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Supplement of

Inferring methane emissions from African livestock by fusing drone, tower, and satellite data

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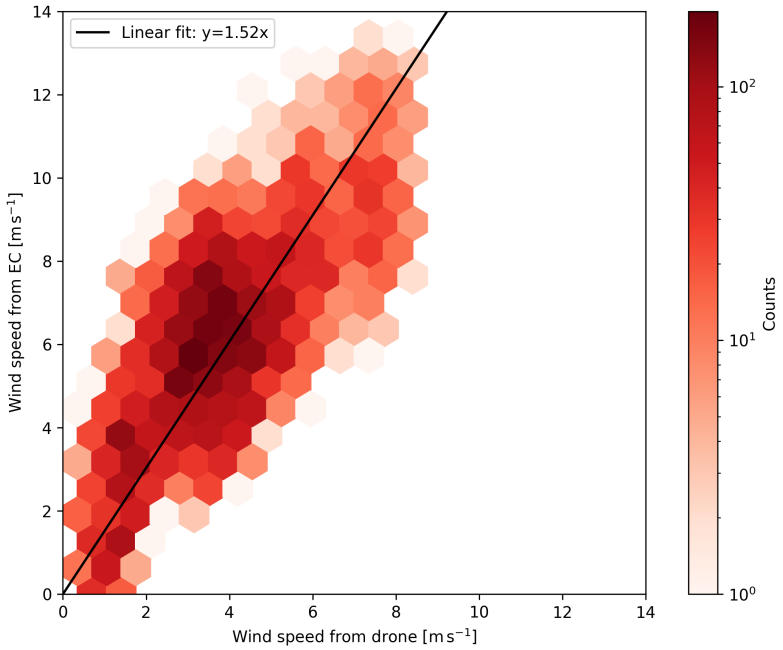

Figure S1. Correlation between the wind speed reported by the drone and the wind speed obtained by the anemometer on the eddy-covariance tower (EC). The data is obtained during hovering flights at the same altitude as the anemometer on the tower. The linear fit is used to correct the drone data.

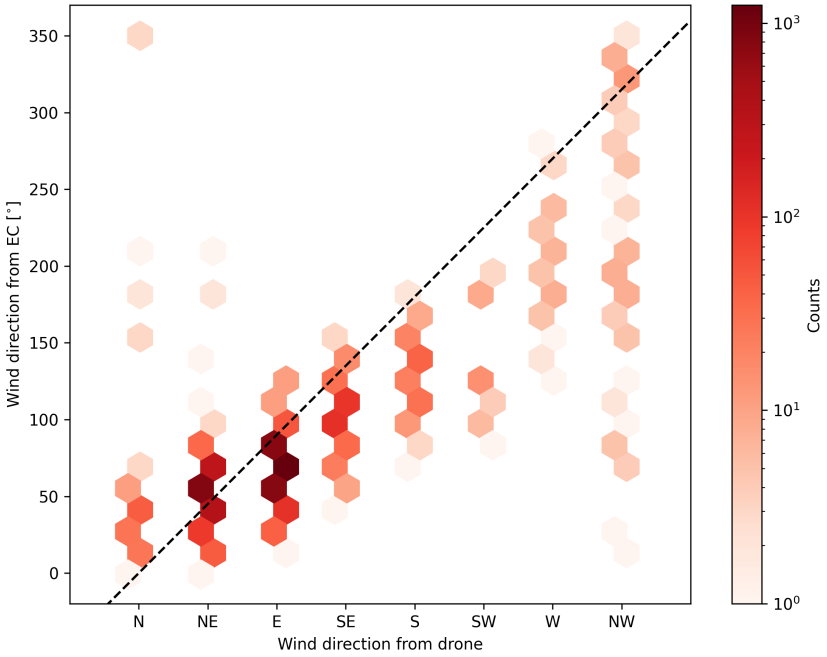

Figure S2. Correlation between the wind direction reported by the drone and the wind direction obtained by the anemometer on the eddy-covariance tower (EC). The data is obtained during hovering flights at the same altitude as the anemometer on the tower. The dashed line denotes a perfect linear fit: $y = x$.

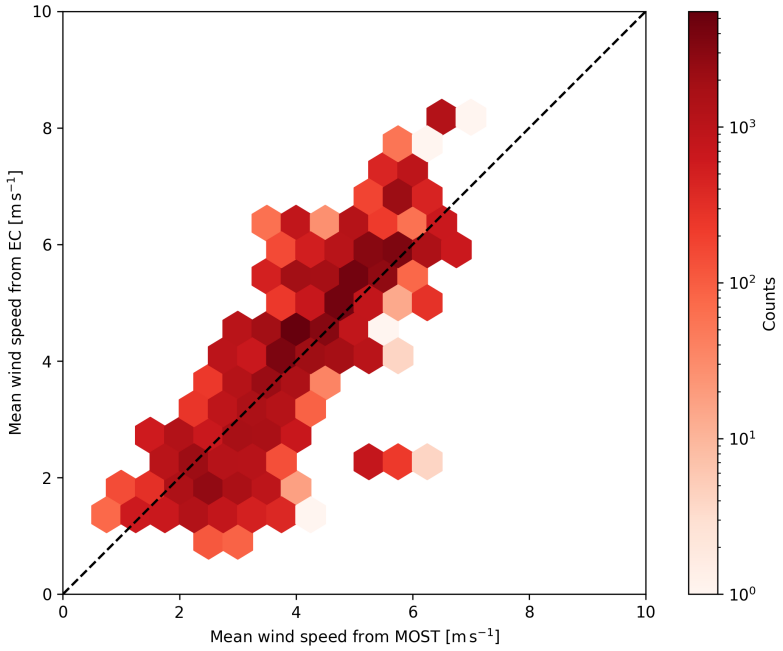

Figure S3. Correlation between the mean wind speed (over 30-min intervals) of the anemometer on the eddy-covariance tower (EC) and the mean wind speed from Monin Obukhov Similarity Theory at the height of the anemometer on the tower. The dashed line denotes a perfect linear fit: $y = x$.

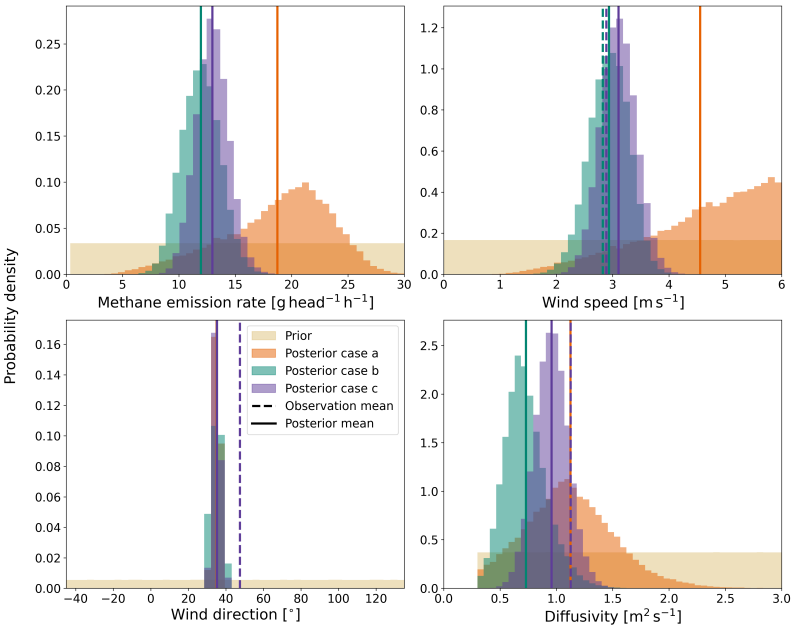

Figure S4. Bayesian inference method results for cows at 02/03/2024 07:45 Coordinated Universal Time (UTC) + 3 hours, corresponding to East Africa Time (EAT).

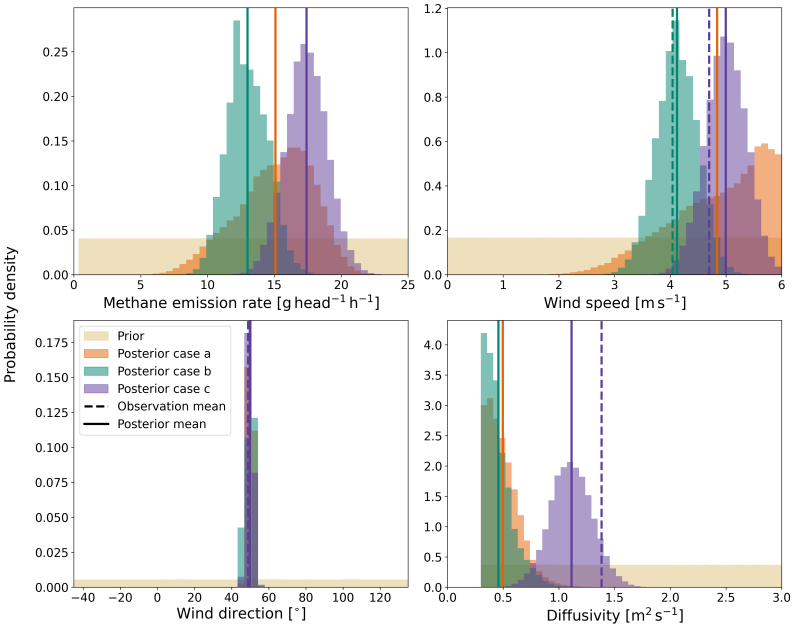

Figure S5. Bayesian inference method results for cows at 02/03/2024 13:05 UTC + 3 (EAT).

