INSCYD - The Origin of Performance
INSCYD.com
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360° Metabolic Profile

This is your complete performance testing report.

The following pages contain all the significant information about your current state of performance..

Test Id	174135876433
Date	06.03.2023
Sport	Running
Test Type	LACTATE
Athlete	Male II Runner
Coach	

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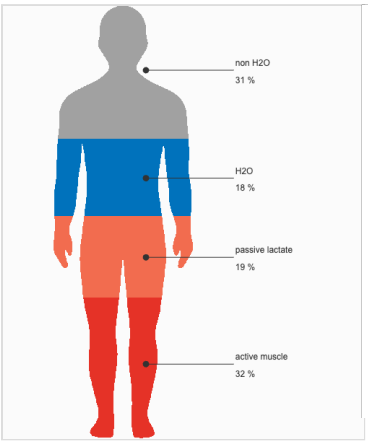
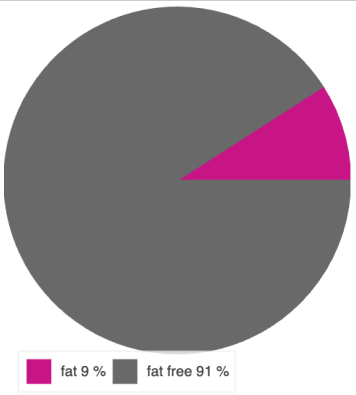
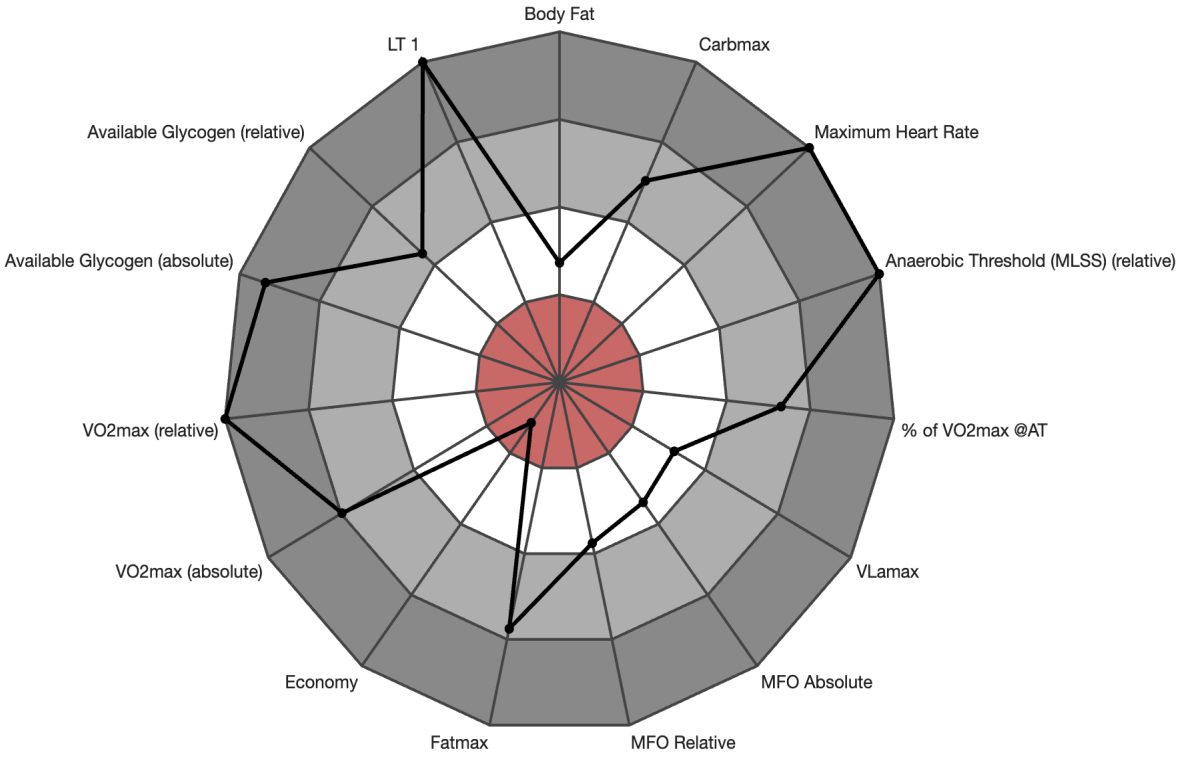
Body Composition





