

SUPPLEMENTARY DATA

Supplementary Table 1. Summary of continuous glucose monitor data over the Tour of California

Day	-1	1	2	3	4	5	6	7
In-ride period								
Mean (mmol/L)	-	11.6 ± 3.6	8.4 ± 2.4	9.3 ± 2.6	9.3 ± 1.7	10.8 ± 3.0	9.0 ± 2.7	9.3 ± 2.1
CV (%)	-	13.9 ± 5.1	19.1 ± 8.1	19.6 ± 5.7	16.6 ± 6.4	22.9 ± 13.5	39.4 ± 25.6	12.7 ± 6.6
Incidence hypo	-	0.0 ± 0.0	0.2 ± 0.4	0.0 ± 0.0	0.0 ± 0.0	0.0 ± 0.0	0.4 ± 0.5	0 ± 0.0
Target range (%)	-	41.5 ± 46.8	80.6 ± 28.9	70.5 ± 37.5	69.0 ± 26.1	51.4 ± 39.3	61.8 ± 28.8	65.7 ± 38.5
L1 hypo (%)	-	0.0 ± 0.0	0.6 ± 1.5	0.0 ± 0.0	0.0 ± 0.0	0.0 ± 0.0	5.4 ± 9.1	0.0 ± 0.0
L2 hypo (%)	-	0.0 ± 0.0	0.0 ± 0.0	0.0 ± 0.0	0.0 ± 0.0	0.0 ± 0.0	1.1 ± 2.4	0.0 ± 0.0
L1 hyper (%)	-	28.6 ± 30.0	12.7 ± 19.7	19.2 ± 21.8	26.6 ± 18.8	25.9 ± 15.4	22.5 ± 20.5	41.1 ± 40.9
L2 hyper (%)	-	21.7 ± 32.4	6.1 ± 9.7	10.3 ± 15.9	4.2 ± 10.3	22.7 ± 28.0	12.0 ± 14.3	0.0 ± 0.0
24 h period								
Mean (mmol/L)	7.6 ± 1.7	8.1 ± 1.0	8.6 ± 2.4	8.0 ± 1.8	9.0 ± 1.8	8.6 ± 1.8	7.8 ± 1.4	-
CV (%)	32.5 ± 7.3	35.9 ± 16.3	34.9 ± 11.5	33.8 ± 9.8	29.9 ± 8.8	39.8 ± 12.2	37.6 ± 10.5	-
Incidence hypo	1.0 ± 0.8	1.5 ± 1.5	2.0 ± 1.8	1.8 ± 2.3	1.3 ± 1.6	1.3 ± 0.8	1.8 ± 1.1	-
Target range (%)	72.2 ± 13.0	78.4 ± 16.3	70.4 ± 20.4	70.4 ± 20.1	65.2 ± 21.2	62.1 ± 20.1	68.8 ± 17.0	-
L1 hypo (%)	6.3 ± 8.5	4.0 ± 5.1	4.0 ± 4.1	4.9 ± 5.6	2.2 ± 2.8	5.0 ± 3.5	6.4 ± 4.4	-
L2 hypo (%)	2.4 ± 3.9	0.1 ± 0.1	0.5 ± 0.8	2.7 ± 2.8	1.8 ± 2.2	3.9 ± 6.4	2.5 ± 3.5	-
L1 hyper (%)	14.7 ± 10.1	9.9 ± 7.0	15.0 ± 13.6	16.2 ± 11.3	23.4 ± 13.8	17.1 ± 7.2	18.7 ± 10.4	-
L2 hyper (%)	5.0 ± 5.9	7.6 ± 8.2	10.1 ± 12.3	5.7 ± 8.7	8.9 ± 12.0	11.9 ± 14.5	5.6 ± 6.1	-
Nocturnal Period								
Mean (mmol/L)	7.1 ± 1.8	6.9 ± 1.7	8.7 ± 5.3	6.9 ± 2.8	8.8 ± 2.4	7.7 ± 3.3	7.4 ± 2.2	-
CV (%)	24.6 ± 7.7	22.8 ± 12.4	24.5 ± 6.3	29.8 ± 11.8	34.5 ± 14.5	29.5 ± 13.9	31.3 ± 12.6	-
Incidence hypo	0.5 ± 1.0	0.8 ± 1.6	1.5 ± 1.6	1.5 ± 1.9	0.7 ± 0.8	0.7 ± 0.5	1.2 ± 0.8	-
Target range (%)	79.5 ± 17.4	86.3 ± 17.6	61.6 ± 33.7	63.5 ± 20.9	58.6 ± 30.6	64.6 ± 28.2	66.1 ± 22.7	-