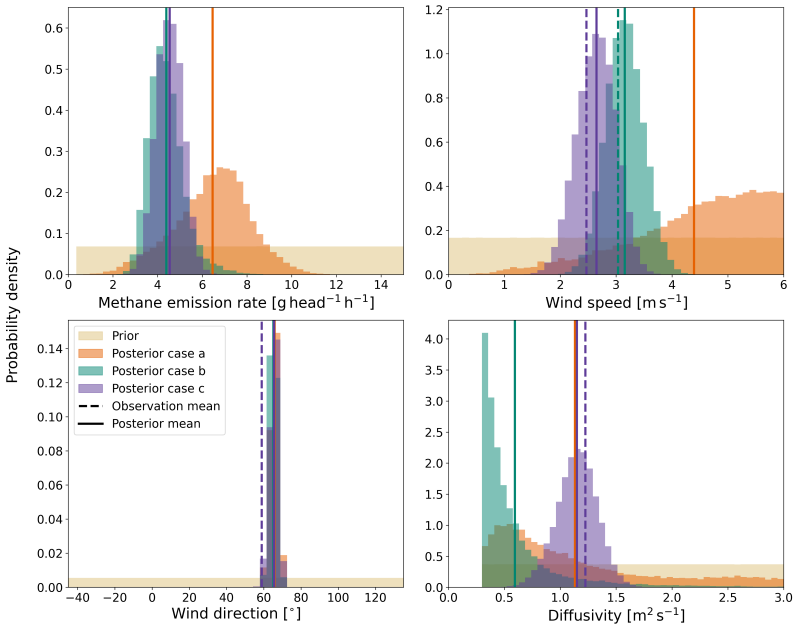

Figure S6. Bayesian inference method results for heifers at 02/03/2024 06:30 UTC + 3 (EAT).

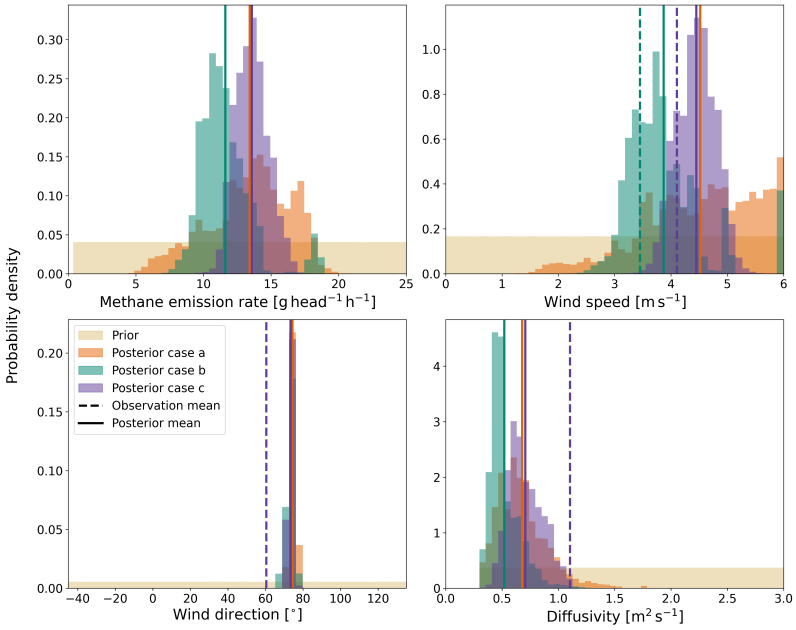

Figure S7. Bayesian inference method results for heifers at 02/03/2024 14:00 UTC + 3 (EAT).

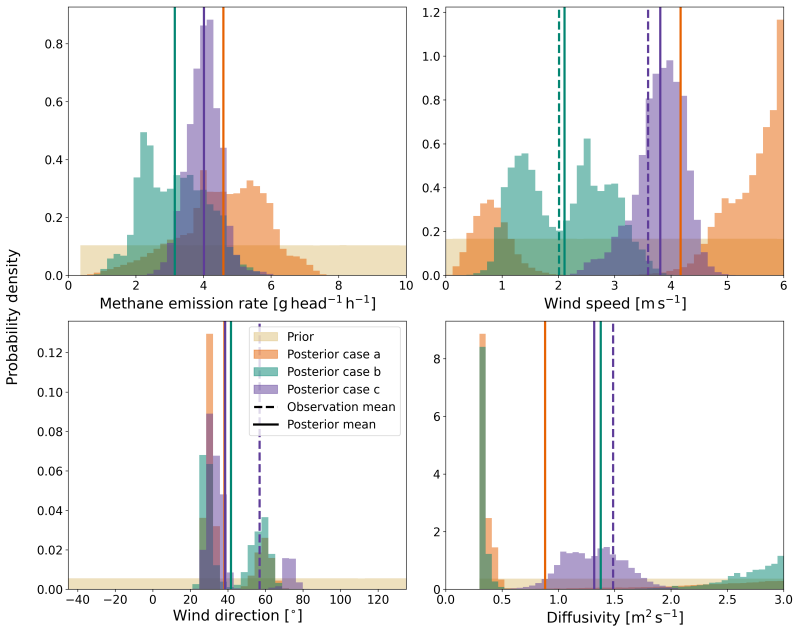

Figure S8. Bayesian inference method results for heifers at 06/03/2024 07:00 UTC + 3 (EAT).

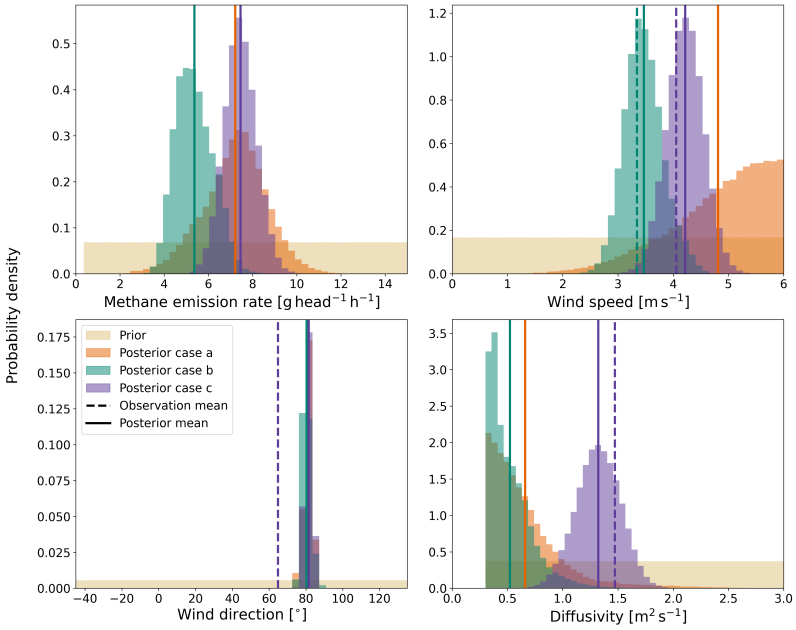

Figure S9. Bayesian inference method results for heifers at 06/03/2024 12:50 UTC + 3 (EAT).

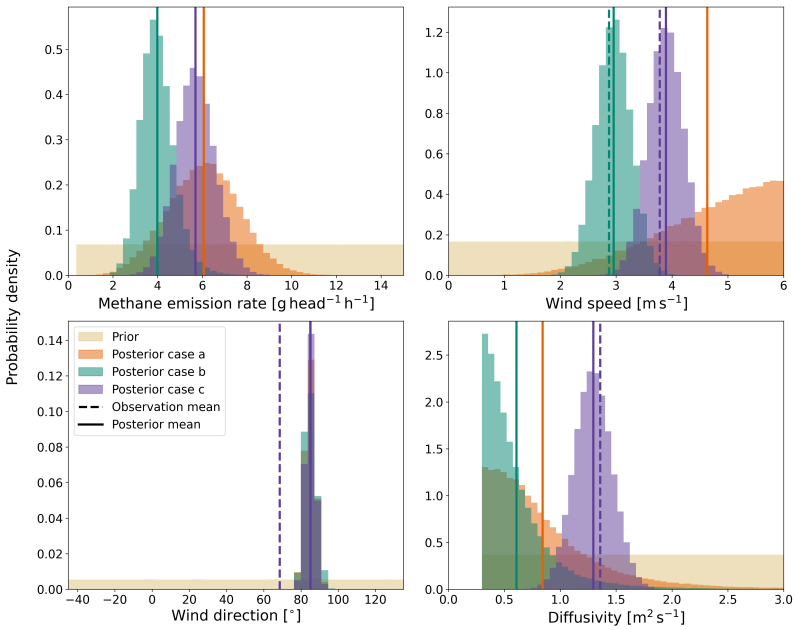

Figure S10. Bayesian inference method results for steers at 05/03/2024 06:15 UTC + 3 (EAT).

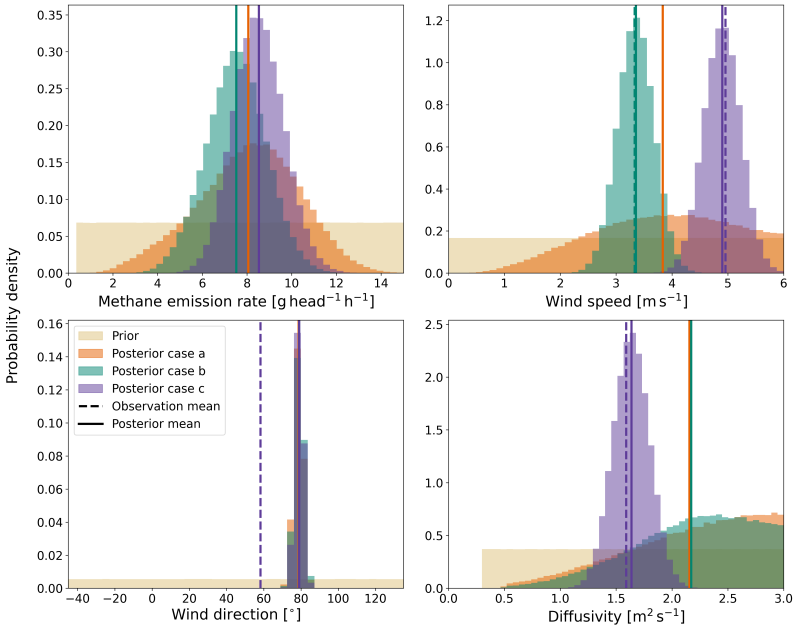

Figure S11. Bayesian inference method results for steers at 05/03/2024 11:55 UTC + 3 (EAT).

