**Additional file 1: Table S1. Geographical location and characteristics of the farms evaluated in Antioquia and Arauca, Colombia.**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Farm | Latitude | Longitude | Department | Municipality | Population | Livestock units (LUs)/hectare | Samples collected | | | |
| Dry season | Wet season | Late wet season | Total |
| Cattle samples description | | | | | | | | | | |
| A | 863.423 | -7.669.935 | Antioquia | Necoclí | 1900 | 1.73 | 30 | 30 | 31 | 91 |
| B | 849.876 | -7.680.486 | Antioquia | Necoclí | 800 | 1.43 | 31 | 43 | 30 | 104 |
| C | 849.028 | -7.681.940 | Antioquia | Necoclí | 450 | 0.92 | 32 | 24 | 31 | 87 |
| D | 847.538 | -7.680.084 | Antioquia | Necoclí | 200 | 1.64 | 29 | 30 | 30 | 89 |
| E | 847.472 | -7.679.691 | Antioquia | Necoclí | 1700 | 1.39 | 0 | 33 | 28 | 61 |
| F | 840.752 | -7.660.850 | Antioquia | Necoclí | 1500 | 1.75 | 30 | 36 | 33 | 99 |
| G | 833.180 | -7.674.387 | Antioquia | Turbo | 1800 | 1.84 | 30 | 30 | 33 | 93 |
| H | 850.295 | -7.670.964 | Antioquia | Necoclí | 300 | 1.13 | 29 | 0 | 30 | 59 |
| I | 835.184 | -7.673.902 | Antioquia | Turbo | 200 | 1.12 | 15 | 0 | 19 | 34 |
| Total | | | | | | | 226 | 226 | 265 | 717 |
| K | 693.365 | -7.189.498 | Arauca | Saravena | 200 | 1.23 | 25 | 26 | 0 | 51 |
| L | 701.457 | -7.180.067 | Arauca | Saravena | 110 | 1.12 | 30 | 29 | 28 | 87 |
| M | 701.122 | -7.177.768 | Arauca | Saravena | 50 | 1.36 | 15 | 18 | 22 | 55 |
| N | 700.203 | -7.177.016 | Arauca | Saravena | 130 | 1.18 | 31 | 24 | 27 | 82 |
| O | 700.185 | -7.169.867 | Arauca | Arauquita | 90 | 0.82 | 30 | 29 | 24 | 83 |
| P | 695.110 | -7.165.200 | Arauca | Arauquita | 160 | 1.14 | 27 | 27 | 33 | 87 |
| Q | 691.465 | -7.163.848 | Arauca | Arauquita | 130 | 1.64 | 28 | 24 | 27 | 79 |
| R | 696.511 | -7.175.786 | Arauca | Saravena | 140 | 0.95 | 29 | 35 | 30 | 94 |
| S | 647.614 | -7.174.180 | Arauca | Tame | 110 | 0.75 | 0 | 0 | 25 | 25 |
| T | 649.795 | -7-170.067 | Arauca | Tame | 100 | Confinement | 25 | 25 | 22 | 72 |
| Total | | | | | | | 240 | 237 | 238 | 715 |
| Buffaloes samples description | | | | | | | | | | |
| H | 850.295 | -7.670.964 | Antioquia | Necoclí | 60 | 1.34 | 10 | 11 | 9 | 30 |
| I | 835.184 | -7.673.902 | Antioquia | Turbo | 90 | 1.23 | 15 | 10 | 14 | 39 |
| J | 845.500 | -7.676.521 | Antioquia | Necoclí | 180 | 1.11 | 32 | 30 | 21 | 83 |
| Total | | | | | | | 57 | 51 | 44 | 152 |

