the presence or absence of 0.1% mucin

Packaging sample	Mean Number of plaques (PFU/sample)	Mean % Recovery
PET1 bottle + SARS-CoV-2	7050 +/- 1826	69
PET bottle + SARS-CoV-2 + mucin	6667 +/- 1121	65
PET1 tray + SARS-CoV-2	4583 +/- 682	45
Aluminium can + SARS-CoV-2	6167 +/- 1258	60
Aluminium can + SARS-CoV-2 + mucin	5542 +/- 494	54
Composite drinks carton + SARS-CoV-2	7333 +/- 882	71.5
Composite drinks carton + SARS-CoV-2 + mucin	6000 +/- 764	58.5

All tests were performed in triplicate, with 10250 PFU added to each sample

9.2.2 **Packaging materials**

9.2.2.1 PET1 Plastic bottles

The results for PET1 bottles incubated without mucin for up to 7 days with SARS-CoV-2 can be seen in Table 72, Table 73, Table 74, Table 75, Table 76 and Table 77. For all tests, the means; SEM of the mean and log_{10} reduction of PFU over time are shown. The mean log_{10} decrease (shown to 2 significant figures) compares the PFU recovered at each time point to the PFU recovered at day 0, not to the initial inoculum. All tests were performed in triplicate. The limit of detection for this assay is 25 PFU/sample. Therefore, 2.5 is the maximum log_{10}-reduction detectable with this

assay design, equivalent to 25 PFU or fewer infectious virus remaining. Log_{10} decrease was calculated to 2 s.f.

Table 72 Test PB1: PET1 bottle, 21˚C, 80% RH

Time	**Mean number of plaques (PFU/sample) +/- SEM**	**Mean log_{10} decrease from day 0**
Day 0	7050 +/- 1826	n/a
Day 1	<25	>2.5
Day 2	<25	>2.5
Day 3	<25	>2.5
Day 4	<25	>2.5
Day 5	<25	>2.5
Day 6	<25	>2.5
Day 7	<25	>2.5

Table 73 Test PB2: PET1 bottle, 21˚C, 53% RH

Time	**Mean Number of plaques (PFU/sample) +/- SEM**	**Mean log_{10} decrease from day 0**
Day 0	7050 +/- 1826	n/a
Day 1	4250 +/- 350	0.23
Day 2	467 +/- 257	1.19
Day 3	<25	>2.5
Day 4	<25	>2.5
Day 5	<25	>2.5
Day 6	<25	>2.5
Day 7	50 +/- 25	2.1

Table 74 Test PB3: PET1 bottle, 21˚C, 20% RH

Time	**Mean Number of plaques (PFU/sample) +/- SEM**	**Mean log_{10} decrease from day 0**
Day 0	7050 +/- 1826	n/a
Day 1	<25	>2.5
Day 2	<25	>2.5
Day 3	<25	>2.5
Day 4	<25	>2.5

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 5	<25	>2.5
Day 6	<25	>2.5
Day 7	<25	>2.5

Table 75 Test PB4: PET1 bottle, 6˚C, 80% RH

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 0	7050 +/- 1826	n/a
Day 1	2508 +/- 2278	0.45
Day 2	117 +/- 159	1.8
Day 3	108 +- 88	1.8
Day 4	158 +/- 29	1.6
Day 5	<25	>2.5
Day 6	<25	>2.5
Day 7	<25	>2.5

Table 76 Test PB5: PET1 bottle, 6˚C, 40% RH

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 0	7050 +/- 1826	n/a
Day 1	1478 +/- 971	0.68
Day 2	80 +/- 95	1.96
Day 3	111 +/- 150	1.8
Day 4	181 +/- 175	1.6
Day 5	<25	>2.5
Day 6	<25	>2.5
Day 7	82 +/- 35	1.9

Table 77 Test PB6: PET1 bottle, 6˚C, 20% RH

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 0	7050 +/- 1826	n/a
Day 1	1217 +/- 58	0.76

