

Supplementary materials

| Sample # | Agent | Species |
|----------|--|---------|
| 1 | Belmont SH264 S13361 3/6/82 | Ovine |
| 2 | Bovine Ephemeral Fever 887721 B131 S14019 | Bovine |
| 3 | Bunyp Creek cs58 r721 s12223 | Bovine |
| 4 | Corriparta M96 S12162 18/7/79 | Ovine |
| 5 | Corriparta N99 MRM1 S12661 | Ovine |
| 6 | CSIRO Village cs11 r838 s12408 | Bovine |
| 7 | Eubanangiee R722 S12196 (In1074) 12/9/79 | Bovine |
| 8 | Eubanangiee A823 S12380 (CSIRO23) 18/12/79 | Bovine |
| 9 | Eubanangiee R956 S12526 (CSIRO32) 16/4/80 | Bovine |
| 10 | Facey's paddock SH247 S13357 3/6/82 | Ovine |
| 11 | Kawanyama SH293 S13374 3/6/82 | Ovine |
| 12 | Koongol SG551 S13359 3/6/82 | Ovine |
| 13 | Malignant Catarrhal Fever 334 S150976/9/91 | Bovine |
| 14 | Maputta SH226 S13358 3/6/82 | Ovine |
| 15 | Marrakai CS82 R853 S12772 | Ovine |
| 16 | Palyam D'Aguillar A842 S12752 21/7/80 | Bovine |
| 17 | Palyam D'aguillar b8112 r768 s12231 | Ovine |
| 18 | Palyam D'Aguillar R878 S12751 21/7/80 | Bovine |
| 19 | Paroo River SG680 S13356 3/6/82 | Ovine |
| 20 | Taggart SG554 S13360 3/6/82 | Ovine |
| 21 | Tilligerry R714 S12230 (NB7080) 8/10/79 | Bovine |
| 22 | Tilligerry R723 S12230 (NB7080) 8/10/79 | Bovine |
| 23 | Tilligerry R726 S12230 (NB7080) 9/10/79 | Bovine |
| 24 | Wallal 022 s12701 (CSIRO44) 2/7/80 | Ovine |
| 25 | Wallal L28 S12,162 (CSIRO44) 18/7/79 | Bovine |
| 26 | Warrego N85 S12409 (CSIRO12) 9/1/80 | Ovine |
| 27 | Warrego N98 S12409 (CSIRO12) 9/1/80 | Ovine |
| 28 | Warrego R833 S12409 (CSIRO12) 9/1/80 | Bovine |
| 29 | Warrego R843 S12409 (CSIRO12) 9/1/80 | Bovine |

Figure S1: Identity of 21 orbivirus and eight other non-orbivirus arbovirus positive sera.