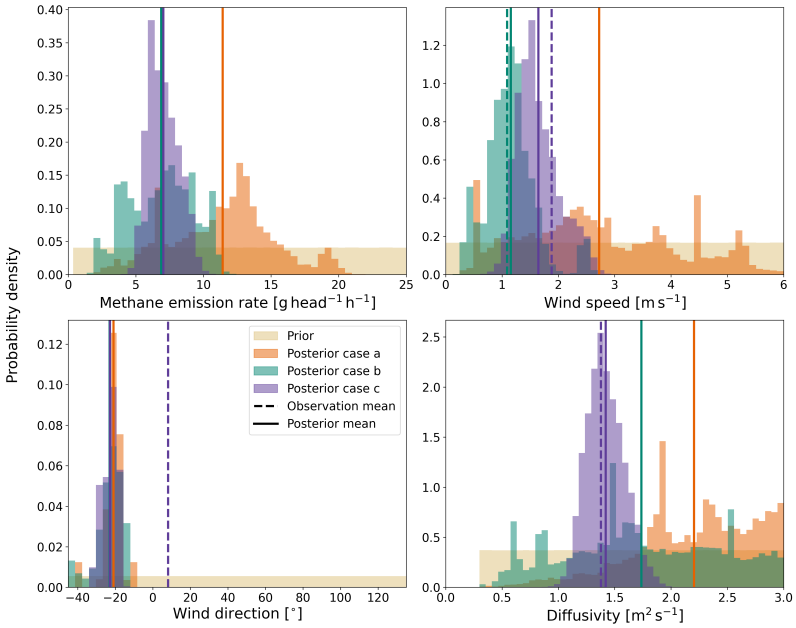

Figure S12. Bayesian inference method results for slick herd at 03/03/2024 07:05 UTC + 3 (EAT).

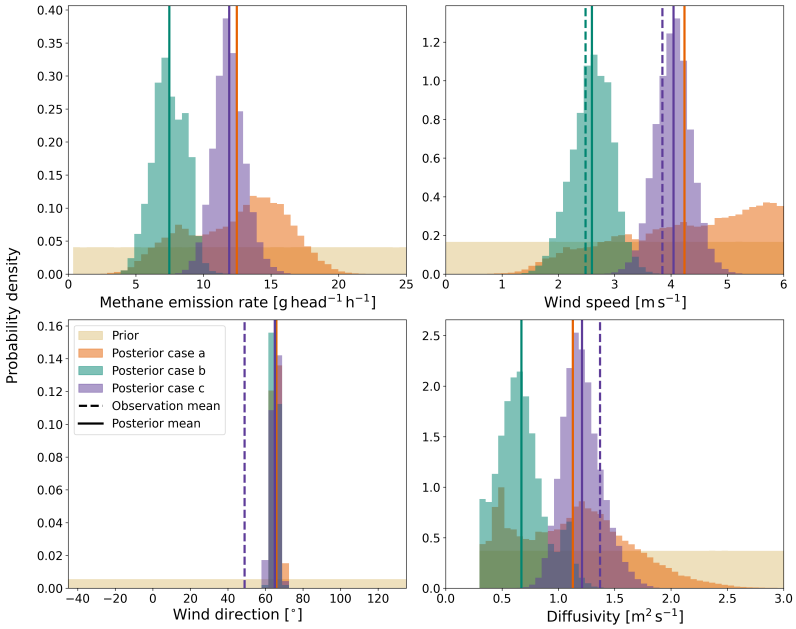

Figure S13. Bayesian inference method results for slick herd at 03/03/2024 12:10 UTC + 3 (EAT).

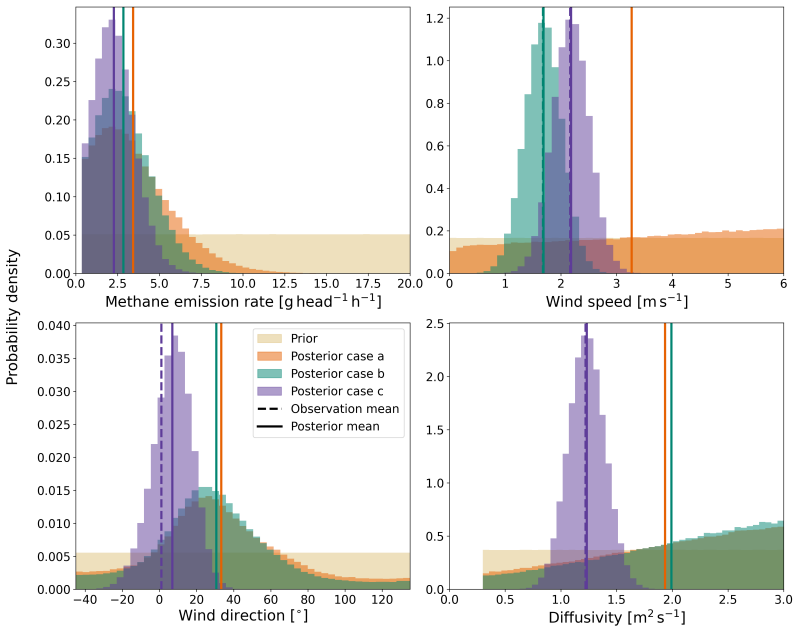

Figure S14. Bayesian inference method results for camels at 04/03/2024 06:25 UTC + 3 (EAT).

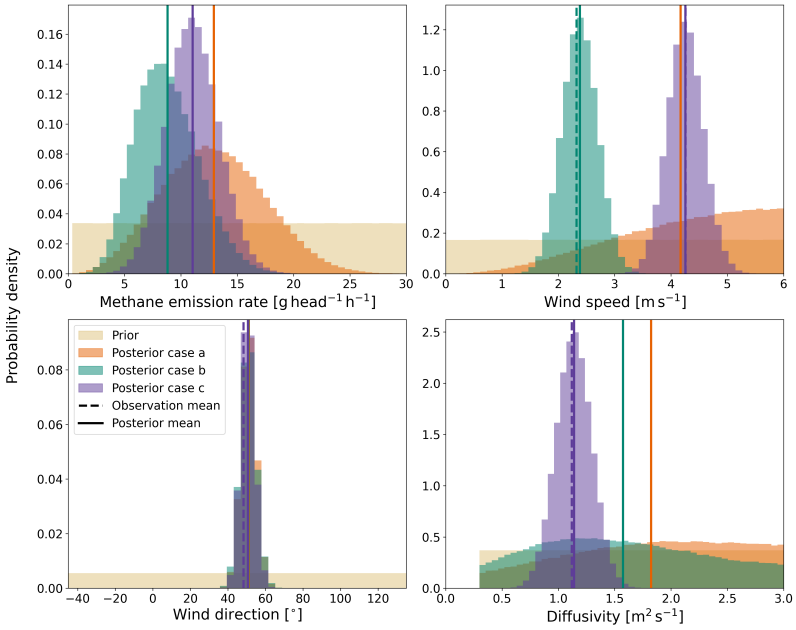

Figure S15. Bayesian inference method results for camels at 04/03/2024 12:00 UTC + 3 (EAT).

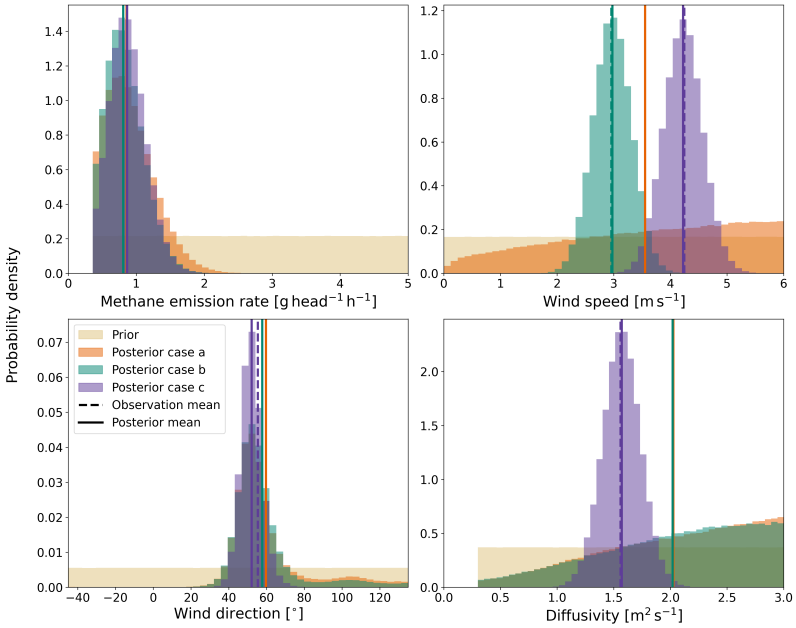

Figure S16. Bayesian inference method results for lactating ewes at 07/03/2024 07:40 UTC + 3 (EAT).

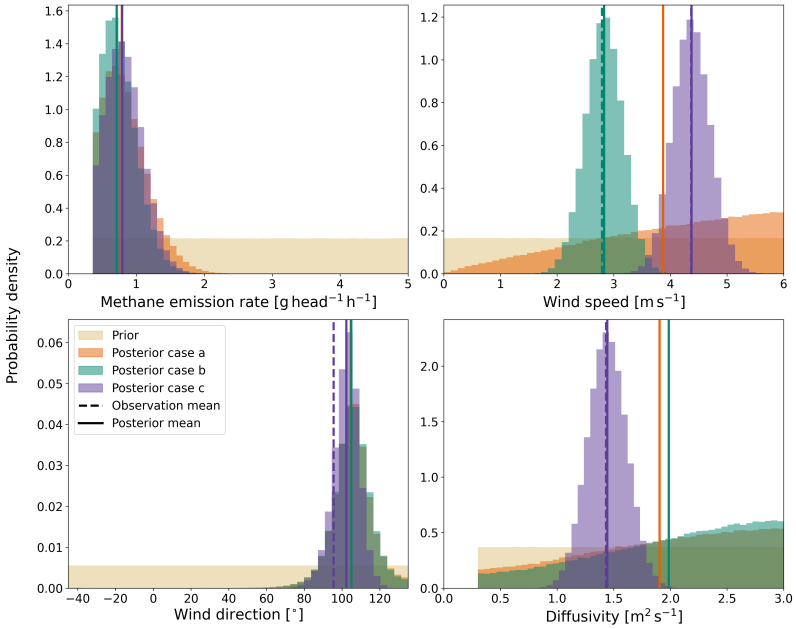

Figure S17. Bayesian inference method results for lactating ewes at 07/03/2024 13:25 UTC + 3 (EAT).