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 2	1183 +/- 1141	0.78
Day 3	50 +/- 0	2.1
Day 4	75 /- 66	2.0
Day 5	95 +/- 73	1.9
Day 6	365 +/- 279	1.3
Day 7	<25	>2.5

9.2.2.2 PET1 Plastic bottles with added mucin

The results for PET1 bottles incubated with added mucin for up to 7 days with SARS-CoV-2 can be seen in Table 78, Table 79, Table 80, Table *81*, Table 82 and Table 83. For all tests, the means; SEM of the mean and log_{10} reduction of PFU over time are shown. The mean log_{10} decrease (shown to 2 significant figures) compares the PFU recovered at each time point to the PFU recovered at day 0, not to the initial inoculum. All tests were performed in triplicate. The limit of detection for this assay is 25 PFU/sample. Therefore, 2.4 is the maximum log_{10}-reduction detectable with this assay design, equivalent to 25 PFU or fewer infectious virus remaining. Log_{10} decrease was calculated to 2 s.f.

Table 78 Test PB1M: PET1 bottle, mucin, 21˚C, 80% RH

Time	Mean number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 0	6667 +/- 1121	n/a
Day 1	327 +/- 99	1.3
Day 2	<25	>2.4
Day 3	<25	>2.4
Day 4	<25	>2.4

Table 79 Test PB2M: PET1 bottle, mucin, 21˚C, 53% RH

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 0	6667 +/- 1121	n/a
Day 1	83 +/- 8	1.9

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 2	<25	>2.4
Day 3	<25	>2.4
Day 4	<25	>2.4
Day 5	<25	>2.4
Day 6	<25	>2.4
Day 7	<25	>2.4

Table 80 Test PB3M: PET1 bottle, mucin, 21˚C, 20% RH

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 0	6667 +/- 1121	n/a
Day 1	133 +/-60	1.7
Day 2	<25	>2.4
Day 3	<25	>2.4
Day 4	<25	>2.4

Table 81 Test PB4M: PET1 bottle, mucin, 6˚C, 80% RH

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 0	6667 +/- 1121	n/a
Day 1	1430 +/- 334	0.67
Day 2	87 +/- 62	1.9
Day 3	178 +/- 77	1.6
Day 4	<25	>2.4

Table 82 Test PB5M: PET1 bottle, mucin, 6˚C, 40% RH

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 0	6667 +/- 1121	n/a
Day 1	175 +/- 120	1.6
Day 2	<25	>2.4
Day 3	<25	>2.4
Day 4	<25	>2.4

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 5	<25	>2.4
Day 6	<25	>2.4
Day 7	<25	>2.4

Table 83 Test PB6M: PET1 bottle, mucin, 6˚C, 20% RH

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 0	6667 +/- 1121	n/a
Day 1	1026 +/- 204	0.81
Day 2	725 +/- 98	0.96
Day 3	<25	>2.4
Day 4	<25	>2.4

9.2.2.3 PET1 Trays

The results for PET1 trays incubated for up to 7 days with SARS-CoV-2 can be seen in Table 85, Table 86, Table 87, Table 88 and Table 89. For all tests, the means; SEM of the mean and log_{10} reduction of PFU over time are shown. The mean log_{10} decrease (shown to 2 significant figures) compares the PFU recovered at each time point to the PFU recovered at day 0, not to the initial inoculum. All tests were performed in triplicate. The limit of detection for this assay is 25 PFU/sample. Therefore, 2.3 is the maximum log_{10}-reduction detectable with this assay design, equivalent to 25 PFU or fewer infectious virus remaining. Log_{10} decrease was calculated to 2 s.f.

