

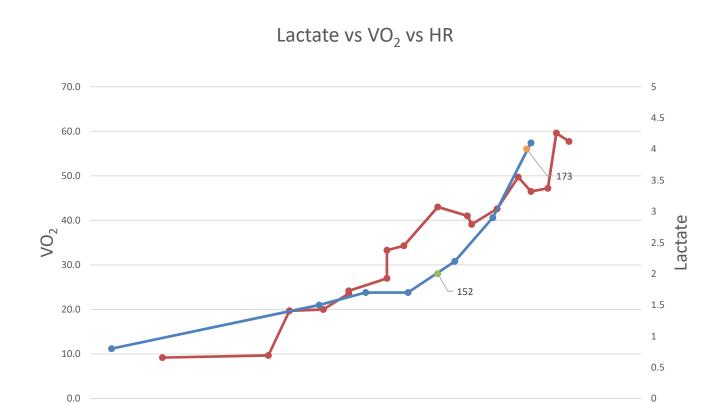
Name:	Steve Rogers		Sex:	Male	Date: 5/12/2023			
Physical Characteristics								
Age (yr)	3	33						
Height (in)			68.8					
Mass (lb)			164.5					
Maximal Data								
VO _{2max} (I/min)			4.	4.46				
VO _{2max} (ml/kg/min)			59	59.6				
Heart Rate (bpm)			1	183				
Submaximal Data	Heart Ra	Heart Rate (bpm)		Power Output (Watts)				
Lactate Threshold 1	1:	152		150				
Lactate Threshold 2			1	173		200		
Aerobic Base			1:	123		100		
Anaerobic Threshold			174		200			
		T	raining Z	ones	•			
7					es/min Power (watts)			
1		87	123	3.3	7.1	50	100	
2		124	142	7.3	12.2	100	140	
3		143	174	12.7	18.8	140	200	
4		175	180	19.5	21.2	200	220	
5		181	183	22.3	2112	220+		
	VO2 N		ns for Mei		min)*			
Percentile			20-29	30-39	40-49	50-59	60-69	
95	Superior		≥ 58.5	≥ 44.7	≥ 41.9	≥ 37.4	≥ 32.4	
90	Excellent		55.5	41.7	37.1	34	29.9	
85			53.9	38.1	34.9	32.1	27.8	
80			51.4	36.2	34.2	30.7	26.7	
75	Good		49.5	35	31.8	29.3	25.5	
70			47.9	33.9	30.4	28.2	24.5	
65			46	31.8	29.3	27.1	24	
60			44.5	31.1	28.6	26.3	23.2	
55				30.7	28	25.7	22.9	
50	Fair		41.9	30.1	27.1	24.8	22.4	
45			40.2	29.4	26.2	24.2	21.9	
40			38.3	28.1	25.4	23.6	21.4	
35		Poor		27.5	24.9	23	21	
30	Pr			26.9	24	22.6	20.2	
25	. 55.		34.7 33.2	26.2	22.9	22.1	19.7	
20				25.4	22.2	21.5	19	
15		Very Poor		23.9	21.6	20.8	18.4	
10	Very			21.8	20.6	20.4	17.3	
5				≤ 19.3	≤ 18.9	≤ 18.1	≤ 15.3	
*American College of Sports Me	dicine, 2022							



90

110

70



Lactate is a by-product of metabolism and serves as an indirect marker of muscular fatigue during exercise. The lactate that is produced during normal and exercise metabolism is generally removed from the blood under low-intensity activities. As the intensity and duration of the activity increases, the rate of lactate production begins to exceed the rate of lactate removal from the blood, and it is this increased concentration of blood lactate that can lead to fatigue.