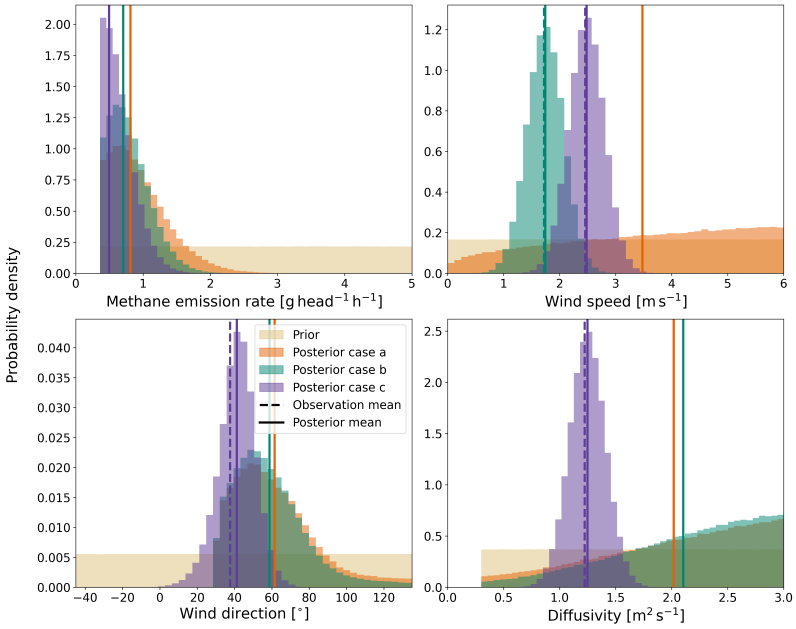

Figure S18. Bayesian inference method results for dry does at 01/03/2024 06:45 UTC + 3 (EAT). Wind direction prior is $\mathcal{U}(30, 135)$ for cases (a) and (b).

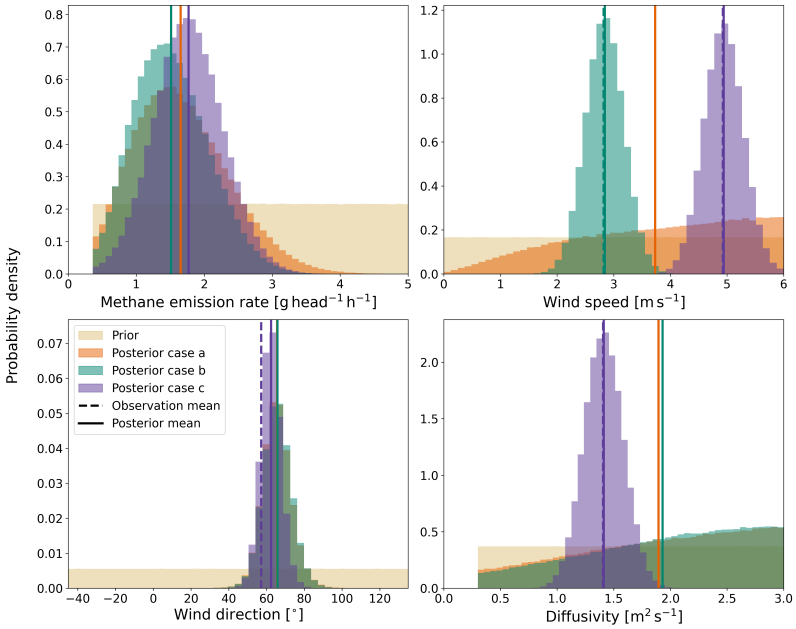

Figure S19. Bayesian inference method results for dry does at 01/03/2024 12:25 UTC + 3 (EAT). Wind direction prior is $\mathcal{U}(30, 135)$ for cases (a) and (b).

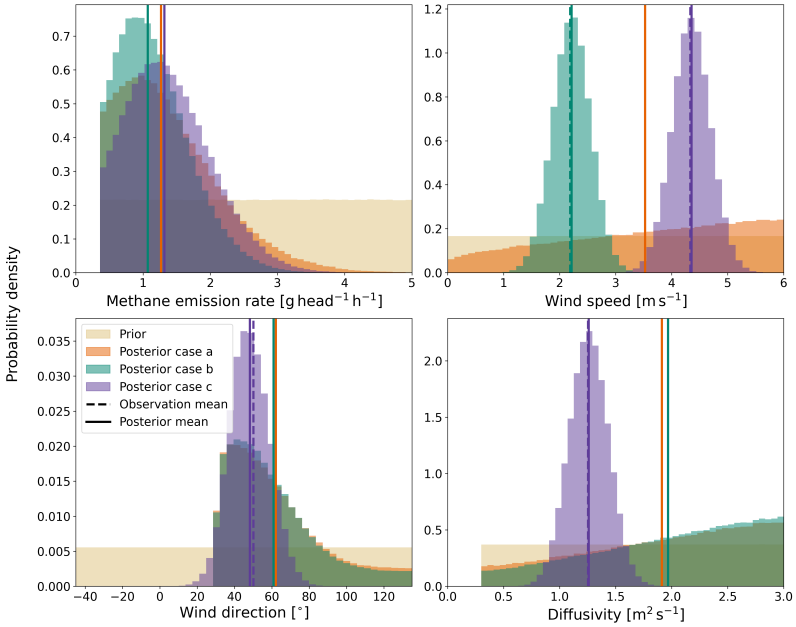

Figure S20. Bayesian inference method results for pregnant does at 29/02/2024 13:15 UTC + 3 (EAT). Wind direction prior is $\mathcal{U}(30, 135)$ for cases (a) and (b).

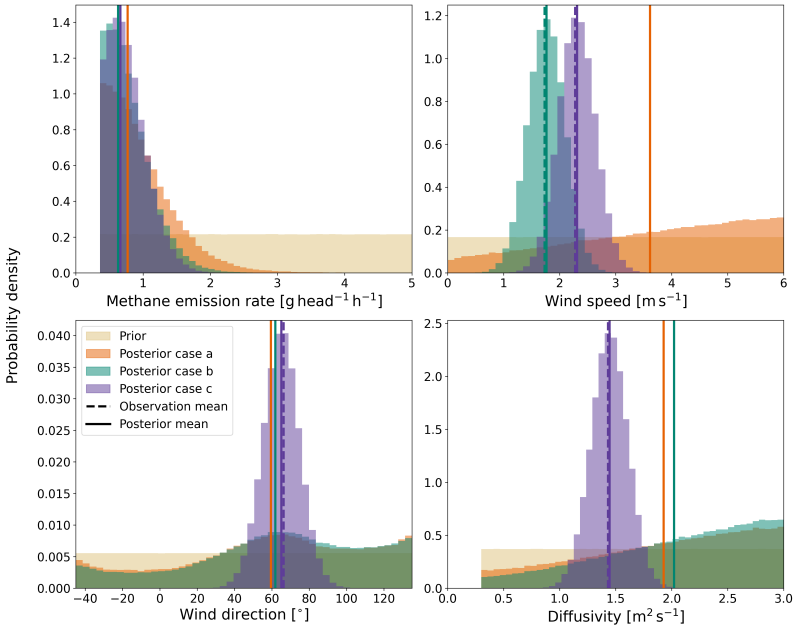

Figure S21. Bayesian inference method results for pregnant does at 07/03/2024 06:30 UTC + 3 (EAT).

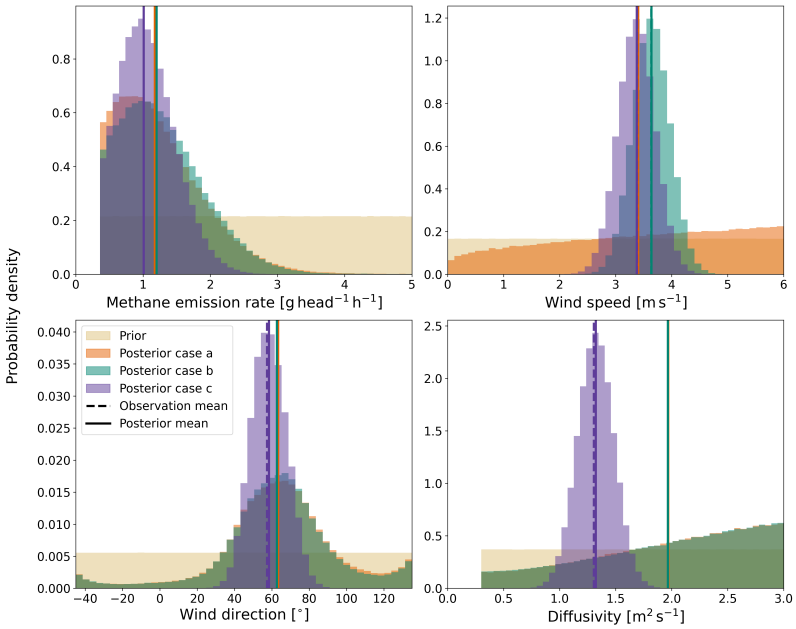

Figure S22. Bayesian inference method results for pregnant does at 07/03/2024 12:20 UTC + 3 (EAT).

