



**AWARENESS & GUIDELINE S OF DIETARY PROTEIN AND MUSCLE RECONDITIONING
AMONG FEMALE LONG DISTANCE ATHLETE OF NORTH INDIA.**

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INTRODUCTION.

Nutrition plays an important role in the adaptive response of skeletal muscle to physical training or any exercise programme thereby modulating muscle reconditioning. Dietary protein as macro nutrients for athlete, in particular long distance runner, is generally not something of tremendous concern. Protein is mainly considered the domain of resistance trained athlete, long distance runner especially female athlete often escape the practice of consuming large amount of protein. The present study was conducted on female long distance runner , who were taking the training under renounced athletic Coach Dr. Ramesh Sindhu who has created /produced more than hundred athlete of different athletic discipline at national and international level. The information was collected through personal interviews of the female long distance runner who were taking the training at athletic centre of MDU Rohtak. A total number of 20 female athlete of long distance running were interviewed by the researcher at the centre. The main question now becomes: what role protein might play in the diet of long distance runner in term of assisting traing practices and particularly in giving the performance at different level of competition? None of the athlete not having the particular idea of role of protein in their performance . They all most all were having the idea of early recovery from the traing load if they are consuming the protein supplements, therefore they all were admitted that they have been taking the supplement without knowing that how much quantity protein is needed for a long distance runner? also they were not

aware about the quantity of protein in their health supplements which they were taking. It is already established that protein ingestion stimulates skeletal muscle protein synthesis, inhibits protein breakdown and as such stimulates muscle protein accretion following both resistance as well as endurance type of exercise. This will lead to a greater skeletal muscle adaptive response to each successive exercise session, resulting in more effective muscle reconditioning. Despite of limited evidence some basic guideline can be issued regarding the preferred amount, source and timing of dietary protein that should be ingested to allow proper post exercise muscle reconditioning.

Amount of Dietary Protein.

It has been well established that dietary protein ingestion effectively stimulates muscle protein synthesis rate both at rest and following the exercise, however there is no sufficient information on the amount of dietary protein that should be ingested to maximise post exercise muscle protein synthesis rate. None of the athletes have no idea about the amount of protein that should be ingested per day or after the training session. Moor et al reported that post exercise muscle protein synthesis rates increase with the ingestion of greater amount of protein, reaching maximal stimulation after ingesting 20g(egg) protein. The researcher speculated that athlete should ingest this amount of dietary protein 5-6 times daily to maximise skeletal muscle protein accretion.

Source of Dietary Protein.

Various studies have reported improvements in post exercise protein balance and/or greater muscle protein synthesis rates following the ingestion of whey protein, Casein protein, soy protein, egg protein and whole milk and/or fat free milk protein. Surprisingly athletes only know the whole milk and egg as source of protein. All the athletes were non-vegetarian and they prefer, cereal and milk as source of protein and of course the supplement which they were using during and after the training. 6 (Six) athletes have some fruits and dry fruits and sprouts which used in consuming after/ or during their training session. Milk protein and its constituents whey and casein, offer an anabolic advantage over soy protein. In this study all the athletes were more or less depend on the dietary protein which they received in their seasonal diet. It is also pertinent to mention here that all most all the

girls hostel living in their PG prepare their own meal. They were consuming very normal vegetarian diet by taking the raw vegetable and fruits from local vegetable mandi. They have the sense of saving in their diet being belonging to a average economic family background. For them the best source of protein is milk, cereals, rice and eggs (which they hardly take).

Carbohydrate co-ingestion:-

In the endurance trained athlete, rapid restoration of depleted muscle glycogen stores is generally a priority following completion of each training session due to which long distance athlete generally focus on carbohydrate ingestion to accelerate post exercise session recovery. Co ingestion of small amount of protein can accelerate muscle glycogene repletion when less than optimum amounts of carbohydrate(<1.0 gm/kg bodyweight/h) are ingested during the first few hours of post exercise session recovery()In gestion of carbohydrate during post exercise recovery inhibits the exercise induced increase in muscle protein break down. Therefore long distance runner often ingest a combination of protein plus carbohydrate during recovery from exercise session. all the athlete have admitted that they took substantial amount of rice with cereals and jaggery sugar (Shakar) after the training session. However co ingestion carbohydrate has no benefit on post exercise muscle protein synthesis rate. Though carbohydrate co-ingestion is not required to maximise post exercise muscle protein synthesis rate. It is likely that a little amount of carbohydrate will attenuate the post exercise rise in muscle protein breakdown rate, thereby improving protein balance.