| Number | EHD Positive panel ¹ | AAHL C-ELISA | | sELISA | | IDEXX | | VMRD | | IDVet | |
|--------|---------------------------------|---------------|-----------|----------------|-----------|---------------|-----------|---------------|-----------|---------------|-----------|
| | | Positive ≥32% | | >0.72 Positive | | <70 %Positive | | ≥60% Positive | | <40% Positive | |
| | | % inhib | Interpret | S/P ratio | Interpret | S/N % | Interpret | % inhib | Interpret | % Inhib | Interpret |
| 1 | anti EHD 2 | 1 | Negative | 2.52 | Positive | 98 | Negative | 34 | Negative | 89 | Negative |
| 2 | anti EHD 5 | 64 | Positive | 1.63 | Positive | 46 | Positive | 80 | Positive | 95 | Negative |
| 3 | anti EHD 6 | 16 | Negative | 0.79 | Positive | 82 | Negative | 31 | Negative | 95 | Negative |
| 4 | anti EHD 7 | -3 | Negative | 11.03 | Positive | 100 | Negative | 13 | Negative | 94 | Negative |
| 5 | anti EHD 8 | 44 | Suspect | 4.59 | Positive | 56 | Positive | 64 | Positive | 59 | Negative |
| 6 | 12-01347-0007 | 104 | Positive | 27.37 | Positive | 11 | Positive | 78 | Positive | 78 | Positive |
| 7 | 12-01347-0008 | 108 | Positive | 15.62 | Positive | 12 | Positive | 92 | Positive | 26 | Negative |
| 8 | 06-03694-0001 | 99 | Positive | 4.87 | Positive | 32 | Positive | 8 | Negative | 7.16 | Positive |
| 9 | 06-03694-0002 | 105 | Positive | 5.82 | Positive | 5 | Positive | -2 | Negative | 4.48 | Positive |
| 10 | 06-03694-0003 | 58 | Positive | 1.74 | Positive | 42 | Positive | 1 | Negative | 38 | Positive |
| 11 | 06-03694-0004 | 79 | Positive | 2.84 | Positive | 40 | Positive | 77 | Positive | 28 | Positive |
| 12 | 06-03694-0005 | 93 | Positive | 5.5 | Positive | 14 | Positive | 74 | Positive | 6 | Positive |
| 13 | 06-03694-0006 | 13 | Negative | 0.88 | Positive | 80 | Negative | 31 | Negative | 115 | Negative |
| 14 | 06-03694-0007 | 2 | Negative | 2.64 | Positive | 97 | Negative | 13 | Negative | 96 | Negative |
| 15 | 09-04228-0007 | 73 | Positive | 0.17 | Negative | 94 | Negative | 95 | Positive | 86 | Negative |
| 16 | 13-00995-0009 | -10 | Negative | 0.23 | Negative | 110 | Negative | 60 | Positive | 96 | Negative |
| 17 | 13-00995-0003 | 8 | Negative | 1.06 | Positive | 108 | Negative | -8 | Negative | 89 | Negative |
| 18 | 16-00269-0001 | -18 | Negative | 0.13 | Negative | 125 | Negative | -1 | Negative | 108 | Negative |
| 19 | 15-03524-0001 | -15 | Negative | -10 | Negative | 122 | Negative | 1 | Negative | 118 | Negative |
| 20 | 16-00126-0001 | -16 | Negative | -0.13 | Negative | 150 | Negative | 13 | Negative | 118 | Negative |
| 21 | 14-02495-0001 | 66 | Positive | 1.14 | Positive | 64 | Positive | 39 | Negative | 56 | Negative |
| 22 | 17-03205-0001 | 105 | Positive | 18.15 | Positive | 11 | Positive | 15 | Negative | 7 | Positive |
| 23 | 17-05607-0001 | 28 | Negative | 1.31 | Positive | 113 | Negative | 5 | Negative | 5 | Positive |
| 24 | 18-02706-0003 | -21 | Negative | -0.21 | Negative | 115 | Negative | 27 | Negative | 116 | Negative |
| 25 | 18-02444-0002 | -19 | Negative | -0.77 | Negative | 131 | Negative | -2 | Negative | 117 | Negative |
| 26 | 18-03208-0002 | -11 | Negative | 0.47 | Negative | 94 | Negative | -38 | Negative | 114 | Negative |

Figure S2: Analytical specificity: EHD positive sera.

