

**Table S1.** Individual values for power output, speed, time-to-completion, and recalculation of time-to-completion.

| ID | Condition | Rider Weight (kg) | Press-on-force (lbs) | Mean Power (W) | Mean speed (km/h) | Time to completion (min) | Mean Speed/Watt (km/h/W) | Recalculated Mean Speed (km/h) | Recalculated time to completion (min) |
|----|-----------|-------------------|----------------------|----------------|-------------------|--------------------------|--------------------------|--------------------------------|---------------------------------------|
| 08 | HD        | 57.2              | 3.20                 | 173.84         | 31.56             | 57.03                    | 0.183                    | 31.87                          | 56.48                                 |
|    | HC        | 94.8              | 3.12                 | 188.26         | 30.53             | 58.96                    | 0.165                    | 34.51                          | 52.16                                 |
|    | KD        | 54.0              | 3.15                 | 148.87         | 29.54             | 60.94                    | 0.200                    | 27.29                          | 65.96                                 |
| 12 | HD        | 83.0              | 4.67                 | 328.31         | 37.38             | 48.15                    | 0.115                    | 37.81                          | 47.60                                 |
|    | HC        | 83.9              | 4.67                 | 355.31         | 39.45             | 45.63                    | 0.112                    | 40.92                          | 43.99                                 |
|    | KD        | 83.9              | 4.43                 | 331.63         | 38.54             | 46.70                    | 0.117                    | 38.20                          | 47.13                                 |
| 14 | HD        | 57.6              | 3.38                 | 162.66         | 30.33             | 59.35                    | 0.188                    | 30.55                          | 58.92                                 |
|    | HC        | 54.9              | 3.17                 | 191.67         | 33.04             | 54.48                    | 0.173                    | 36.00                          | 50.01                                 |
|    | KD        | 54.9              | 3.24                 | 159.31         | 30.19             | 59.62                    | 0.192                    | 29.92                          | 60.16                                 |
| 17 | HD        | 68.9              | 3.01                 | 151.95         | 29.37             | 61.29                    | 0.196                    | 29.71                          | 60.59                                 |
|    | HC        | 68.0              | 3.07                 | 144.29         | 28.38             | 63.41                    | 0.199                    | 28.21                          | 63.81                                 |
|    | KD        | 68.0              | 3.06                 | 131.31         | 27.35             | 65.82                    | 0.208                    | 25.67                          | 70.12                                 |
| 28 | HD        | 68.9              | 2.87                 | 123.60         | 25.55             | 70.46                    | 0.210                    | 25.98                          | 69.30                                 |
|    | HC        | 67.9              | 2.71                 | 118.88         | 25.58             | 70.36                    | 0.217                    | 24.98                          | 72.05                                 |
|    | KD        | 68.0              | 2.75                 | 88.87          | 21.60             | 83.33                    | 0.2443                   | 18.68                          | 96.38                                 |

Table S2. Speed-per-watt comparisons.

|                   | Power (W) | Formula                | Speed/Watt (km/h/W) | Calculated time to completion (min) |
|-------------------|-----------|------------------------|---------------------|-------------------------------------|
| High Carbohydrate | 150       | $y = 4.1121x^{-0.61}$  | 0.193485            | 62.02                               |
| Ketogenic         | 150       | $y = 5.6561x^{-0.676}$ | 0.1912              | 62.76                               |
| Road model        | 150       | $y = 4.0696x^{-0.601}$ | 0.200318            | 59.90                               |

**Table S3.** Inferential statistics for different analysis options.

| Outcome and model          | <i>Numerator<br/>DF</i> | <i>Denominator<br/>DF</i> | <i>F</i> | <i>p</i> |
|----------------------------|-------------------------|---------------------------|----------|----------|
| Time to completion         |                         |                           |          |          |
| Linear mixed-effects model | 2                       | 34                        | 6.06     | 0.006    |
| RM-ANOVA                   | 2                       | 34                        | 6.06     | 0.006    |
| ANCOVA (Baseline)          | 1                       | 33                        | 533.29   | <0.001   |
| ANCOVA (Condition)         | 1                       | 33                        | 8.12     | 0.007    |
| Carbohydrate oxidation     |                         |                           |          |          |
| Linear mixed-effects model |                         |                           |          |          |
| Condition                  | 2                       | 69                        | 118.18   | <0.001   |
| Time                       | 4                       | 69                        | 6.86     | <0.001   |
| Condition x Time           | 8                       | 69                        | 1.18     | 0.326    |
| RM-ANOVA                   |                         |                           |          |          |
| Condition                  | 2                       | 8                         | 100.76   | <0.001   |
| Time                       | 4                       | 16                        | 4.02     | 0.019    |
| Condition x Time           | 8                       | 32                        | 1.54     | 0.184    |

DF = degrees of freedom; RM-ANOVA = repeated measures analysis of variance;  
ANCOVA = analysis of covariance; Baseline = Time from time trial in habitual condition

**Table S4.** Estimated mean differences (EMD) for time to completion between conditions

| Comparison and model          | <i>DF</i> | <i>t</i> | <i>EMD</i> | <i>95%CI</i> | <i>p</i>     |
|-------------------------------|-----------|----------|------------|--------------|--------------|
| Habitual – High Carbohydrate  |           |          |            |              |              |
| Linear mixed-effects model    | 34        | 1.99     | 1.28       | -0.34, 2.90  | 0.109        |
| RM-ANOVA                      | 17        | 3.07     | 1.28       | 0.18, 2.39   | <b>0.021</b> |
| ANCOVA                        | -         | -        | -          |              | -            |
| Habitual – Ketogenic          |           |          |            |              |              |
| Linear mixed-effects model    | 34        | -1.48    | -0.95      | -2.57, 0.67  | 0.149        |
| RM-ANOVA                      | 17        | -1.37    | -0.95      | -2.79, 0.89  | 0.187        |
| ANCOVA                        | -         | -        | -          | -            | -            |
| High Carbohydrate - Ketogenic |           |          |            |              |              |
| Linear mixed-effects model    | 34        | -3.47    | -2.23      | -3.86, -0.61 | <b>0.004</b> |
| RM-ANOVA                      | 17        | -2.90    | -2.23      | -4.28, -0.19 | <b>0.021</b> |
| ANCOVA                        | 33        | 2.85     | -2.23      | -3.83, -0.64 | <b>0.007</b> |

DF = degrees of freedom;

RM-ANOVA = repeated measures analysis of variance; ANCOVA = analysis of covariance;