Body Mass	71.4 kg
Body Height	186.0 cm
Body Mass Index	20.6 kg/m2
Projected BSA	1.927 m2
Body Fat	9.1 % of body mass / 6.5 kg
Fat Free	90.9 % of body mass / 64.9 kg

Metabolic Fingerprint



This graph visualizes your metabolic profile at a glance. The most important performance metrics are shown and benchmarked. The further outside a metric is, the higher your personal value is compared to a peer comparison group. This comparison group is based on: gender, your sport, and your category as an athlete (pro, amateuer, recreational or custom groups created by your coach). Please note that this is not a ranking in terms of good or bad, but an analysis of your physiological phenotype. For example: your VLamax (glycolytic power) may be ranked low, but if you are an endurance athlete this is maybe exactly what you want. And if you are more a sprint style athlete, you maybe should not be concerned if your FatMax values aren't ranked high. Therefore this graph needs to be understood as a fingerprint of your current physiological profile, not as a ranking of good or bad.

Physiological Performance Benchmarks

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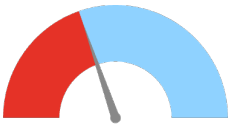
VO2max - maximum aerobic power

Absolute: **5059** ml/min
Relative: **70.85** ml/min/kg

VLamax - maximum glycolytic power

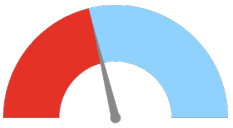


VLa_{max}: **0.36** mmol/l/s

AT - Anaerobic Threshold (MLSS)

MLSS: **03:06** min:sec/km
MLSS: **5.36** m/s
$\%VO2_{max}$: **86.4** %

Fatmax - maximum fat metabolism

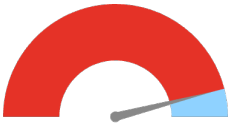


MFO Absolute: **611** kcal/h
MFO Relative: **8.56** kcal/h/kg
Fat_{max}: **04:46** min:sec/km

Carbmax - carbohydrate metabolism

$Carb_{max}$: **04:22** min:sec/km
$Carb_{max}$: **3.81** m/s

Available Glycogen g/kg



Absolute: **554** g
Relative: **7.76** g/kg

LT 1

LT1: **04:13** min:sec/km

Heart Rate

Maximum: **220** bpm

VO2max: is a proxy for your aerobic power. The maximum rate of oxygen uptake is proportional to the maximum energy production in the aerobic metabolism. In almost all sports it is desirable to have a high VO2max, enabling a high power production by aerobic metabolism.

VLamax: a proxy for your glycolytic (anaerobic) power. The maximum rate of lactate production is proportional to the maximum energy production in the glycolytic (anaerobic) metabolism of your muscles. For endurance events, such as an Ironman, or a Marathon, a low VLamax is desirable. In events which include sprinting or short intense bouts, a higher VLamax is associated with higher performance.

Anaerobic threshold (AT) AKA maximum lactate steady state (MLSS). MLSS marks the intensity (speed or power) at which the production rate of lactate in the muscle equals the clearance rate of lactate. AT marks the highest possible intensity, which can be sustained without accumulating lactate.