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L1 hypo (%)	8.6 ± 13.2	5.8 ± 12.4	9.3 ± 10.2	10.6 ± 14.0	4.2 ± 6.2	9.0 ± 8.3	11.8 ± 12.5	-
L2 hypo (%)	3.3 ± 6.4	0.0 ± 0.0	0.9 ± 1.7	6.5 ± 7.0	4.4 ± 6.0	5.3 ± 9.9	1.7 ± 3.8	-
L1 hyper (%)	8.5 ± 9.5	4.6 ± 7.1	11.2 ± 12.4	13.8 ± 15.4	20.1 ± 12.0	11.2 ± 17.3	14.5 ± 12.9	-
L2 hyper (%)	0 ± 0	3.3 ± 8.0	16.9 ± 31.5	5.7 ± 10.8	12.6 ± 20.2	9.9 ± 21.3	6.0 ± 13.4	-

The 24h period was defined as 08:00-08:00h; nocturnal period as 22:00-06:00h. Time in range (4-10 mmol/L); level 1 hypoglycemia (3-3.9 mmol/L); level 2 hypoglycemia (<2.9 mmol/L); level 1 hyperglycemia (10-13.9 mmol/L); level 2 hyperglycemia (>13.9 mmol/L). Day -1 indicates the day before the start of racing in the Tour of California. 24 h and nocturnal data were not collected on Day 7 because data collection stopped immediately after the final race. CGM was active (and/or retrievable) for 83±12% of the 24h period over the first 6 days of data collection and 84±18% during the nocturnal periods. To test whether the observed time in different glycemic ranges (see above) were significantly different compared to an ideal distribution based on recent CGM consensus, we applied contingency tables, Pearson's chi-square (χ^2) tests and odds ratios. To account for any low expected frequency (i.e. n<5), Fisher's exact statistics was used. A significant χ^2 test was further broken down with standardized residuals analysis and standardized residuals were interpreted as z-scores (using z=1.96 as a cut-off to establish significance at the 0.05 level). Data are presented as mean + SD.

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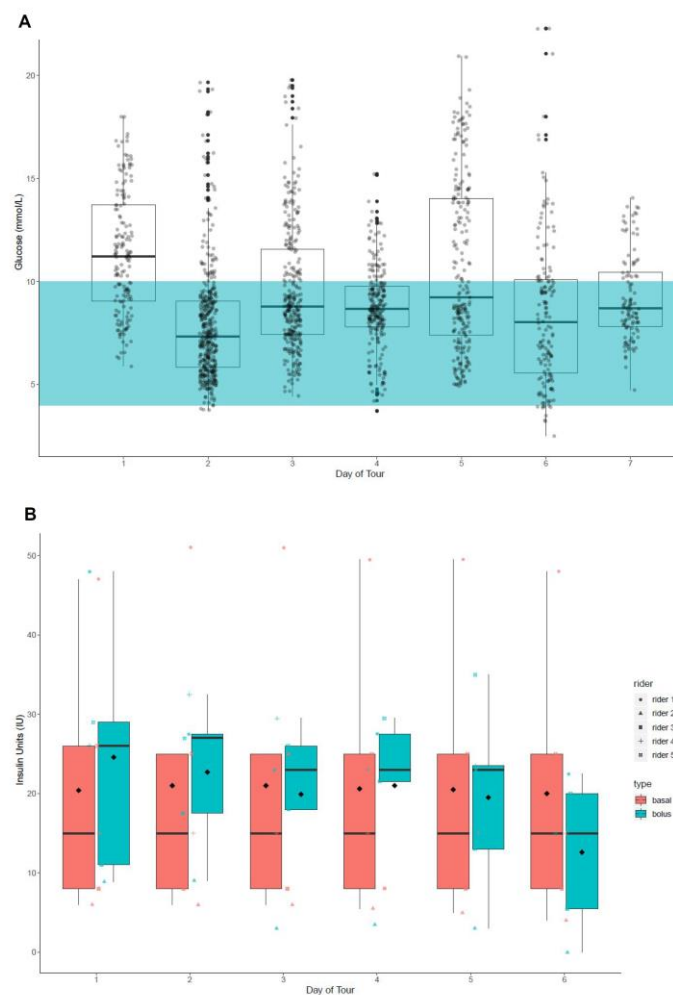
Supplementary Table 2. In-ride nutrition over the 7-day Tour of California