| Sample # | Genus | Virus ID | AAHL cELISA | | sELISA | | IDEXX ELISA | | VMRD ELISA | | IDVet ELISA | |
|----------|-----------------|------------------------------|-------------|----------|----------------|----------|----------------------|----------|------------|----------|-------------|----------|
| | | | ≥40 % | | ≥0.62 or ≥0.36 | | ≤ 70% Pos >79 Neg | | ≥60% | | <50% | |
| | | | % Inhib | Interp. | S/P Ratio | Interp. | % of pos | Interp. | % Inhib | Interp. | % Inhib | Interp. |
| 1 | Orbivirus | Eubenangee | -6 | Negative | 0.81 | Positive | 102 | Negative | 24 | Negative | 78 | Negative |
| 2 | Orbivirus | Eubenangee | 83 | Positive | 0.31 | negative | 27 | Positive | 20 | Negative | 18 | Positive |
| 3 | Orbivirus | Eubenangee | -17 | Negative | 1.42 | Positive | 92 | Negative | 35 | Negative | 111 | Negative |
| 4 | Orbivirus | Tilligerry | -13 | Negative | 0.29 | negative | 76 | Suspect | 28 | Negative | 85 | Negative |
| 5 | Orbivirus | Tilligerry | -15 | Negative | 0.09 | negative | 96 | Negative | 43 | Negative | 76 | Negative |
| 6 | Orbivirus | Tilligerry | 12 | Negative | 0.01 | negative | 116 | Negative | 22 | Negative | 147 | Negative |
| 7 | Orbivirus | Wallal | 38 | Negative | 0.14 | negative | 121 | Negative | 48 | Negative | 133 | Negative |
| 8 | Orbivirus | Warrego | 95 | Positive | 0.31 | negative | 13 | Positive | 72 | Positive | 7 | Positive |
| 9 | Orbivirus | Warrego | 96 | Positive | 2.24 | Positive | 8 | Positive | 89 | Positive | 97 | Negative |
| 10 | Orbivirus | D'Aguillar | 7 | Negative | 0.24 | negative | 104 | Negative | 43 | Negative | 124 | Negative |
| 11 | Orbivirus | D'Aguillar | -5 | Negative | 0.32 | negative | 104 | Negative | 41 | Negative | 148 | Negative |
| 12 | Orbivirus | Bunyp Creek Village | -4 | Negative | -0.16 | negative | 117 | Negative | 5 | Negative | 110 | Negative |
| 13 | Orbivirus | CSIRO Village | 79 | Positive | 0.05 | negative | 27 | Positive | 81 | Positive | 13 | Positive |
| 14 | Orbivirus | Marrakai | 74 | Positive | 1.58 | Positive | 30 | Positive | 85 | Positive | 98 | Negative |
| 15 | Orbivirus | D'Aguillar | 60 | Positive | 0.17 | negative | 45 | Positive | 69 | Positive | 32 | Positive |
| 16 | Orbivirus | Corriparta | -43 | Negative | 0 | negative | 90 | Negative | 8 | Negative | 124 | Negative |
| 17 | Orbivirus | Wallal | -16 | Negative | 0.03 | negative | 76 | Suspect | 41 | Negative | 63 | Negative |
| 18 | Orbivirus | Warrego | 100 | Positive | 0 | negative | 16 | Positive | 95 | Positive | 5 | Positive |
| 19 | Orbivirus | Warrego | 99 | Positive | 0.24 | negative | 7 | Positive | 96 | Positive | 4 | Positive |
| 20 | Orbivirus | Paroo River | 100 | Positive | -0.18 | negative | 8 | Positive | 95 | Positive | 4 | Positive |
| 21 | Orbivirus | Corriparta | 85 | Positive | -0.1 | negative | 17 | Positive | 92 | Positive | 9 | Positive |
| 22 | Orthobunyavirus | Facey's Paddock | 10 | Negative | 0.09 | negative | 76 | Suspect | 43 | Negative | 42 | Negative |
| 23 | Orthobunyavirus | Koongol | 8 | Negative | 0.04 | negative | 90 | Negative | 47 | Negative | 56 | Negative |
| 24 | Orthobunyavirus | Maputta | 85 | Positive | -0.01 | negative | 81 | Negative | 41 | Negative | 41 | Negative |
| 25 | Orthobunyavirus | Taggart | 65 | Positive | 0.01 | negative | 80 | suspect | 22 | Negative | 93 | Negative |
| 26 | Orthobunyavirus | Kawanyama | -17 | Negative | 0.32 | negative | 111 | Negative | 0 | Negative | 97 | Negative |
| 27 | Orthobunyavirus | Belmont | -15 | Negative | -0.08 | negative | 102 | Negative | 62 | Positive | 46 | Negative |
| 28 | Ephemerovirus | Bovine Ephemeral Fever | -41 | Negative | -0.03 | negative | 111 | Negative | 8 | Negative | 135 | Negative |
| 29 | Macavirus | Malignant Catarrhal Fever | N/A | N/A | 2.33 | Positive | 118 | Negative | 5 | Negative | 139 | Negative |

Figure S3: Analytical specificity: positive sera to twenty-one orbiviruses and eight other arbovirus positive sera.