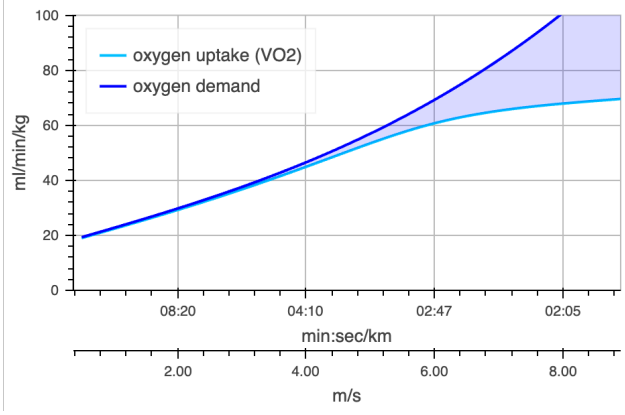
FatMax marks the highest fat oxidation rate. Simplified, this is the maximum amount of energy (kcal) from fat combustion per hour.

CarbMax marks the intensity (speed or power) at which the combustion of carbohydrates reaches 90g per hour.

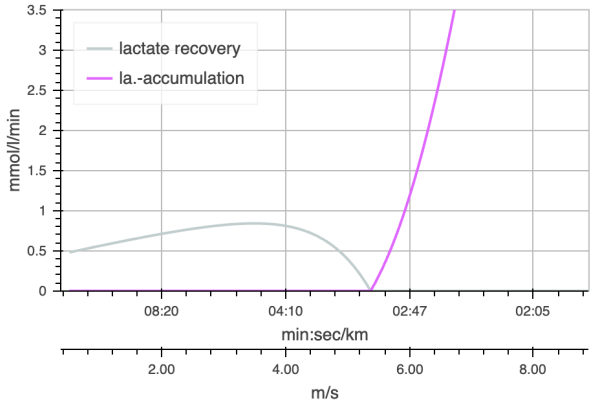
Load Characteristics

Work only related steady state characteristics of key physiological metrics

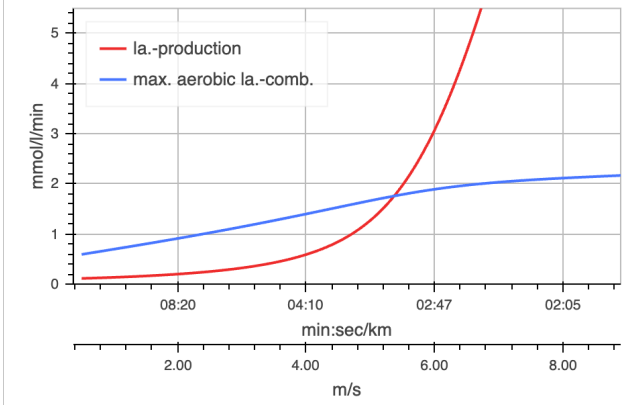
Metabolic demand & VO2



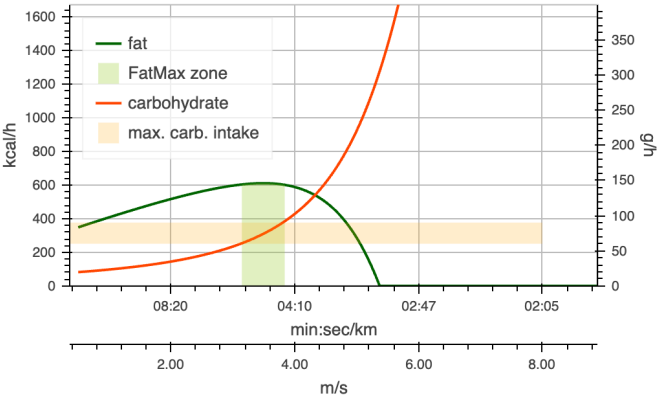
Lactate: recovery & accumulation



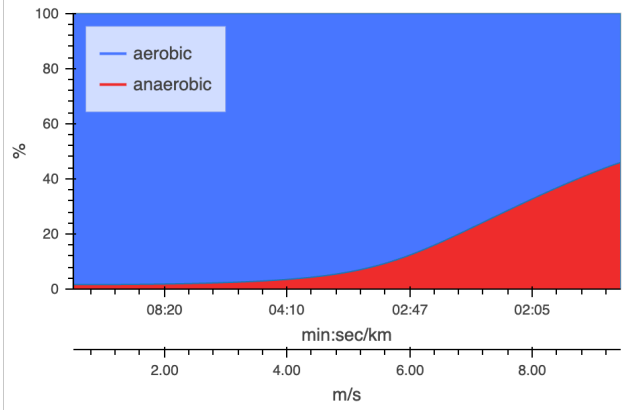
Lactate – production & max. oxidation



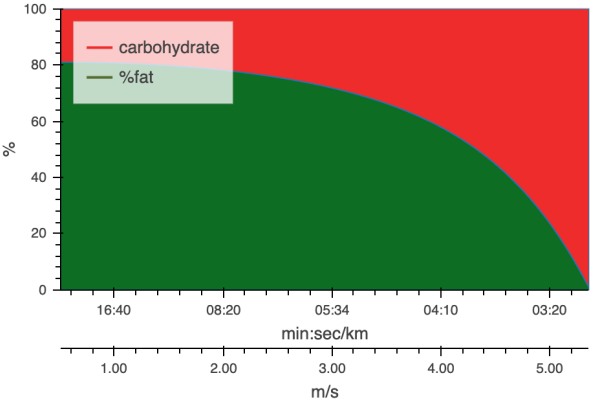
Fat & carbohydrate combustion



% Aerobic & Anaerobic



% Fat & Carbohydrate



The relationship between oxygen demand (dark blue) and the exercise intensity (speed or power) is a marker for the economy or efficiency. The lower the oxygen – read energy – demand for a given intensity, the better.

