

25m versus 50m pool lengths

Lets look at the effect of pool length and swimming velocities. All of the world, coaches have adapted both 25m and 50m swimming for training and even for competitions. We see faster speeds in short course events than long course and it is mainly due to the extra turns one gets in the short course events. Lowesensten et.al (1994) found that the extra turns in the short course events has many advantages including increased speed after each turn and a period of inactivity after each turn. Both of these produces a decrease in lactate concentration in blood and muscle and also lowers the heart rate of the swimmer.

Keskinen and Mero (2007) from Finland have studied the effects of pool length and its relationship to blood lactate level and heart rate. The research article is published in the International Journal of Sports Medicine.

According to the research study, they observed that the maximum intensity swims produces significant differences in Blood lactate and swim velocities between short course and long course swimming. They did not find any difference in HR (Hear Rate) in the two pool length swims. Another study by Wirtz demonstrated that swimmers could swim faster in short course pool due to the effect of reaching higher velocity after each turn.

So what is blood lactate and how does it affect the swim? The actual concentration of blood lactate is the amount of lactate in the blood and it is due to the diffusion form the working muscles. The study explained that the difference between the two course swims was due to the frequency of turns that produces incremental physiological response. For e.g. a 200m freestyle swim has 8 turns in short course pool and 4 times more than a long course pool. What does this mean? This means that there is a shorter stroke distance per pool length and the whole swim in a shorter pool length compared to long course swims. In their study, they found that each swimmer would spend 6secs of their swim per pool length in turning and gliding. Whereas in a 50m-pool length, a swimmer will spend around 9-18secs in turning and gliding compared to 21-42 secs in a shorter course. By having more time in turning and gliding, a shorter course will produce relative inactivity for upper body muscles produces a relative recovery state for the muscles. This gives time for the:

- 1.Increased lactate clearance from the muscles
- 2.Decreased lactate production from these muscles and also
- 3.Increased lactate uptake by less active muscles.

It was also demonstrated that even this short period of recovery would allow for partial replenishment of creatinine stores in those muscles and myoglobin oxygen stores. Even though the course plays a major part, one has to keep a note that the swimmer's nutritional state, his training and recovery phases should be accounted.

The study also demonstrated that HR was higher in a long course swim than a short course swim. HR is influenced by temperature of the water and environment, time since the last meal and previous activities. While training in a 25m pool seems less strenuous than in 50m pool, it is always advised to train in a 50m pool too in order to get more accustomed to more strenuous competitive situations. According to the study, they demonstrated that swimmers training in shorter course are at a clear disadvantage when competing in 50m pools because they are unaccustomed to both higher blood lactate levels and are more susceptible to lactate related muscle fatigue. But previous studies have demonstrated that practicing in shorter course pool will provide the swimmer an opportunity to develop their swim stroke to fit with a higher swimming velocity and an efficient stroking.

In conclusion, pool lengths affect Lactate levels and HR when the swimmer swims at a constant intensity and distance. A shorter stroking distance in a 25m pool compared with a 50m pool with extra turns has a clear advantage. But when they compete in long course meets, they are at a disadvantage. Hence practicing both in 25m and 50m pool lengths will make a swimmer achieve his stroking pattern and also acclimatized to physiological response to swim faster in swim meets.

Journal Article: Keskinen, O.P, Keskinen, K.L, & Mero, A.A.(2007). Effect of Pool Length on Blood Lactate, Heart Rate and Velocity in Swimming. International Journal of Sports Medicine, 28:407-413.