

Supplementary Table 1. Total livestock units (LSU) for cattle in trade

| Year | Africa | % Change | America | % Change | Asia  | % Change | Europe | % Change | Oceania | % Change |
|------|--------|----------|---------|----------|-------|----------|--------|----------|---------|----------|
| 2000 | 57.47  |          | 75.34   |          | 38.49 |          | 56.22  |          | 63.97   |          |
| 2010 | 56.19  | –2.23    | 74.11   | –1.63    | 34.47 | –10.44   | 53.00  | –5.73    | 71.90   | 12.40    |
| 2020 | 54.27  | –3.42    | 73.16   | –1.28    | 33.77 | –2.03    | 50.83  | –4.09    | 71.43   | –0.65    |
| 2025 | 53.9   | –0.68    | 74.14   | 1.34     | 30.18 | –10.63   | 51.11  | 0.55     | 74.44   | 4.21     |
| 2030 | 53.18  | –1.34    | 73.93   | –0.28    | 28.6  | –5.24    | 50.18  | –1.82    | 76.39   | 2.62     |

\*Authors' own calculations based on FAOSTAT data.

Supplementary Table 2. Total livestock units (LSU) for buffalo in trade

| Year | Africa | % Change | Asia  | % Change | Europe | % Change |
|------|--------|----------|-------|----------|--------|----------|
| 2000 | 1.18   |          | 13.33 |          | 0.08   |          |
| 2010 | 0.98   | –16.95   | 14.27 | 7.05     | 0.15   | 87.50    |
| 2020 | 0.33   | –66.33   | 13.65 | –4.34    | 0.18   | 20.00    |
| 2025 | 0.9    | 172.73   | 13.51 | –1.03    | 0.11   | –38.89   |
| 2030 | 0.88   | –2.22    | 13.41 | –0.74    | 0.1    | –9.09    |

LSU = Total livestock units.

\*Authors' own calculations based on FAOSTAT data.

Supplementary Table 3. Methane emission from buffaloes (kilotonnes)

| Year | Africa | % Change | America | % Change | Asia     | % Change | Europe | % Change | Oceania | % Change |
|------|--------|----------|---------|----------|----------|----------|--------|----------|---------|----------|
| 2000 | 194.15 |          | 60.96   |          | 8766.10  |          | 12.78  |          | 0.0072  |          |
| 2010 | 210.00 | 8.17     | 65.51   | 7.46     | 10374.87 | 18.35    | 21.48  | 68.04    | 0.0083  | 15.28    |
| 2020 | 91.92  | –56.23   | 101.64  | 55.15    | 10974.47 | 5.78     | 26.25  | 22.16    | 0.0091  | 9.64     |
| 2025 | 222.29 | 141.83   | 105.94  | 4.23     | 11723.56 | 6.83     | 11.53  | –56.08   | 0.0097  | 6.59     |
| 2030 | 232.56 | 4.62     | 114.14  | 7.74     | 12279.09 | 4.74     | 9.47   | –17.87   | 0.0102  | 5.15     |

\*Authors' own calculations based on FAOSTAT data.

Supplementary Table 4. Methane emission from cattle (kilotonnes)

| Year | Africa  | % Change | America  | % Change | Asia     | % Change | Europe  | % Change | Oceania | % Change |
|------|---------|----------|----------|----------|----------|----------|---------|----------|---------|----------|
| 2000 | 5878.31 |          | 22854.59 |          | 13017.73 |          | 5558.81 |          | 1907.57 |          |
| 2010 | 7271.72 | 23.70    | 25264.95 | 10.55    | 11711.54 | –10.03   | 4908.72 | –11.69   | 1863.08 | –2.33    |
| 2020 | 9443.52 | 29.87    | 26981.5  | 6.79     | 12261.37 | 4.69     | 4691.41 | –4.43    | 1666.35 | –10.56   |
| 2025 | 8574.73 | –9.20    | 28572.2  | 5.90     | 13117.6  | 6.98     | 4577.69 | –2.42    | 2011.62 | 20.72    |
| 2030 | 9026.33 | 5.27     | 29591.57 | 3.57     | 13396.21 | 2.12     | 4235.72 | –7.47    | 2048.14 | 1.82     |

\*Authors' own calculations based on FAOSTAT data.

Supplementary Table 5. Gross production value for buffalo meat (1000 US\$)

| Year | Africa     | % Change | Asia        | % Change | Europe  | % Change |
|------|------------|----------|-------------|----------|---------|----------|
| 2000 | 2077382.00 |          | 1570911.00  |          | 562.00  |          |
| 2010 | 4414556.00 | 112.51   | 5642255.00  | 259.17   | 1162.00 | 106.76   |
| 2020 | 3130138.00 | –29.10   | 14963039.00 | 165.20   | 1894.00 | 62.99    |
| 2025 | 4928331.27 | 57.45    | 11920056.20 | –20.34   | 1584.32 | –16.35   |
| 2030 | 5502254.07 | 11.65    | 13853457.70 | 16.22    | 1758.80 | 11.01    |

\*Authors' own calculations based on FAOSTAT data.

Supplementary Table 6. Gross production value for cattle meat (1000 US\$)

| Period | Africa      | %<br>Change | America      | %<br>Change | Asia         | %<br>Change | Europe      | %<br>Change | Oceania     | %<br>Change |
|--------|-------------|-------------|--------------|-------------|--------------|-------------|-------------|-------------|-------------|-------------|
| 2000   | 9689368.00  |             | 41416764.00  |             | 26020245.00  |             | 41377378.00 |             | 5347238.00  |             |
| 2010   | 29134026.00 | 200.68      | 89398768.00  | 115.85      | 81832277.00  | 214.49      | 71124996.00 | 71.89       | 12227610.00 | 128.67      |
| 2020   | 24884923.00 | -14.58      | 68919537.00  | -22.91      | 74110622.00  | -9.44       | 65768772.00 | -7.53       | 11529152.00 | -5.71       |
| 2025   | 36712743.72 | 47.53       | 117879828.01 | 71.04       | 125546726.64 | 69.40       | 72480457.76 | 10.20       | 15264086.26 | 32.40       |
| 2030   | 41301159.03 | 12.50       | 131897765.1  | 11.89       | 143846321.4  | 14.58       | 74637153.98 | 2.98        | 16810503.06 | 10.13       |

\*Authors' own calculations based on FAOSTAT data.

Supplementary Table 7. Region-wise beef cattle breeds

| Region/Continent | Breed                                                                                                                            |
|------------------|----------------------------------------------------------------------------------------------------------------------------------|
| British breeds   | Angus<br>Hereford<br>Shorthorn<br>Red Angus<br>Red Poll                                                                          |
| European breeds  | Charolais<br>Gelbvieh<br>Braunvieh<br>Maine-Anjou<br>Pinzgauer<br>Simmental<br>South Devon<br>Tarentaise<br>Chianina<br>Limousin |
| United States    | Hereford<br>Black and Red Angus<br>Simmental<br>Texas Longhorn<br>Beefmaster<br>Braford<br>Brangus<br>Santa Gertrudis<br>Simbrah |
| Africa           | Simmental<br>Zebu<br>The Africander<br>N'Dama<br>Ankole<br>Bonsmara<br>Boran<br>Mashona<br>Tuli                                  |
| India            | Brahman/Zebu                                                                                                                     |
| France           | Charolais<br>Salers<br>Tarentaise                                                                                                |
| Australia        | Australian Lowline<br>Beefmaker                                                                                                  |
| Japan            | Wagyu                                                                                                                            |