Table 84 Test PT1: PET1 tray, 21°C, 80% RH

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 0	4583 +/- 682	n/a
Day 1	<25	>2.3
Day 2	<25	>2.3
Day 3	<25	>2.3
Day 4	<25	>2.3

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 5	<25	>2.3
Day 6	<25	>2.3
Day 7	<25	>2.3

Table 85 Test PT2: PET1 tray, 21˚C, 53% RH

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 0	4583 +/- 682	n/a
Day 1	2583 +/- 1010	0.25
Day 2	1375 +/- 125	0.52
Day 3	1417 +/- 722	0.51
Day 4	575 +/- 588	0.90
Day 5	<25	>2.3
Day 6	<25	>2.3
Day 7	<25	>2.3

Table 86 Test PT3: PET1 tray, 21˚C, 20% RH

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 0	4583 +/- 682	n/a
Day 1	<25	>2.3
Day 2	<25	>2.3
Day 3	<25	>2.3
Day 4	<25	>2.3
Day 5	<25	>2.3
Day 6	<25	>2.3
Day 7	<25	>2.3

Table 87 Test PT4: PET1 tray, 6˚C, 80% RH

Time	Mean number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 0	4583 +/- 682	n/a
Day 1	5250 +/- 1750	-0.06

Time	Mean number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 2	750 +/- 901	0.79
Day 3	242 +/- 38	1.3
Day 4	158 +/- 63	1.5
Day 5	<25	>2.3
Day 6	<25	>2.3
Day 7	<25	>2.3

Table 88 Test PT5: PET1 tray, 6˚C, 40% RH

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 0	4583 +/- 682	n/a
Day 1	1667 +/- 629	0.44
Day 2	1300 +/- 87	0.55
Day 3	117 +/- 95	1.6
Day 4	808 +/- 664	0.75
Day 5	342 +/- 485	1.1
Day 6	<25	>2.3
Day 7	<25	>2.3

Table 89 Test PT6: PET1 tray, 6˚C, 20% RH

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 0	4583 +/- 682	n/a
Day 1	2433 +/- 1436	0.28
Day 2	1142 +/- 500	0.6
Day 3	58 +/- 58	1.9
Day 4	142 +/- 101	1.5
Day 5	175 +/- 5	1.4
Day 6	450 +/- 132	1.0
Day 7	<25	>2.3

9.2.2.4 Aluminium cans

The results for aluminium cans incubated without mucin for up to 7 days with SARS-CoV-2 can be seen in Table 90, Table 91, Table 92, Table 93, Table 94, Table 95 and Table 96. For all tests, the means; SEM of the mean and log_{10} reduction of PFU over time are shown. The mean log_{10} decrease (shown to 2 significant figures) compares the PFU recovered at each time point to the PFU recovered at day 0, not to the initial inoculum. All tests were performed in triplicate. The limit of detection for this assay is 25 PFU/sample. Therefore, 2.4 is the maximum log_{10}-reduction detectable with this assay design, equivalent to 25 PFU or fewer infectious virus remaining. Log_{10} decrease was calculated to 2 s.f.

Table 90 Test AL1: Aluminium can, 21˚C, 80% RH

Time	**Mean Number of plaques (PFU/sample) +/- SEM**	**Mean log_{10} decrease from day 0**
Day 0	6167+/- 1258	n/a
Day 1	<25	>2.4
Day 2	<25	>2.4
Day 3	<25	>2.4
Day 4	<25	>2.4

Table 91 Test AL2: Aluminium can, 21˚C, 53% RH

Time	**Mean Number of plaques (PFU/sample) +/- SEM**	**Mean log_{10} decrease from day 0**
Day 0	6167+/- 1258	n/a
Day 1	<25	>2.4
Day 2	<25	>2.4
Day 3	<25	>2.4
Day 4	<25	>2.4
Day 5	<25	>2.4
Day 6	<25	>2.4
Day 7	<25	>2.4