The light blue curve shows the actual oxygen uptake (VO2) in steady state conditions. When compared to the oxygen demand it becomes visible how much of the energy demand is covered by aerobic metabolism. The gap between the two is shown as the light blue area which needs to be covered by glycolytic metabolism.

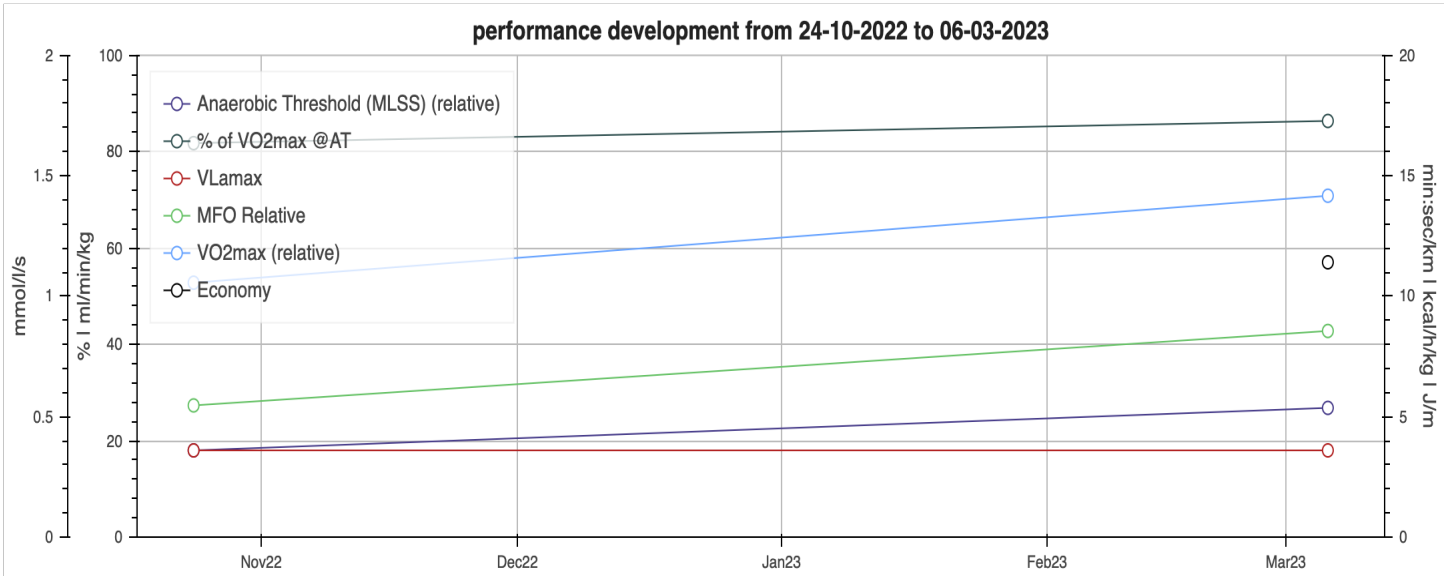
Lactate production & combustion: during exercise the amount of lactate which can be be cleared is limited by the oxygen uptake (“max. aerobic lactate combustion” curve, blue). The red “lactate production“ curve shows the actual lactate production per minute. Look for the crossing point of the lactate production (red) and the lactate combustion (blue) – this is intensity of anaerobic threshold or maximum lactate steady state.

