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Evening Whey Protein Intake, Rich in Tryptophan, and Sleep in Elite Male Australian Rules Football Players

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INTRODUCTION:

Fundamental to athlete recovery and performance is sleep (1). Protein intake has been shown as a potential strategy to influence sleep (2, 3), including in Australian Football League (AFL) players (4). An important factor in the protein-sleep relationship may be the type and timing of ingestion, with evidence indicating that protein high in the amino acid tryptophan consumed 2-4 hours before sleep may improve sleep outcomes (5, 6). However, it remains unclear whether these practices can improve sleep in athletic populations. The primary aim of this study was to investigate the effect of evening whey protein supplementation, rich in tryptophan on sleep in elite male AFL players.

METHODS:

A double-blinded, counterbalanced, randomised, cross-over study examined whether a whey protein supplement, rich in tryptophan, would improve sleep in 15 elite male AFL players on training and non-training days during pre-season. A 5-day pre-intervention period determined habitual dietary intake and baseline sleep measures, used to standardise dietary intake and timing of the supplement or placebo during the intervention. Dietary intake was assessed using a smartphone application (Easy Diet Diary). Sleep/wake behaviour was assessed using a wrist activity monitor (Actical) and sleep diary. Players were provided with either the whey protein supplement or placebo drink on each intervention day and instructed to consume the drink 3h prior to their habitual bedtime. The drinks were isocaloric and matched for taste and colour. All evening meals were provided in accordance with individual habitual intake and remained consistent between the interventions. Separate one-way repeated measures analysis of covariance for training and non-training days were used to analyse any differences between the whey protein supplement and placebo for sleep duration, sleep efficiency (SE), wake after sleep onset (WASO), sleep onset latency (SOL).

RESULTS:

The habitual sleep/wake behaviour during the 5-day pre-intervention period for bedtime, SOL, WASO, SE, wake up time and sleep duration on training days was 23:18 ± 1:12 (hh:mm), 18.8 ± 10.0min, 52.6 ± 31min, 90.0 ± 5.6%, 08:36 ± 01:18 (hh:mm), and 7.9 ± 1.1h, respectively and on non-training days was 22:54 ± 1:06 (hh:mm), 20.8 ± 13.1min, 49.5 ± 23.6min, 89.7 ± 4.3%, 07:18 ± 00:30 (hh:mm), and 7.1 ± 0.8h, respectively. No differences were observed for all sleep outcomes between consumption of the whey protein supplement and placebo on training and non-training days ($p > 0.05$).

CONCLUSION:

The consumption of a whey protein supplement, rich in tryptophan did not improve sleep outcomes in elite male AFL players. However, athletes may be able to ingest a high protein /energy intake close to bedtime without impairing sleep, an important finding for athlete recovery. It is unknown whether this intervention could be valuable for athletes with poor sleep, during periods of restricted sleep or for those athletes with a low habitual protein intake, requiring further investigation.

Topic: Nutrition

Presentation Oral