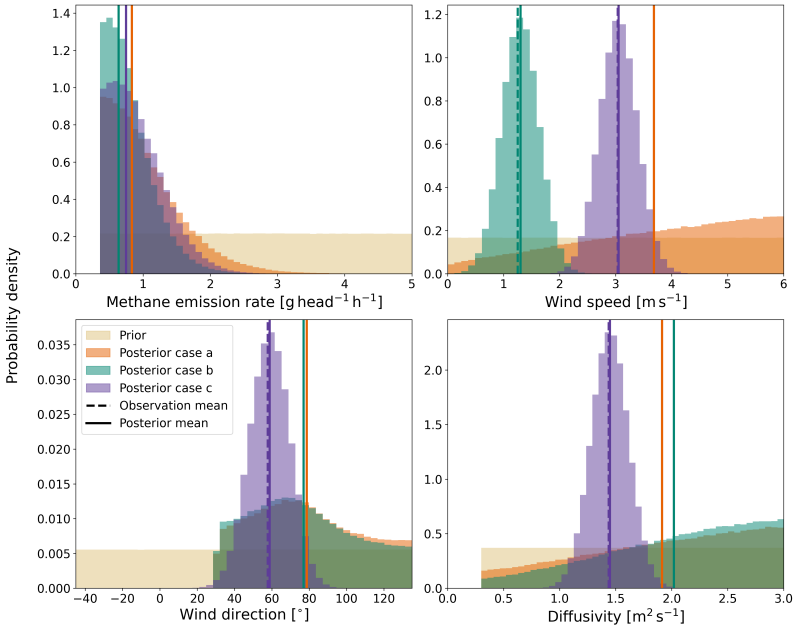

Figure S23. Bayesian inference method results for weaner kids at 01/03/2024 07:55 UTC + 3 (EAT). Wind direction prior is $\mathcal{U}(30, 135)$ for cases (a) and (b).

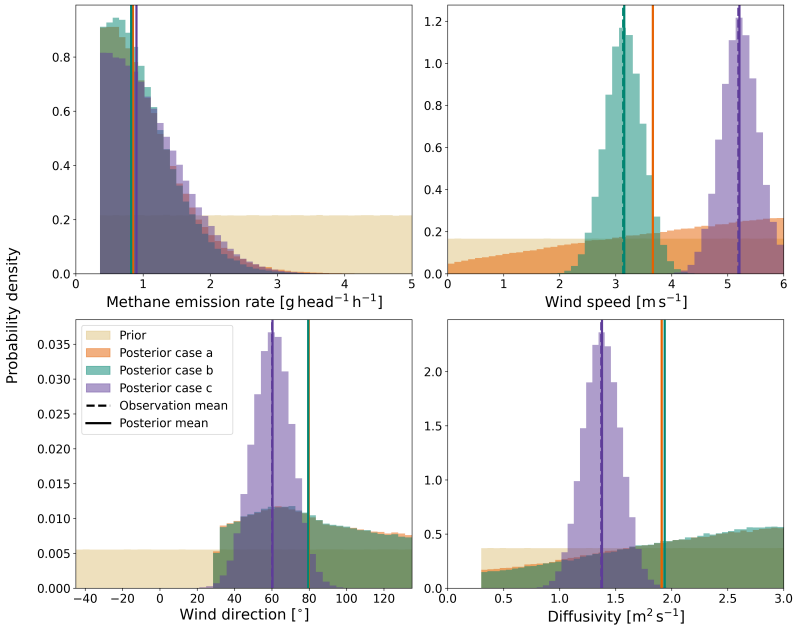

Figure S24. Bayesian inference method results for weaner kids at 01/03/2024 13:45 UTC + 3 (EAT). Wind direction prior is $\mathcal{U}(30, 135)$ for cases (a) and (b).

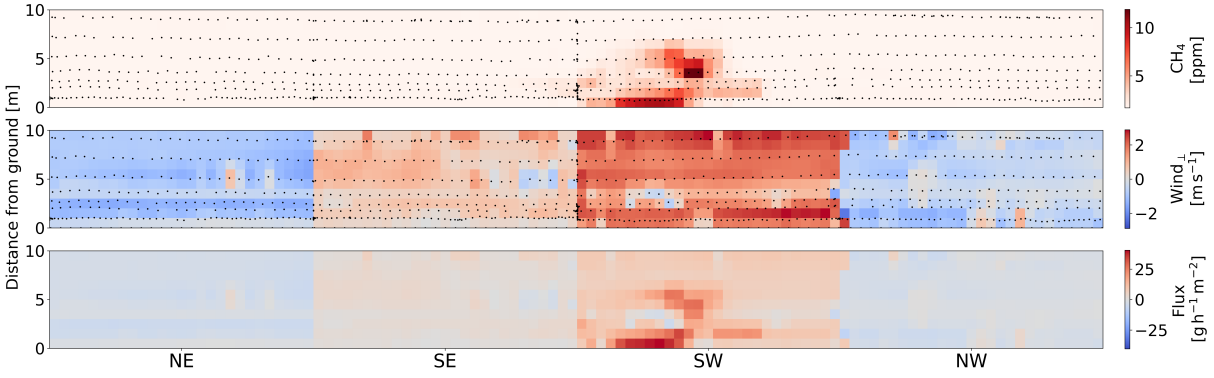

Figure S25. Mass balance method results for cows at 02/03/2024 07:10 UTC + 3 (EAT): $q = 18.3 \pm 2.5\,\mathrm{g\,head^{-1}\,h^{-1}}$.

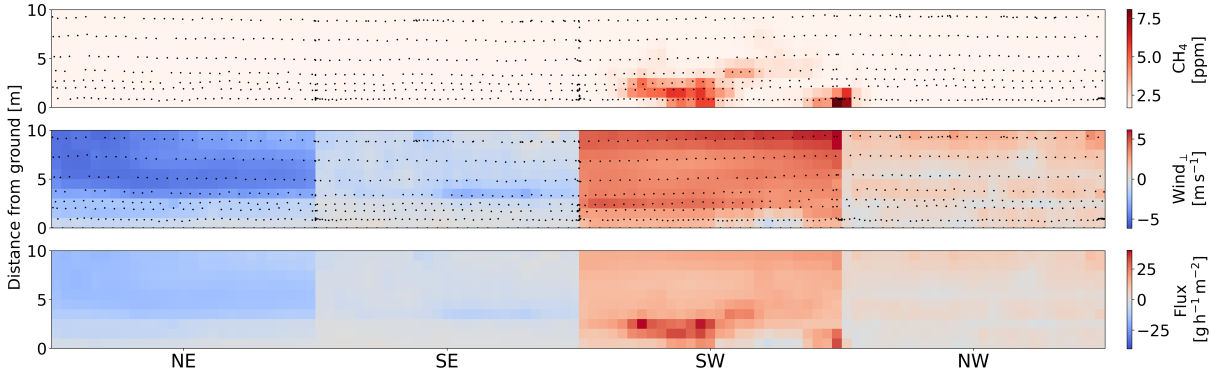

Figure S26. Mass balance method results for cows at 02/03/2024 12:40 UTC + 3 (EAT): $q = 10.6 \pm 3.1\,\mathrm{g\,head^{-1}\,h^{-1}}$.

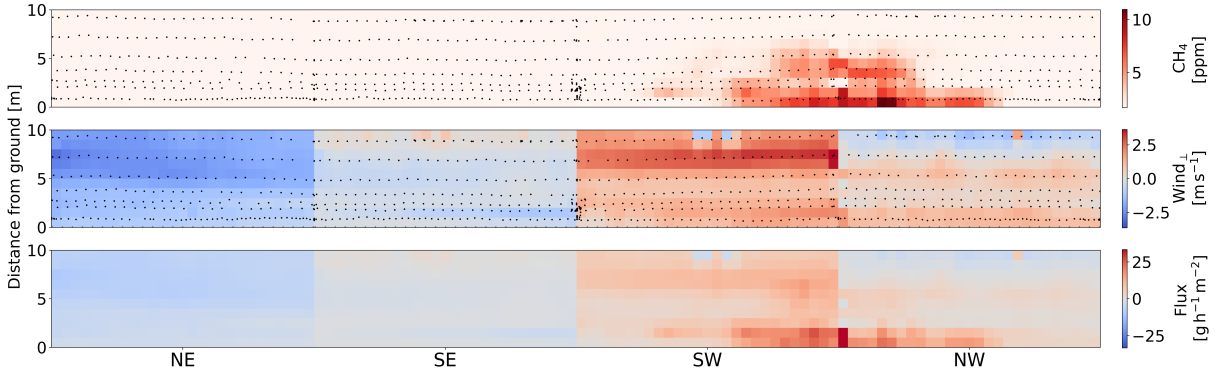

Figure S27. Mass balance method results for heifers at 02/03/2024 06:05 UTC + 3 (EAT): $q = 5.2 \pm 1.3\,\mathrm{g\,head^{-1}\,h^{-1}}$.

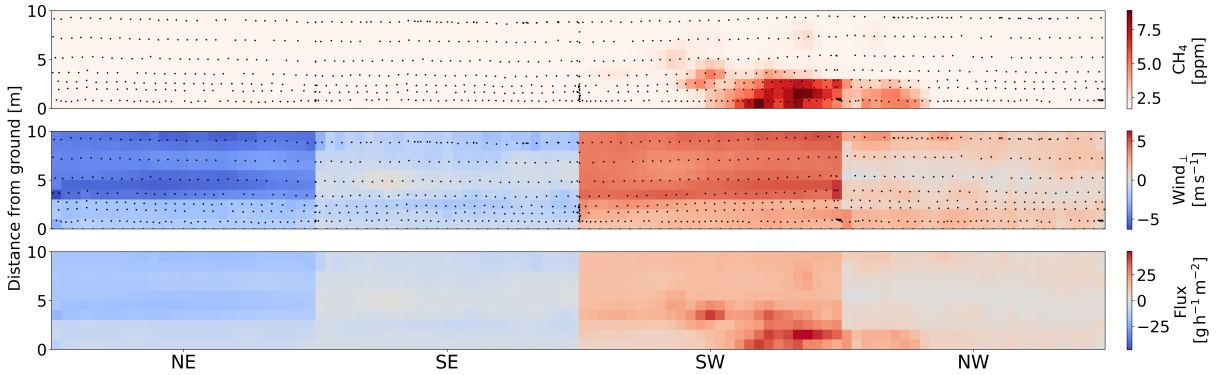

Figure S28. Mass balance method results for heifers at 02/03/2024 13:35 UTC + 3 (EAT): $q = 5.9 \pm 1.4\,\mathrm{g\,head^{-1}\,h^{-1}}$.