Table 92 Test AL3: Aluminium can, 21˚C, 20% RH

Time	**Mean Number of plaques (PFU/sample) +/- SEM**	**Mean log_{10} decrease from day 0**
Day 0	6167+/- 1258	n/a
Day 1	<25	>2.4
Day 2	<25	>2.4
Day 3	<25	>2.4
Day 4	<25	>2.4

Table 93 Test AL4: Aluminium can, 6˚C, 80% RH

Time	**Mean Number of plaques (PFU/sample) +/- SEM**	**Mean log_{10} decrease from day 0**
Day 0	6167+/- 1258	n/a
Day 1	211+/- 116	1.5
Day 2	346+/- 165	1.3
Day 3	181+/-79	1.6
Day 4	<25	>2.4

Table 94 Test AL5: Aluminium can, 6˚C, 53% RH

Time	**Mean number of plaques (PFU/sample) +/- SEM**	**Mean log_{10} decrease from day 0**
Day 0	6167+/- 1258	n/a
Day 1	77+/- 52	1.9
Day 2	47+/- 22	2.1
Day 3	<25	>2.4
Day 4	<25	>2.4
Day 5	<25	>2.4
Day 6	<25	>2.4
Day 7	<25	>2.4

Table 95 Test AL6: Aluminium can, 6˚C, 20% RH

Time	**Mean Number of plaques (PFU/sample) +/- SEM**	**Mean log_{10} decrease from day 0**
Day 0	6167+/- 1258	n/a
Day 1	272+/- 157	1.4

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 2	271+/- 125	1.4
Day 3	<25	>2.4
Day 4	<25	>2.4

Table 96 Test AL7: Aluminium can, 21˚C, 53% RH

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
0 hours	6167+/- 1258	n/a
3 hours	3342+/- 472	0.27
6 hours	883+/- 252	0.84
24 hours	<25	>2.4

9.2.2.5 Aluminium cans with added mucin

The results for aluminium cans incubated with added mucin for up to 7 days with SARS-CoV-2 can be seen in Table 97, Table 98, Table 99, Table 100, Table 101, Table 102 and Table 103. For all tests, the means; SEM of the mean and log_{10} reduction of PFU over time are shown. The mean log_{10} decrease (shown to 2 significant figures) compares the PFU recovered at each time point to the PFU recovered at day 0, not to the initial inoculum. All tests were performed in triplicate. The limit of detection for this assay is 25 PFU/sample. Therefore, 2.3 is the maximum log_{10}-reduction detectable with this assay design, equivalent to 25 PFU or fewer infectious virus remaining. Log_{10} decrease was calculated to 2 s.f.

Table 97 Test AL1M: Aluminium can, mucin, 21˚C, 80% RH

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 0	5542+/- 494	n/a
Day 1	80+/- 26	1.8
Day 2	<25	>2.3
Day 3	<25	>2.3
Day 4	<25	>2.3

Table 98 Test AL2M: Aluminium can, mucin, 21˚C, 53% RH

Time	**Mean number of plaques (PFU/sample) +/- SEM**	**Mean log_{10} decrease from day 0**
Day 0	5542+/- 494	n/a
Day 1	<25	>2.3
Day 2	<25	>2.3
Day 3	<25	>2.3
Day 4	<25	>2.3
Day 5	<25	>2.3
Day 6	<25	>2.3
Day 7	<25	>2.3

Table 99 Test AL3M: Aluminium can, mucin, 21˚C, 20% RH

Time	**Mean Number of plaques (PFU/sample) +/- SEM**	**Mean log_{10} decrease from day 0**
Day 0	5542+/- 494	n/a
Day 1	<25	>2.3
Day 2	<25	>2.3
Day 3	<25	>2.3
Day 4	<25	>2.3

Table 100 Test AL4M: Aluminium can, mucin, 6˚C, 80% RH

Time	**Mean Number of plaques (PFU/sample) +/- SEM**	**Mean log_{10} decrease from day 0**
Day 0	5542+/- 494	n/a
Day 1	908+/- 812	0.79
Day 2	843+/- 249	0.82
Day 3	657+/- 131	0.93
Day 4	<25	>2.3

