Supplementary Table S1. Summary of GreenFeed visitation frequency in control (CTR) and hyperketonemic (HYK) dairy cows during the experimental period (3–28 DIM). Total cow-days represent the overall observation period, whereas cow-days with valid measurements refer to days included in the calculation of visitation frequency. Mean visitation frequency was calculated by dividing the total number of valid visits by the corresponding number of cow-days.
Individual GreenFeed visits were additionally classified into four 6 h intervals (00:00–05:59, 06:00–11:59, 12:00–17:59, and 18:00–23:59) to characterize their distribution throughout the 24 h period.

Parameter	**CTR (n = 43)**	**HYK (n = 17)**
Total cow-days	1117	442
Total valid visits	2434	958
Cow-days with valid measurements	860	342
Cow-days without valid	257	100
Mean visits per cow-day with ≥1	2.83	2.80
Cow-days with ≥1 valid visit	860 (77%)	342 (77.4%)
Cow-days with ≥2 valid visit	690 (61.8%)	272 (61.5%)

Cow-days with at least one vali d visit represent the dataset eligible for the primary analysis, whereas cow-days with at least two valid visits represent the more restrictive subset considered for sensitivity analysis. These categories are cumulative rather than mutually exclusive. Percentages were calculated relative to the total number of cow-days in each metabolic group.

Time of day	**CTR, n (%)**	**HYK, n (%)**	**Total, n (%)**
00:00–05:59	694 (28.5%)	286 (29.9%)	980 (28.9%)
06:00–11:59	596 (24.5%)	270 (28.2%)	866 (25.5%)
12:00–17:59	644 (26.5%)	198 (20.7%)	842 (24.8%)
18:00–23:59	500 (20.5%)	204 (21.3%)	704 (20.8%)
Total	**2434 (100%)**	**958 (100%)**	**3392 (100%)**

Values are reported separately for control (CTR) and hyperketonemic (HYK) cows. The temporal distribution of visits was evaluated by dividing the 24 h period into four 6 h intervals. Percentages for the temporal distribution were calculated relative to the total number of valid visits within each metabolic group.

Supplementary Table S2. Comparison of milk-yield-adjusted linear mixed-effects models for absolute methane (CH_4), carbon dioxide (CO_2), and hydrogen (H_2) emissions using all available cow-days (≥1 valid GreenFeed visit/day) and a restricted dataset including only cow-days with ≥2 valid GreenFeed visits/day. The table reports the number of cows and cow-days included in each metabolic group (CTR and HYK), estimated between-group differences (HYK − CTR), standard errors (SEs), degrees of freedom (df), and corresponding 95% confidence intervals (CIs). Contrast p-values refer to the specific HYK − CTR comparison, whereas Group-effect p-values refer to the overall effect of the metabolic group in the respective mixed-effects model.

Gas	Model	CTR cows	HYK cows	CTR cow-days	HYK cow-days	Estimated difference (HYK – CTR) g/day	SE	df	95% CI (g/day)	Contrast *p-value*	Group effect *p-value*
CH_4	All available cow-days (≥1 valid visit/day)	43	17	860	342	+163.8	17.01	52	130; 197.5	<0.001	0.039
CH_4	Restricted cow-days (≥2 valid visits/day)	43	17	690	272	+158.4	26.81	48	105.2: 211.6	<0.001	0.012
CO_2	All available cow-days (≥1 valid visit/day)	43	17	860	342	−1182	491.44	52	-2157; -207	0.018	0.007
CO_2	Restricted cow-days (≥2 valid visits/day)	43	17	690	272	−1105	491.44	48	-2080; -130	0.027	0.027

H₂	All available cow-days (≥1 valid visit/day)	43	17	860	342	−1.017	0.189	52	-1.392; -0.642	<0.001	0.009
H₂	Restricted cow-days (≥2 valid visits/day)	43	17	690	272	−0.914	0.289	48	-1.487; -0.341	0.002	0.002