SPRINTERS’ STRENGTH TRAINING HAS TO BE MAXIMALLY EXPLOSIVE


The relationships between strength measures and various phases of sprinting performance were determined. Elite junior track and field athletes (M = 11; F = 9) performed maximum 50 m sprints being timed at 2.5, 5, 10, 20, 30, 40, and 50 m. Resultant applied forces were measured with two force platforms. Twenty-seven measures of strength and speed-strength were measured from height jumped and force-curve from take-off using pure concentric, stretch shortening cycle, and isometric muscular contractions.

The best predictor of starting performance (2.5-m time) was the peak force relative to body weight generated during a jump from a 120-degree knee angle (concentric contraction). The single best correlate of maximum sprinting speed was the force relative to body weight applied at 100 ms from the commencement of a loaded jumping action (concentric contraction).

Implications. The angle of the legs to generate the best start over 2.5 m should be in the vicinity of 120 degrees at the knees. Maximum running speed depends upon the ability of the runner to generate force quickly, that is, in about 100 ms, almost the length of time that the foot is in contact with the ground. The contact time for males averaged 101 ms and 108 ms for females. Thus, unless strength training trains the ability of the legs to generate forces in a very short time, that is, with maximum explosive force, slower training would not assist in the development of running speed. Strength training for sprinters should emphasize the most rapid development of leg forces.