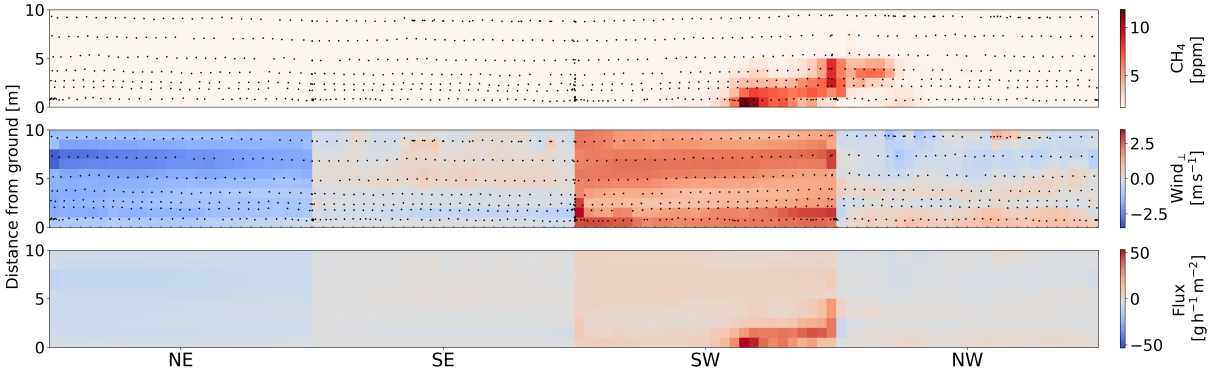

Figure S29. Mass balance method results for heifers at 06/03/2024 06:40 UTC + 3 (EAT): $q = 5.1 \pm 1.3\,\mathrm{g\,head^{-1}\,h^{-1}}$.

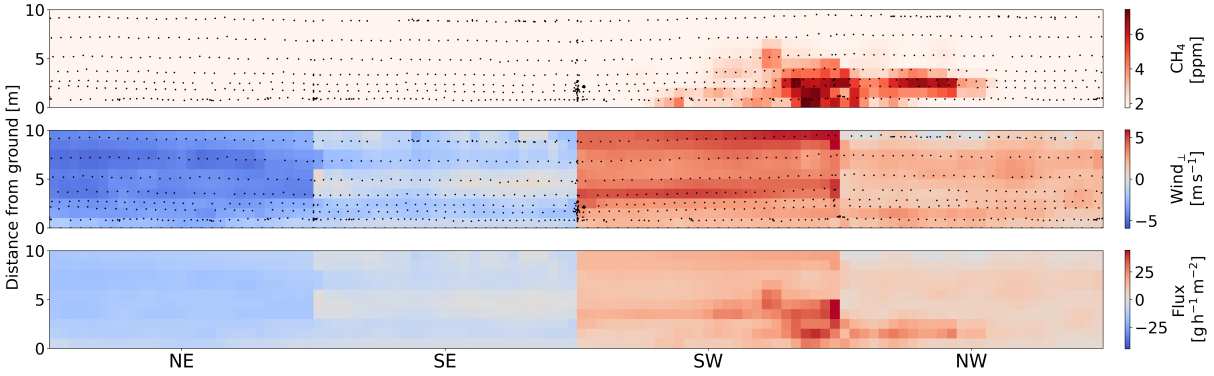

Figure S30. Mass balance method results for heifers at 06/03/2024 12:20 UTC + 3 (EAT): $q = 8.2 \pm 1.7\,\mathrm{g\,head^{-1}\,h^{-1}}$.

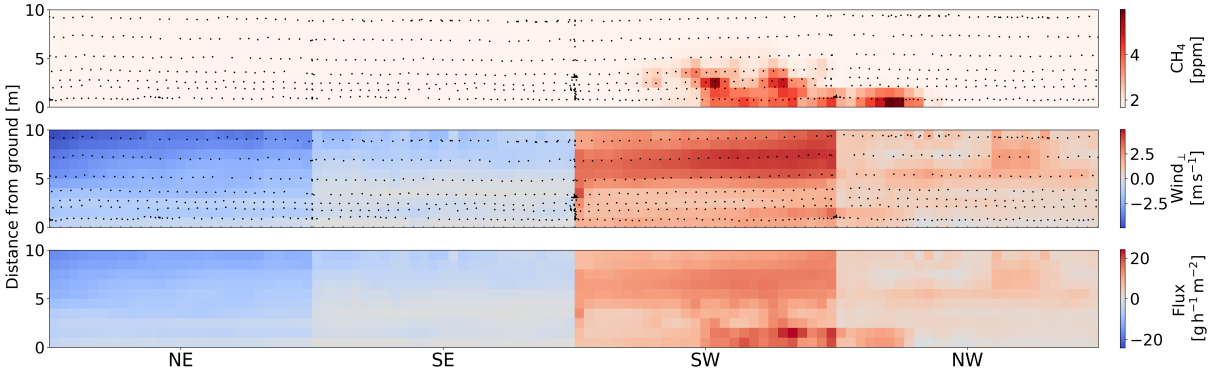

Figure S31. Mass balance method results for steers at 05/03/2024 05:50 UTC + 3 (EAT): $q = 9.5 \pm 2.1\,\mathrm{g\,head^{-1}\,h^{-1}}$.

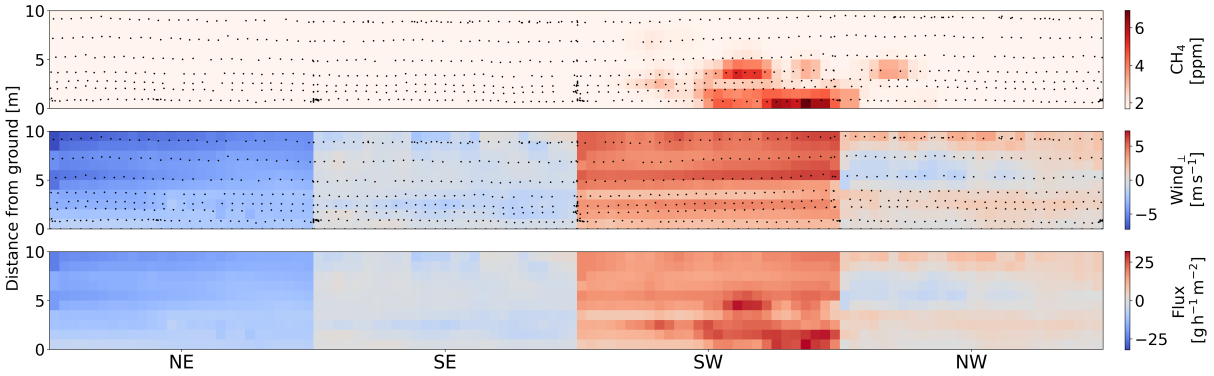

Figure S32. Mass balance method results for steers at 05/03/2024 11:30 UTC + 3 (EAT): $q = 7.4 \pm 2.5\,\mathrm{g\,head^{-1}\,h^{-1}}$.

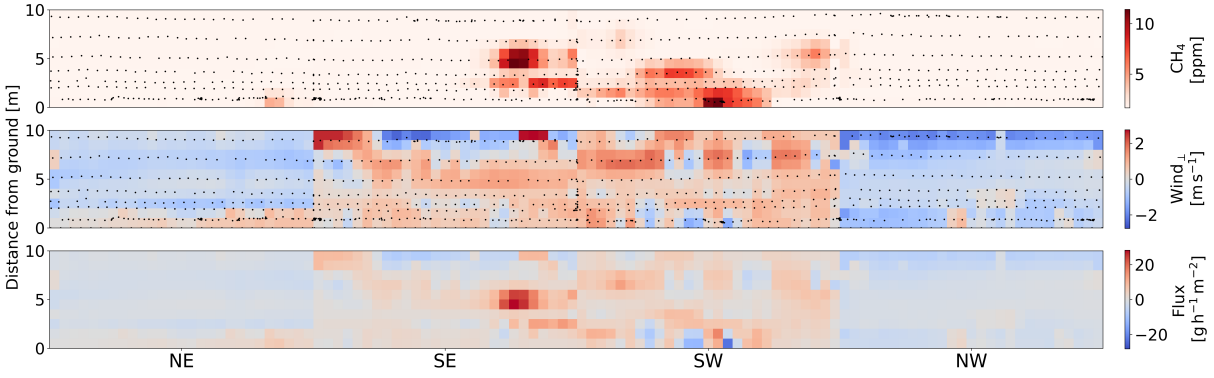

Figure S33. Mass balance method results for slick herd at 03/03/2024 06:30 UTC + 3 (EAT): $q = 3.3 \pm 2.2\,\mathrm{g\,head^{-1}\,h^{-1}}$. Marked as unreliable result.

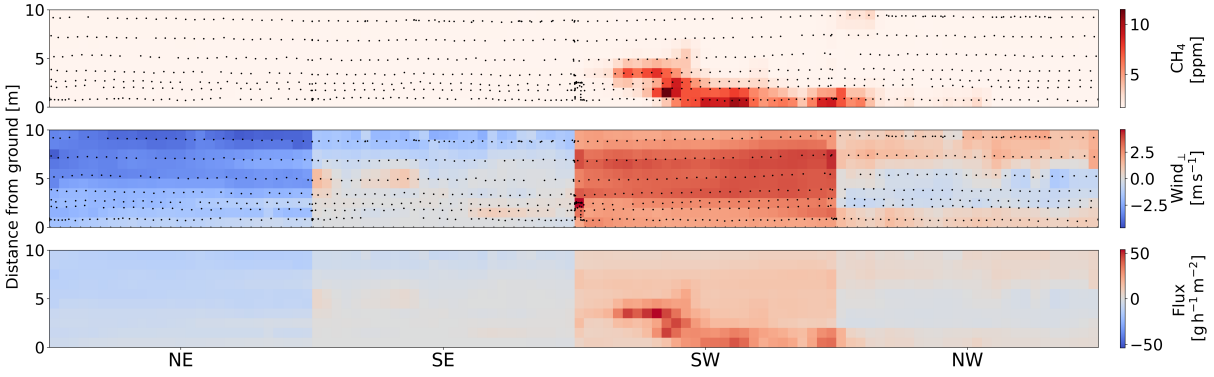

Figure S34. Mass balance method results for slick herd at 03/03/2024 11:45 UTC + 3 (EAT): $q = 12.5 \pm 2.1\,\mathrm{g\,head^{-1}\,h^{-1}}$.