The curve in the top right graph shows your ability to combust lactate (“lactate recovery”, grey), for example after a short hard bout of exercise. The higher the curve and the further the apex is to the right, the faster the recovery at a higher intensity is possible.

The purple curve shows the rate of lactate accumulation at intensities above MLSS. The steeper the curve, faster lactate accumulation at any given intensity.

The green curve shows the rate of fat combustion in kcal/h (left y-axis). The intensity at which the energy derived from fat combustion is the highest is marked with a green area (“FatMax zone”). In the same graph the rate of glucose combustion is visualized (red): in kcal/h on the left y-axis, and in gram/hour on the right Y-axis. Note that a range of 60-90g/h is marked orange, as this marks the typical range of possible combustion of exogenous carbohydrates (from solid food, gels and/or drinks).

Performance Development



The graph above aggregates this assessment, and all previous test data. The most relevant performance metrics are displayed here. You can see how each metric develops over time.

Review your training diary to compare the training you have completed in between tests, and see which adaptations, specific training methods have triggered.

Test Data - graphs

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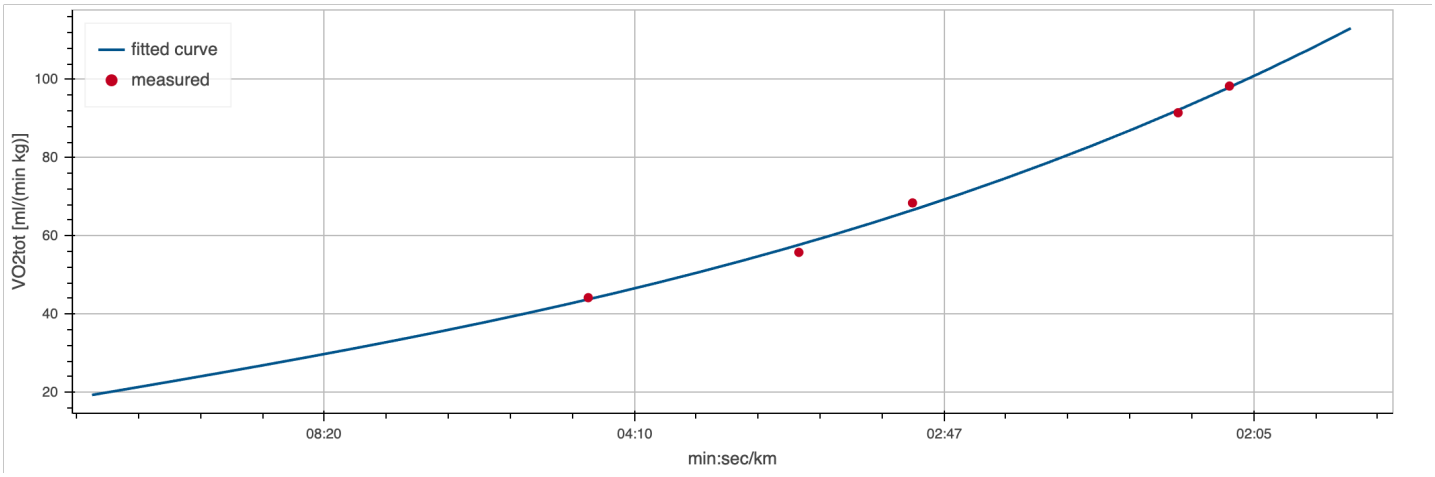
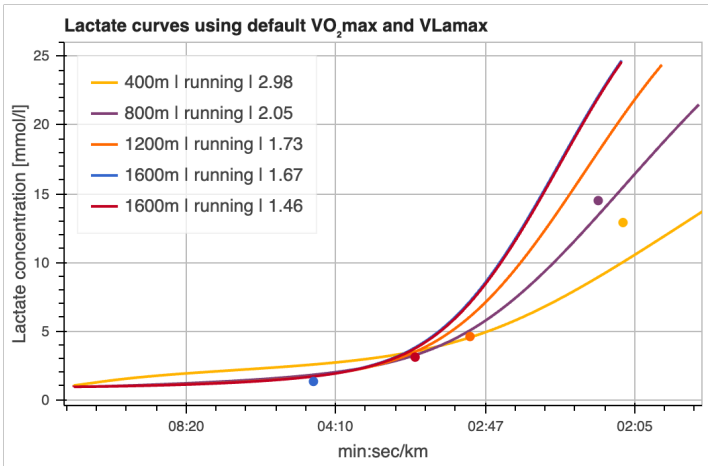
Determination of metabolic demand

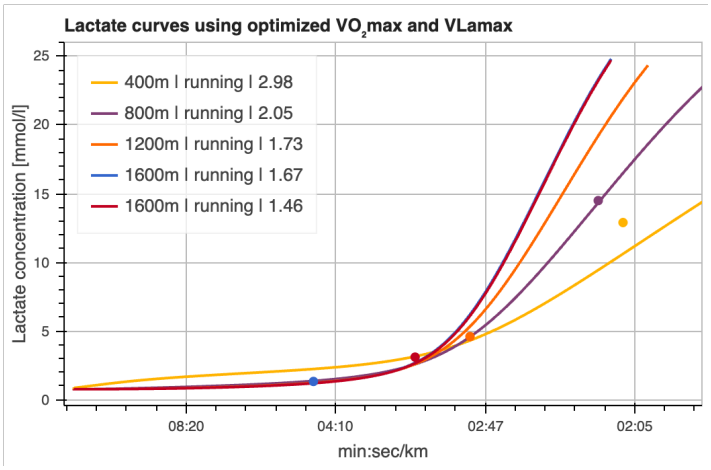
Sum of squared errors is 7.76



Determination of lactate accumulation

Sum of squared errors before optimization: 15.84 , after optimization: 8.44





The graph and table above show the actual test data as measured.

You can see the measured values for each test and time duration plotted as dots.

The lines show the fitted curves to the actual measured values. The better the fitting, the higher the accuracy of the test.

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Test Data - tables

Measured Values							
Run	Distance [m]	Time [mm:ss]	Pace [min:sec/km]	Max Lactate [mmol/l]	Heart rate [bpm]	VO2 [ml/min/kg]	Condition
1	1600	07:12	04:30	1.3	0	44.30	-
2	1600	05:16	03:17	3.1	0	54.90	-
3	1200	03:27	02:52	4.6	0	66.10	-
4	800	01:46	02:13	14.5	0	72.00	-
5	400	00:51	02:07	12.9	0	65.90	-

