

# AN ATHLETE'S PERFECT TWITCH

it down very quickly to create powerful forces during contractions, but they are very slow at rebuilding their ATP supplies once the ATP is used up. This is why they fatigue easily.

(7) When it comes to sprinting or running a marathon, many of the same muscles are used. The calf muscle, for instance, is important for both sports so the calf muscle has to have a mixture of both slow and fast twitch muscle fibers. What separates a world champion marathon runner from a world champion sprinter is the ratio of fast vs. slow twitch muscle fibers. The marathon runner will have a greater proportion of slow twitch muscle

fibers and the sprinter will have a larger proportion of fast twitch muscle fibers.

(8) We are all born with a specific proportion of slow and fast twitch muscle fibers and this can't be changed, however, what can be changed is how efficient these fibers are and how large the fibers become. With more endurance training, more slow twitch fibers will be recruited quickly when they are called to action. Not only that, but the fibers will hypertrophy, meaning they will grow larger. The same gains are seen with fast twitch fibers when training is focused on strength and power exercises.

## Article Questions

- 1) List the some of the factors that influence athletic performance.

Body morphology, endurance, strength, injury susceptibility and response to training. (2)

- 2) Fill out the chart below to summarize the differences between slow twitch and fast twitch B muscle fiber types. (4) – (6)

Fiber	Speed of Contractions	Fatigue and Endurance	Force Generated	ATP Synthesis	ATP Breakdown	Best for Which Sport
Slow Twitch	slow	takes long to fatigue so has high endurance	weaker forces	a lot is created and created quickly	slow break down of ATP	long endurance sports like marathons
Fast Twitch B	fast	fatigues quickly so has low endurance	stronger more explosive forces	less created and is created slowly	rapid break down of ATP	short power sports like sprinting

- 3) A doctor tells you that you were born with more slow twitch fibers than fast twitch fibers and that it would better if you joined the cross country running team instead of track and field for sprinting. You have always wanted to be a sprinter. What can you do to make up for your lower ratio of fast twitch to slow twitch muscle fibers? How will what you do increase your sprinting performance?

For sprinting you will need to train using a special program that focuses on strength and power exercises. This will help your sprinting because it will cause your fast twitch B muscle fibers to respond more quickly and cause them to hypertrophy (enlarge) with training. The fast twitch muscles will be the ones that will give you the explosive power needed for sprinting. (8)