Stage of Tour	1	2	3	4	5	6	7	7-Day average
Total EI (kcal)	1034 ± 324	2138 ± 347	1883 ± 406	2075 ± 253	1528 ± 390	1704 ± 287	1050 ± 545	1630 ± 452
EI (kcal·h ⁻¹)	328 ± 100	339 ± 58	325 ± 70	375 ± 46	326 ± 92	445 ± 104	415 ± 216	365 ± 49
Total CHO (g)	211 ± 60	456 ± 74	384 ± 78	418 ± 46	296 ± 68	376 ± 34	228 ± 109	338 ± 95
CHO (%)	82 ± 7	86 ± 3	82 ± 4	80 ± 2	78 ± 4	89 ± 7	90 ± 14	84 ± 5
CHO (g·h ⁻¹)	67 ± 19	72 ± 12	66 ± 13	76 ± 8	63 ± 16	98 ± 15	90 ± 43	76 ± 13
Total sugar (g)	126 ± 41	299 ± 57	242 ± 43	249 ± 43	169 ± 27	266 ± 19	150 ± 67	214 ± 66
Sugar (%)	49 ± 7	56 ± 6	52 ± 4	48 ± 5	45 ± 8	64 ± 10	62 ± 16	54 ± 7
Sugar (g·h ⁻¹)	40 ± 13	47 ± 10	42 ± 7	45 ± 8	36 ± 6	69 ± 9	59 ± 26	48 ± 12
Total protein (g)	10 ± 6	23 ± 5	27 ± 8	26 ± 7	23 ± 10	15 ± 11	10 ± 8	19 ± 7
Protein (%)	3 ± 2	4 ± 1	6 ± 1	5 ± 1	6 ± 2	3 ± 2	4 ± 1	4 ± 1
Protein (g·h ⁻¹)	3 ± 2	4 ± 1	5 ± 1	5 ± 1	5 ± 2	4 ± 3	4 ± 3	4 ± 1
Total fat (g)	16 ± 10	25 ± 8	30 ± 14	36 ± 8	29 ± 12	18 ± 15	15 ± 15	24 ± 8
Fat (%)	14 ± 6	11 ± 3	14 ± 4	15 ± 2	17 ± 3	9 ± 6	10 ± 8	13 ± 3
Fat (g·h ⁻¹)	5 ± 3	4 ± 1	5 ± 3	6 ± 2	6 ± 3	5 ± 4	6 ± 6	5 ± 1