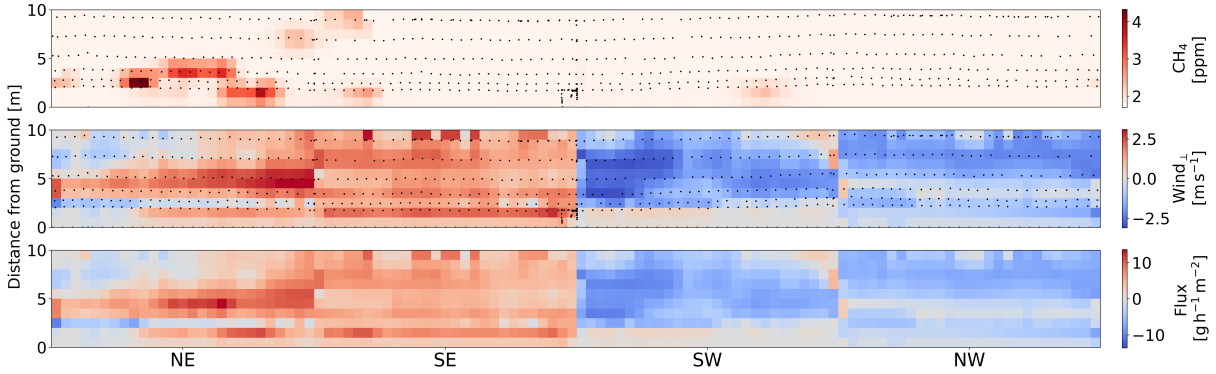

Figure S35. Mass balance method results for camels at 04/03/2024 05:55 UTC + 3 (EAT): $q = -2.6 \pm 7.4\,\mathrm{g\,head^{-1}\,h^{-1}}$. Marked as unreliable result.

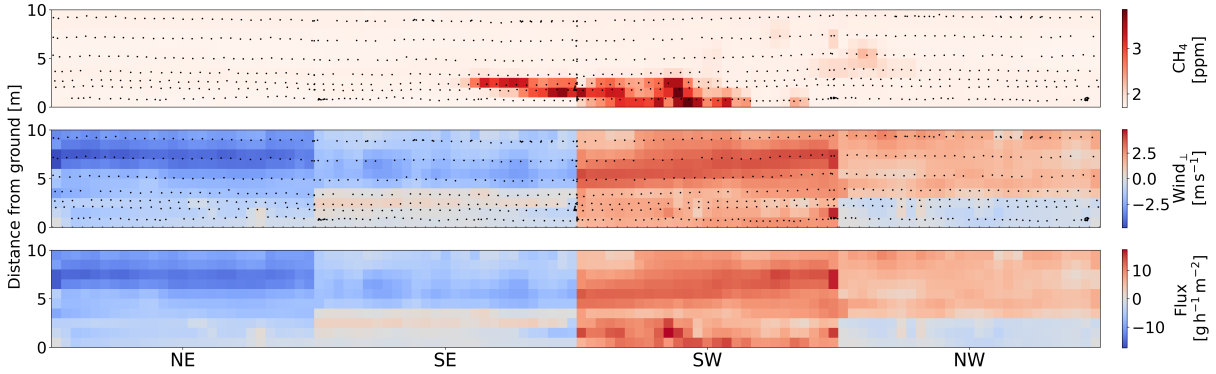

Figure S36. Mass balance method results for camels at 04/03/2024 11:40 UTC + 3 (EAT): $q = 8.4 \pm 6.9\,\mathrm{g\,head^{-1}\,h^{-1}}$.

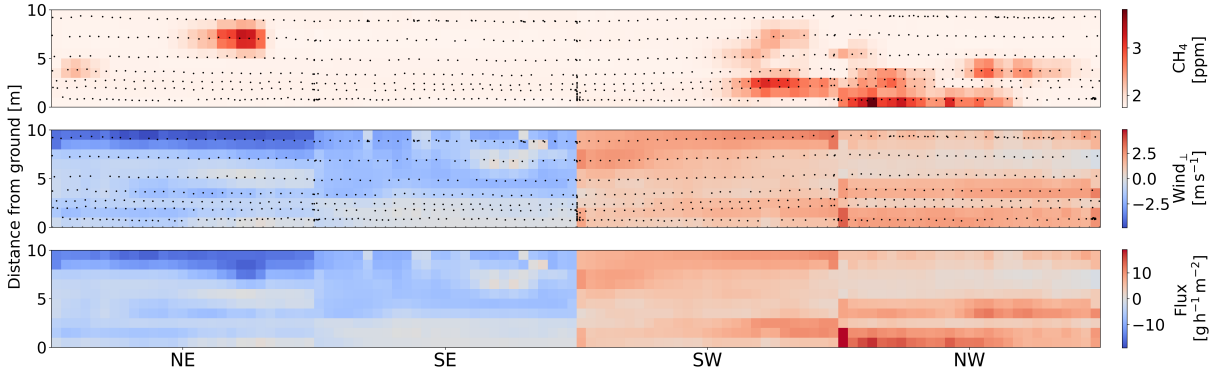

Figure S37. Mass balance method results for lactating ewes at 07/03/2024 07:15 UTC + 3 (EAT): $q = 0.2 \pm 0.7\,\mathrm{g\,head^{-1}\,h^{-1}}$. Marked as unreliable result.

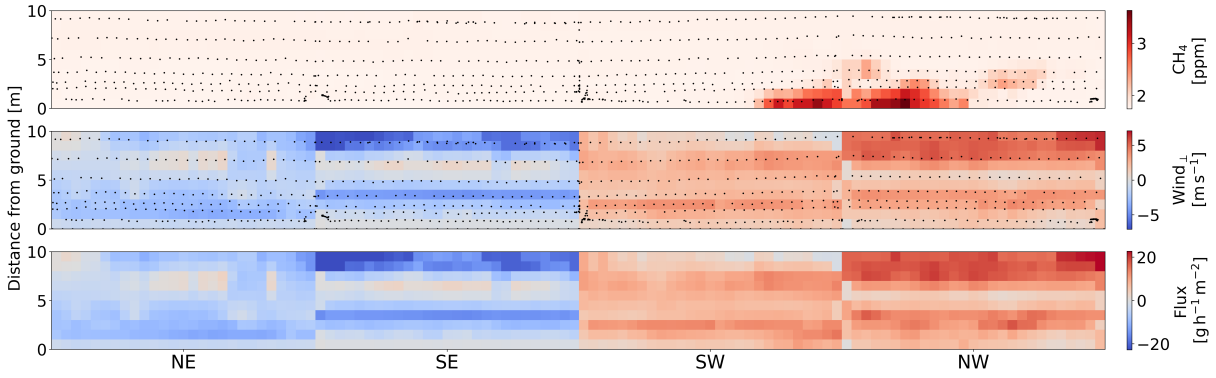

Figure S38. Mass balance method results for lactating ewes at 07/03/2024 13:00 UTC + 3 (EAT): $q = 4.2 \pm 1.4\,\mathrm{g\,head^{-1}\,h^{-1}}$. Marked as unreliable result.

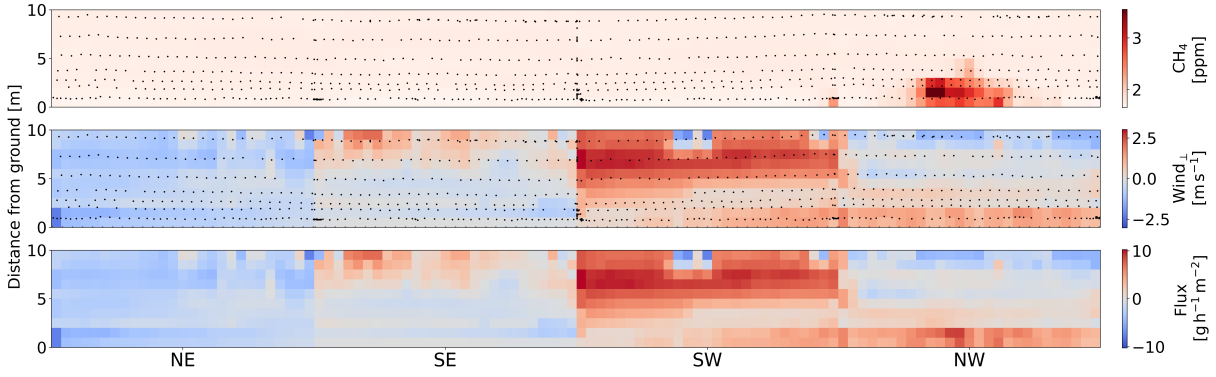

Figure S39. Mass balance method results for dry does at 01/03/2024 06:20 UTC + 3 (EAT): $q = 4.8 \pm 1.3\,\mathrm{g\,head^{-1}\,h^{-1}}$. Marked as unreliable result.