Timing of Dietary Protein Ingestion.

Timing of the protein ingestion represents another important factor stimulating post exercise muscle protein anabolism. Immediate provision of dietary protein following cessation of exercise has been more beneficial in protein balance in the body when compared to protein provided several hour after exercise session. Further more recent studies suggest that carbohydrate and protein co ingestion prior to or during exercise may further augment post exercise muscle protein accretion. During the interview no athlete reveals that they have been taking any form of carbohydrate or protein prior or during the competition. Long distance female athlete of north India has no idea of taking the protein prior to exercise or

during exercise session, however they take the combination of carbohydrate and protein in lunch and dinner. Recent studies which have been conducted shows that the impact of exercise on stimulating post prandial muscle protein synthesis is maintained upto even 24 hours after the last exercise session. This seems to be in line with recent observations that protein ingestion prior to sleep stimulates muscle protein synthesis during overnight recovery allowing muscle reconditioning to occur during sleep.

Conclusion:- Long distance female athlete of north india had very little idea / knowledge of role of protein in their performance however they were occupied with the use of supplement which may have vitamins or protein. It is established that protein ingestion following endurance/ long distance exercise session facilitate the skeletal muscle adaptive response to each successive exercise session, thereby improving muscle tissue reconditioning, Athlete should use whey protein which is more effective than milk protein in stimulating post exercise muscle protein synthesis. Ingestion of 20-25 gm dietary protein during or immediately after an exercise session maximise post exercise muscle protein synthesis rate. co-ingestion of large amount of carbohydrate does not further augment post exercise muscle protein accretion. Athlete should go for protein ingestion prior to sleep allows muscle protein synthesis rates to increase during overnight recovery from exercise, which may further improve training efficiency. Having a glass of milk(Cow or bufflow) with jaggry before sleeping will accelerate overnight recovery.