**Additional file 1: Table S2. Bivariate model of infection with *Babesia* spp., in livestock herds from Antioquia and Arauca, Colombia.**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Cattle | | | | Buffaloes | | | |
| Independent variables | Number of samples | Positive (%) | *χ2; df; P* | Independent variables | Number of samples | Positive (%) | *χ2; df; P* |
| *B. bigemina* |  |  |  |  |  |  |  |
| Age |  |  |  | Age |  |  |  |
| ≤ 1 year old | 358 | 160 (44.6) | **100.5;1;0.000** | ≤ 1 year old | 31 | 4 (12.9) | **2.5;1;0.111** |
| > 1 year old | 1074 | 187 (17.4) | > 1 year old | 121 | 6 (4.9) |
| Sex |  |  |  | Sex |  |  |  |
| Female | 1059 | 210 (19.8) | **40.5;1;0.000** | Female | 135 | 7 (5.1) | 3.8;1;0.051 |
| Male | 373 | 137 (36.7) | Male | 17 | 3 (17.6) |
| Breed |  |  |  | Breed |  |  |  |
| BI | 740 | 182 (24.5) | 0.5;2;0.749 | Carabao | 34 | 1 (2.9) | **7.1;3;0.067** |
| BI x BT | 297 | 67 (22.5) | Murra | 30 | 0 (0.0) |
| BT | 395 | 98 (24.8) | Mediterranean | 37 | 2 (5.4) |
|  |  |  |  | Crosses | 51 | 7 (13.7) |
| PCV |  |  |  | PCV |  |  |  |
| Anemic | 123 | 27 (21.9) | 20.9;1;0.830 | Anemic | 51 | 2 (3.9) | 0.8;1;0.348 |
| Normal | 1256 | 292 (23.2) | Normal | 101 | 8 (7.9) |
| Sampling season |  |  |  | Sampling season |  |  |  |
| Dry | 466 | 105 (22.5) | 1.1;2;0.555 | Dry | 57 | 2 (3.5) | 1.7;2;0.419 |
| Wet | 463 | 118 (25.4) | Wet | 51 | 5 (9.8) |
| Late wet | 503 | 124 (24.5) | Late wet | 44 | 3 (6.8) |
| Deparment |  |  |  | Deparment |  |  |  |
| Antioquia | 717 | 182 (25.3) | 1.0;1;0.308 | Antioquia | 152 | 10 (6.5) | - |
| Arauca | 715 | 165 (23.0) | - | - |  |  |
| Farming system |  |  |  | Farming system |  |  |  |
| Extensive | 1335 | 316 (23.6) | **3.3;1;0.066** | Extensive | 152 | 10 (6.5) | - |
| Intensive | 97 | 31 (31.9) | - | - |  |  |
| Production type |  |  |  | Production type |  |  |  |
| Beef production | 215 | 85 (39.5) | **29.5;1;0.000** | Beef production | 21 | 3 (14.2) | **2.3;1;0.125** |
| Dual purposes | 1217 | 262 (21.5) | Dual purposes | 131 | 7 (5.3) |
| Vector control |  |  |  | Babesiosis control |  |  |  |
| Yes | 358 | 73 (20.3) | **3.8;1;0.050** | Yes | 123 | 9 (7.3) | 0.5;1;0.450 |
| No | 1074 | 274 (25.5) | No | 29 | 1 (3.4) |
| Antiprotozoal drugs |  |  |  | Municipality |  |  |  |
| Yes | 307 | 55 (17.9) | **8.4;1;0.004** | Necoclí | 102 | 6 (5.8) | 2.3;1;0.621 |
| No | 1125 | 292 (25.9) | Turbo | 50 | 4 (8.0) |
| Municipality |  |  |  | - | - |  |  |
| Necoclí | 625 | 171 (27.3) | **50.1;4;0.000** | - | - |  |  |
| Turbo | 93 | 11 (11.8) | - | - |  |
| Saravena | 451 | 71(15.7) |  |  |  |  |
| Arauquita | 166 | 63 (37.9) |  |  |  |  |
| Tame | 97 | 31 (31.9) |  |  |  |  |
| *B. bovis* | | | | | | | |
| Age |  |  |  | Age |  |  |  |
