INTRODUCTION: Lactate metabolism and kinetics in running depend on the length of track covered in a given running event, and have been shown to be related to performance. The aim of this study was to compare peak and recovery blood lactate parameters, measured after an all-out treadmill ramp test, between runners competing in different running events.

METHODS: The sample consisted of 48 male runners: 10 sprinters (S, 20.5+/-3.0 yrs, 184.9+/-4.8 cm, 76.6+/-4.4 kg), 15 400m runners (400R, 20.0+/-3.5 yrs, 180.9+/-4.2 cm, 73.0+/-6.3 kg), 10 middle distance runners (MD, 18.7+/-2.3 yrs, 180.4+/-5.7 cm, 68.6+/-6.2 kg), and 13 long distance runners (LD, 27.0+/-5.9 yrs, 179.1+/-6.7 cm, 69.5+/-7.0 kg). All subjects performed an all-out incremental running test on a treadmill (starting speed 8 km/h with 1km/h increments every minute, at a constant inclination of 1.5%). Finger-tip capillary blood lactate concentration was measured at the end of the 1st, 3rd, and 5th minute of recovery (La1, La3, La5). The highest of the three readings was considered as the peak blood lactate concentration (Lapeak).

RESULTS: Maximal speeds achieved in the test were as follows: 17.2+/-1.4 km/h (S), 19.5+/-0.8 km/h (400R), 21.4+/-1.1 km/h (MD) and 21.7+/-1.4 km/h (LD). S showed the highest values of Lapeak (15.1+/-2.7 mmol/L), followed by 400R (14.0+/-1.4 mmol/L) and MD (13.7+/-2.9 mmol/L). The Lapeak in LD was significantly lower than in all other groups (10.9+/-2.4 mmol/L, p<0.05), while no significant differences were present between S, 400R, and MD. The mean time to reach peak blood lactate concentration (tLa-peak) was the shortest in S (1.2+/-0.6 min), followed by LD (1.5+/-0.9 min), MD (1.8+/-1.4 min), and 400R (1.9+/-1.5 min); however, the differences did not reach statistical significance (p>0.05). The lactate mean values showed the same trend (La1>La3>La5) in all 4 groups: S (15.0+/-2.9, 13.6+/-2.3, and 12.7+/-2.5 mmol/L), 400R (13.8+/-1.5, 13.1+/-1.7, 12.5+/-1.9 mmol/L), MD (12.8+/-3.5, 12.2+/-2.4, 11.4+/-3.13 mmol/L), and LD (10.6+/-2.5, 10.1+/-2.7, 9.0+/-2.3 mmol/L).

CONCLUSIONS: In an all-out ramp treadmill test of 10-15 minutes duration, runners show a trend towards higher La-peak values, the shorter the track length covered in their specific event is. However, only long-distance runners show statistically significantly lower La-peak values. With the test protocol used in this study, the time to reach peak blood lactate concentration during recovery is similar for all runners, independently of track specialty. The results add to the knowledge pool to be taken into account when testing and interpreting abilities of runners of different running disciplines.