Table 101 Test AL5M: Aluminium can, mucin, 6˚C, 53% RH

Time	**Mean number of plaques (PFU/sample) +/- SEM**	**Mean log_{10} decrease from day 0**
Day 0	5542+/- 494	n/a
Day 1	129+/- 55	1.6

Time	**Mean number of plaques (PFU/sample) +/- SEM**	**Mean log_{10} decrease from day 0**
Day 2	99+/- 45	1.8
Day 3	<25	>2.3
Day 4	<25	>2.3
Day 5	<25	>2.3
Day 6	<25	>2.3
Day 7	<25	>2.3

Table 102 Test AL6M: Aluminium can, mucin, 6˚C, 20% RH

Time	**Mean Number of plaques (PFU/sample) +/- SEM**	**Mean log_{10} decrease from day 0**
Day 0	5542+/- 494	n/a
Day 1	833+/- 137	0.82
Day 2	318+/- 156	1.2
Day 3	<25	>2.3
Day 4	<25	>2.3

Table 103 Test AL7M: Aluminium can, mucin, 21˚C, 53% RH

Time	**Mean Number of plaques (PFU/sample) +/- SEM**	**Mean log_{10} decrease from day 0**
0 hours	5542+/- 494	n/a
3 hours	3193+/- 482	0.24
6 hours	542+/- 96	1.0
24 hours	<25	>2.3

9.2.2.6 Composite drinks cartons

The results for composite drinks cartons incubated without mucin for up to 7 days with SARS-CoV-2 can be seen in Table 104, Table 105, Table 106, Table 107, Table 108, Table 109, and Table 110. For all tests, the means; SEM of the mean and log_{10} reduction of PFU over time are shown. The mean log_{10} decrease (shown to 2 significant figures) compares the PFU recovered at each time point to the PFU recovered at day 0, not to the initial inoculum. All tests were performed in triplicate. The limit of detection for this assay is 25 PFU/sample. Therefore, 2.5 is the

maximum log_{10}-reduction detectable with this assay design, equivalent to 25 PFU or fewer infectious virus remaining. Log_{10} decrease was calculated to 2 s.f.

Table 104 Test CC1: Composite drinks carton, 21˚C, 80% RH

Time	**Mean Number of plaques (PFU/sample) +/- SEM**	**Mean log_{10} decrease from day 0**
Day 0	7333 +/- 882	n/a
Day 1	<25	>2.5
Day 2	<25	>2.5
Day 3	<25	>2.5
Day 4	<25	>2.5

Table 105 Test CC2: Composite drinks carton, 21˚C, 53% RH

Time	**Mean Number of plaques (PFU/sample) +/- SEM**	**Mean log_{10} decrease from day 0**
Day 0	7333 +/- 882	n/a
Day 1	<25	>2.5
Day 2	<25	>2.5
Day 3	<25	>2.5
Day 4	<25	>2.5
Day 5	<25	>2.5
Day 6	<25	>2.5
Day 7	<25	>2.5

Table 106 Test CC3: Composite drinks carton, 21˚C, 20% RH

Time	**Mean Number of plaques (PFU/sample) +/- SEM**	**Mean log_{10} decrease from day 0**
Day 0	7333 +/- 882	n/a
Day 1	<25	>2.5
Day 2	<25	>2.5
Day 3	<25	>2.5
Day 4	<25	>2.5

Table 107 Test CC4: Composite drinks carton, 6˚C, 80% RH

Time	**Mean Number of plaques (PFU/sample) +/- SEM**	**Mean log_{10} decrease from day 0**
Day 0	7333 +/- 882	n/a
Day 1	175 +/- 78	1.6
Day 2	121 +/- 67	1.8
Day 3	133 +/- 58	1.7
Day 4	<25	>2.5