Calculated Values						
Run	VO2tot [ml/min/kg]	% aerobic [%]	% anaerobic [%]	Economy [ml/min/kg /m/s]	% MLSS [%]	% VO2max [%]
1	44.17	90.2	9.8	11.93	72.2	62.34
2	55.76	84.8	15.2	11.01	91.1	78.70
3	68.41	75.6	24.4	11.80	111.8	96.56
4	91.48	58.6	41.4	12.18	149.5	129.12
5	98.31	45.7	54.3	12.53	160.7	138.76

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Training Zones

Zone	Code	Lower		Upper		Target		Physiological Conditions				
Recovery	rec	Pace **06:32** [min:sec/km]	Pace **10:31** [min:sec/mile]	Pace **04:50** [min:sec/km]	Pace **07:47** [min:sec/mile]	Pace **05:25** [min:sec/km]	Pace **08:43** [min:sec/mile]	Total Energy **845** [kcal/h]	Fat **71** [%]	Fat **63** [g/h]	Carbohydrates **29** [%]	Carbohydrates **58** [g/h]
Base	bas	Pace **05:19** [min:sec/km]	Pace **08:34** [min:sec/mile]	Pace **04:36** [min:sec/km]	Pace **07:24** [min:sec/mile]	Pace **04:54** [min:sec/km]	Pace **07:53** [min:sec/mile]	Lactate con. **1.1** [mmol/l]	Fat **68** [%]	Fat **64** [g/h]	Carbohydrates **32** [%]	Carbohydrates **70** [g/h]
Medio	med	Pace **03:55** [min:sec/km]	Pace **06:18** [min:sec/mile]	Pace **03:27** [min:sec/km]	Pace **05:33** [min:sec/mile]	Pace **03:40** [min:sec/km]	Pace **05:54** [min:sec/mile]	VO2max **70** [%]	Lactate con. **1.8** [mmol/l]	Total Energy **1124** [kcal/h]	Carbohydrates **153** [g/h]	
FatMax	Fat	Pace **05:17** [min:sec/km]	Pace **08:30** [min:sec/mile]	Pace **04:22** [min:sec/km]	Pace **07:02** [min:sec/mile]	Pace **04:47** [min:sec/km]	Pace **07:41** [min:sec/mile]	VO2max **57** [%]	Total Energy **920** [kcal/h]	Fat **65** [g/h]	Carbohydrates **74** [g/h]	FatMax **100** [%]
Anaerobic Threshold	AT	Pace **03:20** [min:sec/km]	Pace **05:22** [min:sec/mile]	Pace **02:55** [min:sec/km]	Pace **04:42** [min:sec/mile]	Pace **03:06** [min:sec/km]	Pace **05:00** [min:sec/mile]	VO2max **80** [%]	Lactate acc. rate **0.0** [mmol/l/min]	Total Energy **1276** [kcal/h]	AT **100** [%]	
Aerobic Maximum	AeM	Pace **02:44** [min:sec/km]	Pace **04:23** [min:sec/mile]	Pace **02:31** [min:sec/km]	Pace **04:03** [min:sec/mile]	Pace **02:37** [min:sec/km]	Pace **04:13** [min:sec/mile]	VLamax **19** [%]	Total Energy **nc** [kcal/h]	Energy con aerobic **84.3** [%]	Energy con anaerobic **15.7** [%]	
High Anaerobic	Aen	Pace **02:17** [min:sec/km]	Pace **03:41** [min:sec/mile]	Pace **02:01** [min:sec/km]	Pace **03:15** [min:sec/mile]	Pace **02:09** [min:sec/km]	Pace **03:28** [min:sec/mile]	VO2max **95** [%]	VLamax **48** [%]	Lactate acc. rate **8.3** [mmol/l/min]	Energy con aerobic **69.9** [%]	Energy con anaerobic **30.1** [%]
Lactate Shuttling	LaS	Pace **04:47** [min:sec/km]	Pace **07:41** [min:sec/mile]	Pace **02:50** [min:sec/km]	Pace **04:34** [min:sec/mile]							