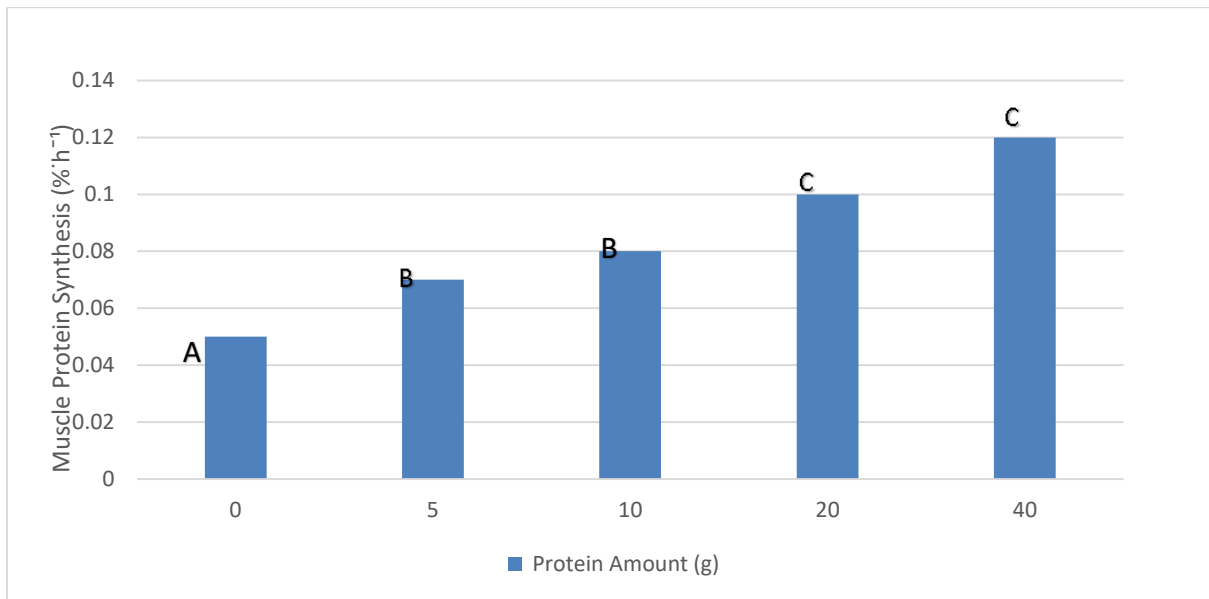


Figure 1 Dose response relationship between the amount of protein ingested and post exercise muscle protein synthesis rates. Values represent means±SEM. Means with different letters are significantly different from each other. Figure redrawn from Moore et al., Am J Clin Nutr 89: 161-168, 2009.

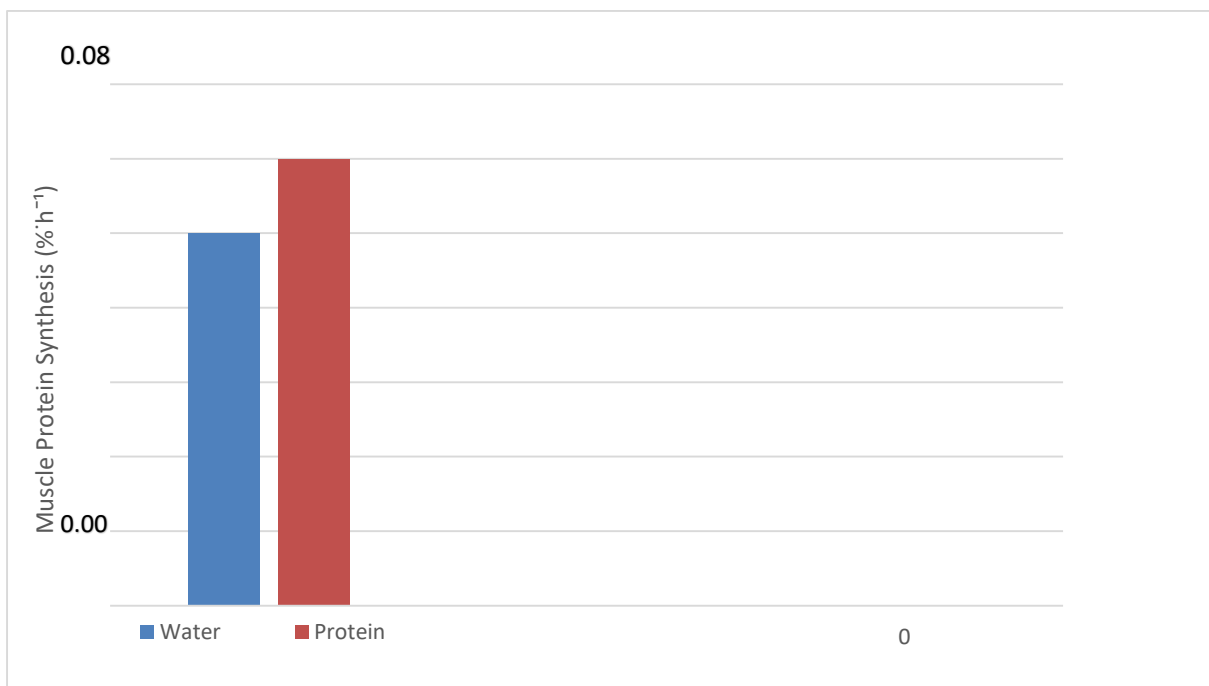


Figure 2. Dietary protein ingestion prior to sleep stimulated post exercise overnight recovery. Fractional synthesis rate (FSR) of mixed muscle protein during overnight recovery following ingestion of water or protein prior to sleep. Values represent means±SEM. *Significantly different from water (P=0.05). figure redrawn from Resat al., Med Sci Sports Exercise 44(8): 1560, 2012.

Nutritional Recommendations to support muscle reconditioning

- . Provide sufficient protein (20-25 g) with each main meal
- . Co-ingest some protein during prolonged exercise.
- . Ingest 20-25g protein immediately after exercise.
- . consume protein prior to sleep.

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