EI = energy intake; CHO = carbohydrate. Data are presented as mean ± SD

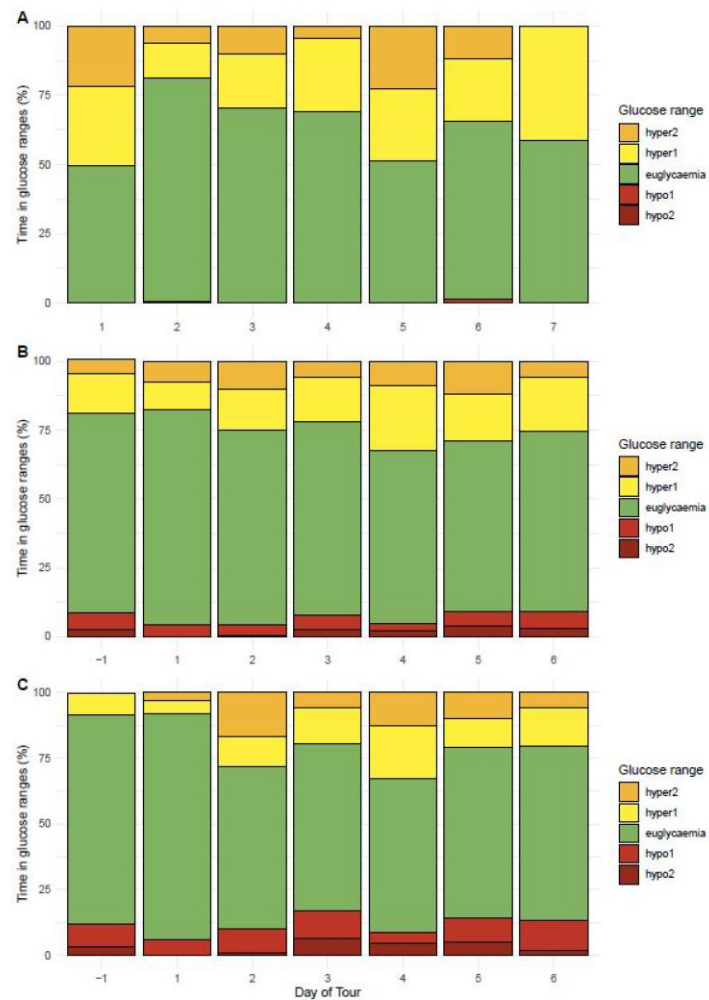
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Supplementary Figure 1. In-ride interstitial glucose levels and insulin doses of the riders over the course of the Tour of California. (A) Whisker Plots (Median with interquartile range and outliers displayed as black dots) are plotted as a function of racing stages among with individual glucose data as grey dots (jitter plot). Blue shaded horizontal area represents the consensus target range of 3.9–10 mmol/L. (B) 24h basal (red) and bolus (blue) insulin dose data for the team over the course of the Tour (mean±SD). Individual basal and bolus insulin dose data are also shown for each individual rider.



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Supplementary Figure 2. Percentage of time in glycaemic ranges over the Tour of California for all of the riders. Bar plots show the relative percentage of time in different glucose ranges (euglycaemia (4-10 mmol/L); Level 1 hypoglycemia (3-3.9 mmol/L); Level 2 hypoglycemia (<2.9 mmol/L); Level 1 hyperglycemia (10-13.9 mmol/L); Level 2 hyperglycemia (>13.9 mmol/L)) as a function of racing days. Panel A shows the continuous glucose monitor (CGM) data for during the races; (B) shows the 24h period which was defined as 08:00-08:00h; and (C) shows the nocturnal period which is defined as 22:00-06:00h. N.B. 24 h and nocturnal data were not collected on Day 7 because data collection stopped immediately after the final race.



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Supplementary Figure 3. Representative plot of in-ride data collected during the Tour of California. Representative in-ride data collected for a rider during Stage 5 of the Tour of California displayed as a function of time (mins). Panel A shows continuous glucose monitoring data (Dexcom G6) with data points every 5 mins (green circles). The grey shading underneath the data indicates target glycemic range (3.9-10.0 mmol/L) and the vertical violet lines indicate when insulin was taken (2 units at the start of the race and 4 units at 180 mins). Panel B shows heart rate data with a moving average curve overlaid to the raw data (red line). Panel C shows raw power output with normalized power displayed as the yellow line. Panel D shows elevation over the course of Stage 5. Box whisker plots are shown in Panels A-C displaying the median along with the inter-quartile range.