Table 108 Test CC5: Composite drinks carton, 6˚C, 53% RH

Time	**Mean number of plaques (PFU/sample) +/- SEM**	**Mean log_{10} decrease from day 0**
Day 0	7333 +/- 882	n/a
Day 1	1413 +/- 365	0.72
Day 2	727 +/- 280	1.0
Day 3	<25	>2.5
Day 4	<25	>2.5
Day 5	<25	>2.5
Day 6	<25	>2.5
Day 7	<25	>2.5

Table 109 Test CC6: Composite drinks carton, 6˚C, 20% RH

Time	**Mean Number of plaques (PFU/sample) +/- SEM**	**Mean log_{10} decrease from day 0**
Day 0	7333 +/- 882	n/a
Day 1	<25	>2.5
Day 2	<25	>2.5
Day 3	<25	>2.5
Day 4	<25	>2.5

9.2.2.7 Composite drinks cartons with mucin

The results for composite drinks cartons incubated with added mucin for up to 7 days with SARS-CoV-2 can be seen in Table 110, Table 111, Table 112, Table 113, Table 114 and Table 115. For all tests, the means; SEM of the mean and log_{10} reduction of

PFU over time are shown. The mean log_{10} decrease (shown to 2 significant figures) compares the PFU recovered at each time point to the PFU recovered at day 0, not to the initial inoculum. All tests were performed in triplicate. The limit of detection for this assay is 25 PFU/sample. Therefore, 2.4 is the maximum log_{10}-reduction detectable with this assay design, equivalent to 25 PFU or fewer infectious virus remaining. Log_{10} decrease calculated to 2 s.f.

Table 110 Test CC1M: Composite drinks carton, mucin, 21˚C, 80% RH

Time	**Mean Number of plaques (PFU/sample) +/- SEM**	**Mean log_{10} decrease from day 0**
Day 0	6000 +/- 764	n/a
Day 1	<25	>2.4
Day 2	<25	>2.4
Day 3	<25	>2.4
Day 4	<25	>2.4

Table 111 Test CC2M: Composite drinks carton, mucin, 21˚C, 53% RH

Time	**Mean number of plaques (PFU/sample) +/- SEM**	**Mean log_{10} decrease from day 0**
Day 0	6000 +/- 764	n/a
Day 1	<25	>2.4
Day 2	<25	>2.4
Day 3	<25	>2.4
Day 4	<25	>2.4
Day 5	<25	>2.4
Day 6	<25	>2.4
Day 7	<25	>2.4

Table 112 Test CC3M: Composite drinks carton, mucin, 21˚C, 20% RH

Time	**Mean Number of plaques (PFU/sample) +/- SEM**	**Mean log_{10} decrease from day 0**
Day 0	6000 +/- 764	n/a
Day 1	<25	>2.4
Day 2	<25	>2.4
Day 3	<25	>2.4

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 4	<25	>2.4

Table 113 Test CC4M: Composite drinks carton, mucin, 6˚C, 80% RH

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 0	6000 +/- 764	n/a
Day 1	175 +/- 67	1.5
Day 2	<25	>2.4
Day 3	<25	>2.4
Day 4	<25	>2.4

Table 114 Test CC5M: Composite drinks carton, mucin, 6˚C, 53% RH

Time	Mean number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 0	6000 +/- 764	n/a
Day 1	1777 +/- 220	0.53
Day 2	750 +/- 75	0.90
Day 3	<25	>2.4
Day 4	<25	>2.4
Day 5	<25	>2.4
Day 6	<25	>2.4
Day 7	<25	>2.4

Table 115 Test CC6M: Composite drinks carton, mucin, 6˚C, 20% RH

Time	Mean Number of plaques (PFU/sample) +/- SEM	Mean log_{10} decrease from day 0
Day 0	6000 +/- 764	n/a
Day 1	<25	>2.4
Day 2	<25	>2.4
Day 3	<25	>2.4
Day 4	<25	>2.4