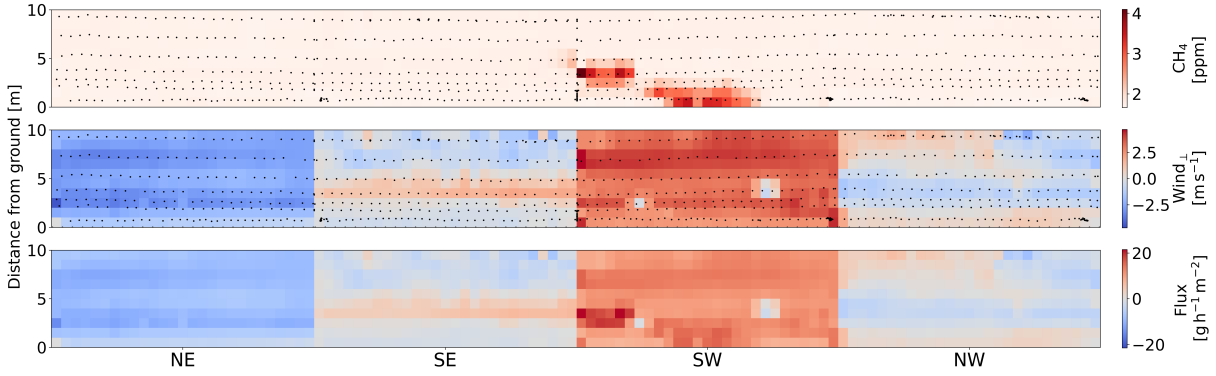

Figure S40. Mass balance method results for dry does at 01/03/2024 12:00 UTC + 3 (EAT): $q = 3.9 \pm 1.5\,\mathrm{g\,head^{-1}\,h^{-1}}$. Marked as unreliable result.

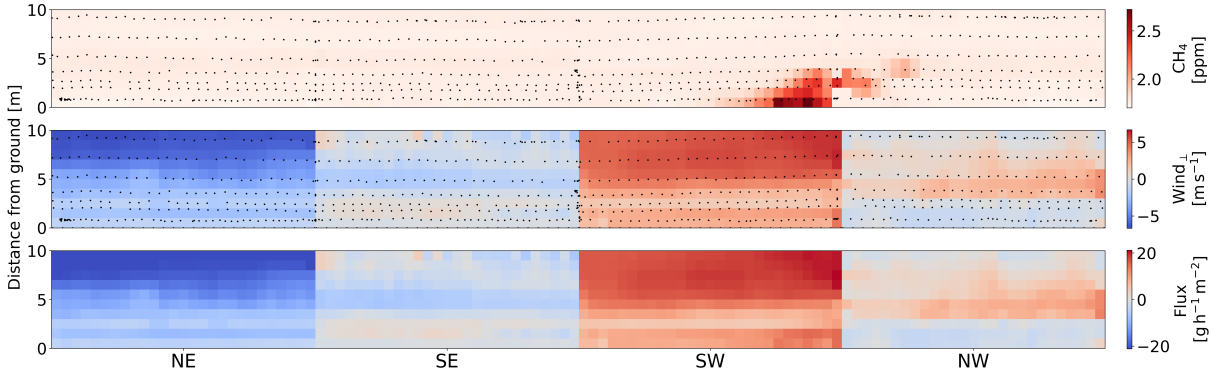

Figure S41. Mass balance method results for pregnant does at 29/02/2024 12:50 UTC + 3 (EAT): $q = 0.8 \pm 2.7\,\mathrm{g\,head^{-1}\,h^{-1}}$. Marked as unreliable result.

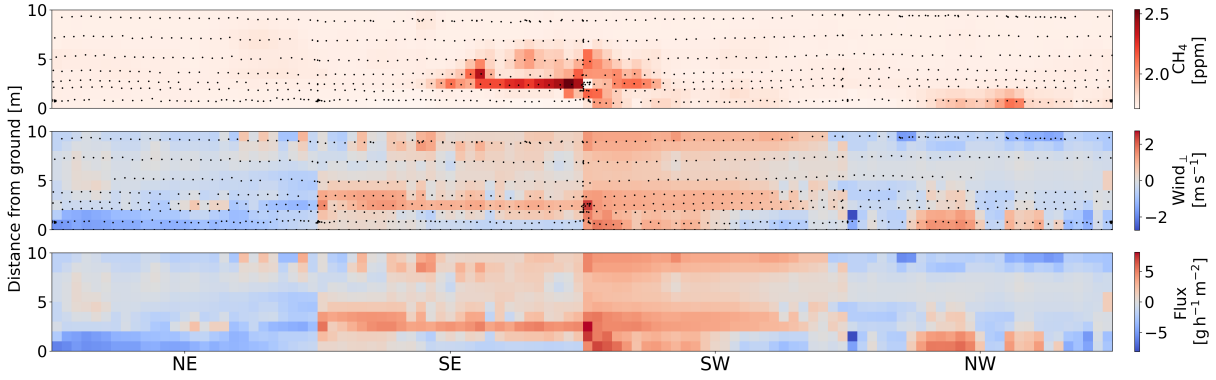

Figure S42. Mass balance method results for pregnant does at 07/03/2024 06:00 UTC + 3 (EAT): $q = 1.7 \pm 1.5\,\mathrm{g\,head^{-1}\,h^{-1}}$. Marked as unreliable result.

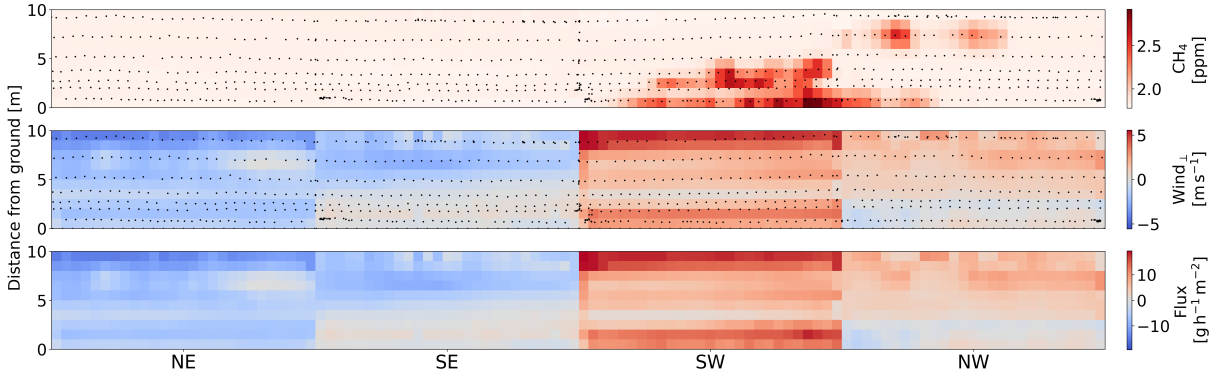

Figure S43. Mass balance method results for pregnant does at 07/03/2024 11:50 UTC + 3 (EAT): $q = 4.2 \pm 1.9\,\mathrm{g\,head^{-1}\,h^{-1}}$. Marked as unreliable result.

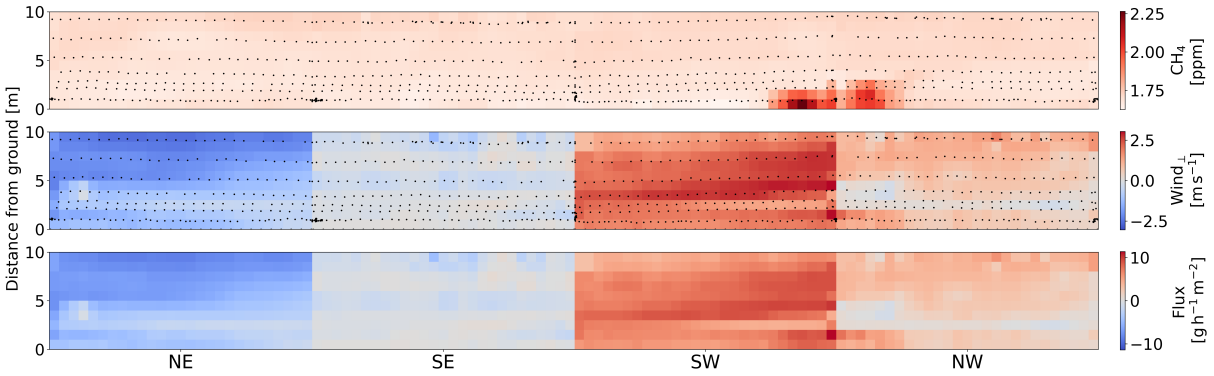

Figure S44. Mass balance method results for weaner kids at 01/03/2024 07:30 UTC + 3 (EAT): $q = 5.0 \pm 1.9\,\mathrm{g\,head^{-1}\,h^{-1}}$. Marked as unreliable result.

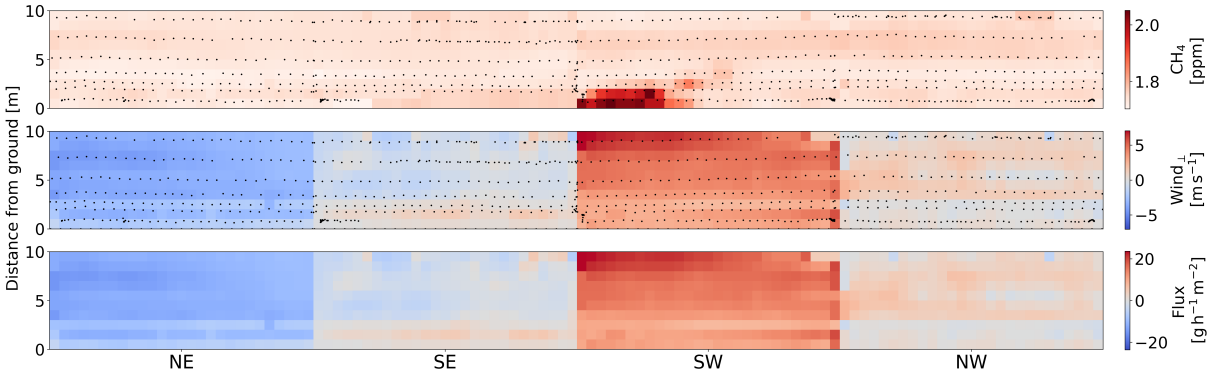

Figure S45. Mass balance method results for weaner kids at 01/03/2024 13:00 UTC + 3 (EAT): $q = 11.1 \pm 2.3\,\mathrm{g\,head^{-1}\,h^{-1}}$. Marked as unreliable result.