| ≤ 1 year old | 358 | 96 (26.8) | **52.9;1;0.000** | ≤ 1 year old | 31 | 0 (0.0) | **8.4;1;0.004** |
| > 1 year old | 1074 | 111 (10.3) | > 1 year old | 121 | 27 (22.3) |
| Sex |  |  |  | Sex |  |  |  |
| Female | 1059 | 127 (11.9) | **18.6;1;0.000** | Female | 135 | 27 (20) | **4.1;1;0.042** |
| Male | 373 | 80 (21.4) | Male | 17 | 0 (0.0) |
| Breed |  |  |  | Breed |  |  |  |
| BI | 740 | 101 (13.6) | 1.0;2;0.575 | Carabao | 34 | 3 (8.8) | **6.9;3;0.075** |
| BI x BT | 297 | 48 (16.1) | Murra | 30 | 8 (26.6) |
| BT | 395 | 58 (14.6) | Mediterranean | 37 | 10 (27.0) |
|  |  |  |  | Crosses | 51 | 6 (11.7) |
| PCV |  |  |  | PCV |  |  |  |
| Anemic | 123 | 12 (9.7) | **2.4;1;0.177** | Anemic | 51 | 10 (19.6) | 0.1;1;0.672 |
| Normal | 1256 | 184 (14.6) | Normal | 101 | 17 (16.3) |
| Sampling season |  |  |  | Sampling season |  |  |  |
| Dry | 466 | 61 (13.0) | 1.3;2;0.512 | Dry | 57 | 11 (19.2) | 0.9;2;0.644 |
| Wet | 463 | 67 (14.4) | Wet | 51 | 7 (13.7) |
| Late wet | 503 | 79 (15.7) | Late wet | 44 | 9 (20.4) |
| Deparment |  |  |  | Deparment |  |  |  |
| Antioquia | 717 | 104 (14.5) | 0.0;1;0.839 | Antioquia | 152 | 27 (17.7) | - |
| Arauca | 715 | 102 (14.2) | - | - |  |  |
| Farming system |  |  |  | Farming system |  |  |  |
| Extensive | 1335 | 191 (14.3) | 0.3;1;0.554 | Extensive | 152 | 27 (17.7) | - |
| Intensive | 97 | 16 (16.4) | - | - |  |  |
| Production type |  |  |  | Production type |  |  |  |
| Beef production | 215 | 38 (17.6) | **2.0;1;0.145** | Beef production | 21 | 5 (23.8) | 0.61;1;0.435 |
| Dual purposes | 1217 | 169 (13.8) | Dual purposes | 131 | 22 (16.7) |
| Vector control |  |  |  | Babesiosis control |  |  |  |
| Yes | 358 | 55 (15.3) | 0.3;1;0.573 | Yes | 123 | 19 (15.4) | **2.3;1;0.124** |
| No | 1074 | 152 (14.1) | No | 29 | 8 (27.5) |
| Antiprotozoal drugs |  |  |  | Municipality |  |  |  |
| Yes | 307 | 32 (10.4) | **5.1;1;0.023** | Necoclí | 102 | 14 (13.7) | **3.3;1;0.063** |
| No | 1125 | 175 (15.5) | Turbo | 50 | 13 (26.0) |
| Municipality |  |  |  | - | - | - |  |
| Necoclí | 625 | 101 (16.1) | **13.1;4;0.030** | - | - | - |  |
| Turbo | 93 | 4 (4.3) | - | - | - |
| Saravena | 451 | 59 (13.0) |  |  |  |  |
| Arauquita | 166 | 27 (16.2) |  |  |  |  |
| Tame | 97 | 16 (16.4) |  |  |  |  |
| Note: Values in bold represent the variable that showed a *P < 0.25* according to the χ2 test and were included in the GEE analysis; (PCV) = packed cell volume; (VBP) = Vector borne pathogens; Given its identical frequency, variables (vector control) and (antiprotozoal drugs) were unified as babesiosis control in buffaloes. | | | | | | | |