130

Heart Rate

Lactate

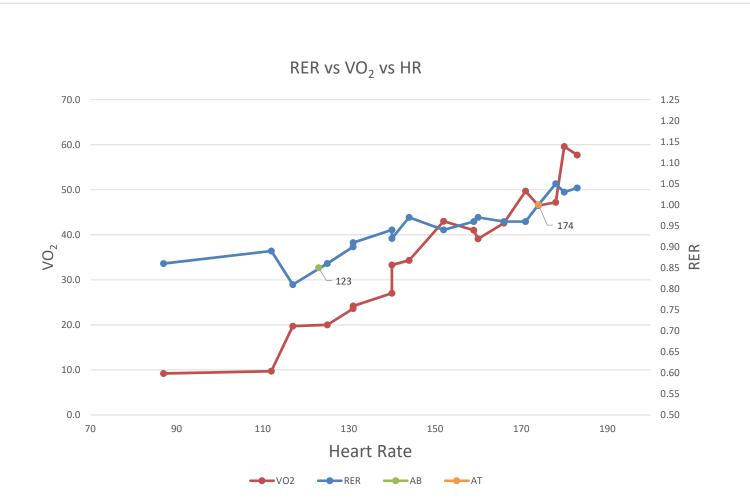
150

170

190

This test measured the concentration of lactate in the blood to be able to determine your Lactate Threshold 1 (LT1) and your Lactate Threshold 2 (LT2). LT1 is often defined as the lowest intensity where there is a sustained increase in blood lactate concentration above resting levels. LT1 is often identified when blood lactate concentration reaches 2.0 mmol/L. This is also commonly referred to as your aerobic threshold (AeT) and is an exercise intensity that can be maintained for 60 minutes or more. LT2 is often identified when blood lactate concentration reaches 4 mmol/L. This is commonly referred to as your anaerobic threshold (AT) and is when blood lactate concentration will continue to rise rapidly. Exercise intensities above LT2 cannot be sustained for very long.



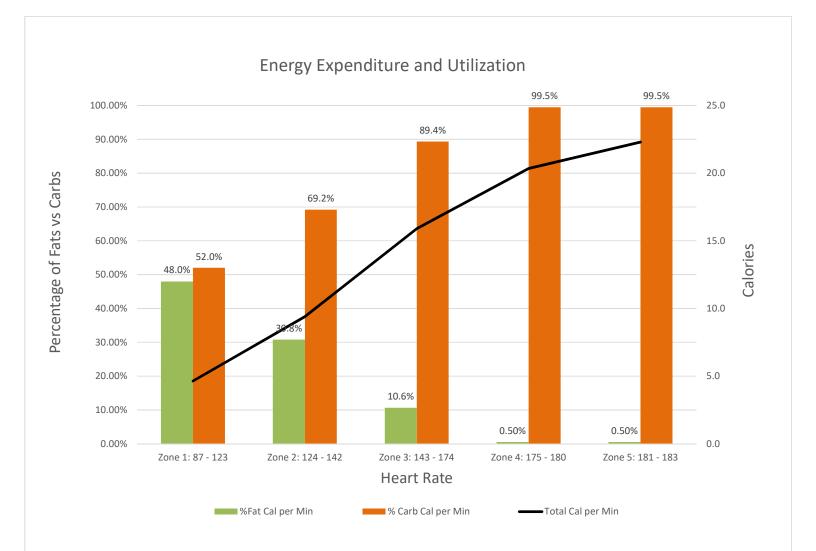


This graph displays your respiratory exhange ratio (RER) plotted agains VO₂ and heart rate. RER is the ratio of oxgyen taken up by your muscles and carbon dioxide produced as a byproduct of metabolism during exercise. RER is an important measure because it can identify if the body is working aerobically (with oxygen) or anaerobically (without oxygen) at different exercise intensities. RER also reflects what substrate (Fat, Carbohydrate, Protein) the muscle is using to produce energy during exercise. An RER of 0.70 indicates the body is burning almost exclusively fat (aerobic), while an RER of 1.0 indicates the body is burning almost exclusively carbohydrates (anaerobic).

Aerobic Base (AB) is identified by an RER of 0.85, and indicates that they body is moving from primarily aerobic metabolism to more anaerobic metabolism. Anaerobic Threshold (AT) is identified by an RER of 1.0, and indicates the body is using anaerobic energy metabolism exclusively.

Through specific training it is possible to shift the AT closer to maximum heart rate and shift AB closer to AT resulting in improved cardiorespiratory endurance.





This graph displays how your body "burns" calories at different heart rate ranges. During exercise, as your heart rate increases the total number of calories expended also increases. However, the percentage of calories expended from fat decreases.

The myth of the "fat burning zone": As you can see here, the body generally burns a higher percentage of calories from fat at very low intensities. This is what is commonly referred to as the fat burning zone. Although a higher percentage of calories expended may be coming from fat, the total number of calories burned is very low. Additionally, exercising at very low intensites will decrease overall exercise capacity, or VO_{2MAX} decreasing the body's ability to burn calories and fat.

Through proper cardiorespiratory training, it is possible to increase the percentage of fat calories burned at higher exercise intensities that will result in improved endurance and body composition.