

Agscent Air GHG Performance

Validated Against Industry Standards by Leading Research Institutions

Agscent Air GHG technology delivers accurate methane measurement, validated across four leading institutions. The validation program confirms this technology successfully combines laboratory precision with field practicality, giving livestock producers and researchers a reliable tool for emissions monitoring, breeding decisions, and farm management optimisation.

Agscent systems demonstrate consistent correlation of 0.59-0.91 with established measurement methods



Every
Breath Tells
a Story

Summary of validation

Application Area	Technology & Institution	Practical Importance	Key Findings
Herd and Individual Animal Monitoring	Air GHG x Optiweigh <i>Cornell University</i>	Agscent CH ₄ (g/day) measurements showed a stronger correlation with the chamber compared to the GreenFeed™ system and the chamber Reliable performance under controlled research conditions with stronger validation against gold-standard chamber measurements	Agscent CH ₄ (ppm) correlation to chamber (g/day): $r = 0.59$ ($p < 0.01$) Agscent CH ₄ (g/day) with - Chamber: $r = 0.57$ - Feed intake: $r = 0.62$ - Energy Corrected Milk: $r = 0.42$
	Air GHG x Optiweigh <i>University of Sydney</i>	Enables precise individual animal methane profiling for research and management decisions. Strong correlation with established GreenFeed™ technology validates commercial applicability	Agscent CH ₄ (g/day) correlation with GreenFeed™ (g/day): $r = 0.70$ ($p < 0.01$) Agscent CH ₄ (ppm) correlation with - Feed intake: $r \approx 0.50$ - Live weight: $r \approx 0.80$ - Growth rate: $r \approx 0.50$
	Air GHG 2100 <i>Cornell University</i>	Strong correlation of the Agscent CH ₄ measures with chamber methane . Sensor technology comparable to that used in chambers	Agscent CH ₄ (ppm) with chamber measurements: $r = 0.82$
	Air GHG 2100 <i>CSIRO</i>	Enables individual animal methane profiling for research and management decisions	Agscent found animal average correlation Agscent CH ₄ (ppm) with chamber: $r = 0.91$ Agscent CH ₄ (g/day) with chamber: $r = 0.87$
Breeding Programs	Air GHG 2100 <i>CSIRO</i>	Ranking for genetic selection decisions	45% difference in absolute values Maintained similar animal rankings
	Air GHG x Optiweigh <i>Cornell University</i>	Reliable ranking for genetic selection decisions	Maintained similar animal rankings across the 12 animals used
Field Performance	Air GHG x Optiweigh <i>University of Sydney</i>	Robust field deployment under various weather conditions	Minimal weather impact on accuracy Minimal wind speed impact on accuracy
	Air GHG x Optiweigh <i>CSIRO</i>	The measurements align with natural animal behaviour, and the device is capable of capturing temporal variations in methane	143 visits per animal over 4 weeks Higher morning activity consistent with natural animal behaviour
	All trials	Robust field deployment under various weather conditions	Agscent device consistently recorded data every second under a range of environmental conditions

Agscent Air GHG X Optiweigh has been validated against...

GreenFeed University of Sydney

Study Design: Three trials with 20 beef cattle under grazing and pen conditions measured with Agscent Air GHG x Optiweigh and GreenFeed™

Findings: When measured against GreenFeed™, Agscent Air GHG x Optiweigh methane measures demonstrated:

- Significant correlations ($p < 0.001$) between Agscent and GreenFeed technologies with correlation coefficient $r \approx 0.70$
- Strong correlations with **feed intake** ($r \approx 0.50$), **live weight** ($r \approx 0.80$), and **growth rate** ($r \approx 0.50$) measured in the trial

Respiration Chamber Cornell University

Study Design: 12 late-lactation Holstein cows tested across three replicates over three days per system

Findings: When measured against the Respiration Chamber, Agscent's Air GHG x Optiweigh methane measures demonstrated:

- **Moderate Significant correlations ($p < 0.01$)** for CH₄ production (ppm) with chamber CH₄ (g/day): $r = 0.59$
- **Moderate Significant correlations ($p < 0.01$)** for CH₄ production (g/day) with chamber CH₄ (g/day): $r = 0.57$
- **Moderate correlations with feed intake** ($r = 0.62$)

Respiration Chamber CSIRO

Study Design: Four Droughtmaster steers (*Bos indicus* x *Bos taurus*) measured in field conditions using Agscent Air GHG x Optiweigh and in respiration chambers

CSIRO Findings: When measured against CSIRO Respiration Chambers, Agscent Air GHG x Optiweigh methane measures demonstrated:

- underestimation of Methane emission rate

Agscent Findings: Average methane emission (ppm) measured by Agscent Air GHG x Optiweigh demonstrated:

- **Strong correlation ($r = 0.89$)** with Chamber measurements

Agscent GHG 2100 Standalone has been validated against...

Respiration Chamber Cornell University

Study Design: Five-day continuous measurement in respiration chambers through direct chamber integration

Findings: When measured against the Respiration Chamber, Agscent's GHG 2100 demonstrated:

- **Strong significant correlations ($p < 0.05$)** for CH₄ production (ppm) with correlation coefficient $r = 0.82$
- **Strong significant correlations ($p < 0.05$)** for CO₂ production (ppm) with correlation coefficient $r = 0.90$

Respiration Chamber CSIRO

Study Design: Four Droughtmaster steers (*Bos indicus* x *Bos taurus*) measured using sniffer methodology in respiration chambers

CSIRO Findings: When measured against CSIRO Respiration Chambers, Agscent's GHG 2100 demonstrated:

- **45% difference in absolute methane values but maintained consistent animal rankings** for emissions

Agscent Findings: Average methane emission data (ppm) measured by Agscent GHG 2100 demonstrated:

- **Strong correlation ($r = 0.91$)** with Chamber (g/day) measurements

Operational Performance

Agscent GHG 2100 Herd Monitoring Hartpury University

Study Design: Real-time herd monitoring during milking operations using GHG 2100 system

Findings: During milking operations, the Agscent GHG 2100 demonstrated:

- **Significant correlations** with methane amplitude during milking in comparison to total herd emissions

Sensor Performance

Methane Sensor in Agscent Air GHG and Huberg Laser One Sensor

Study Design: Comparative analysis of Methane Sensor in Agscent Air GHG system versus Huberg Laser One (Industry Standard)

Findings: Near-perfect alignment across the entire measurement range, confirming sensor reliability and accuracy

References:

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Reyes, D.C., Senevirathne, N.D., Niu, P., Ramos, V., Pokharel, S., Carnovale, D., Sweeting, A., McFadden, J. W., (2025) Comparison of methods to measure enteric methane emissions in lactating dairy cattle. *J. Dairy Sci.* Vol. 108, Suppl. 1

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