

Intensive training affects the sleep, performance and mood of athletes – but more carbs may help

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Getting enough sleep is an essential part of any athlete's training programme, but a study in the Journal of Sports Sciences reveals intensive bouts of exercise can make it hard to get 40 winks. Suspecting that intense exercise can lead to sleep disturbance, scientists from Loughborough University studied the effects of two nine day periods of heavy training on 13 highly trained cyclists. The researchers monitored the athletes' moods, sleep patterns and performance before, during and after exercise. To determine whether diets could counter the effects of any sleep deprivation, the athletes were also given high or moderate amounts of carbohydrate throughout the study, though none of them knew which.

S.C. Killer and her colleagues discovered that even as little as nine days of intense training can cause 'significant and progressive decline in [sleep quality](#)'. They also noticed that the athletes' moods and capacity for exercise both worsened over the period of observation.

Interestingly, the data collected also indicated that the cyclists spent more time in bed during the intense training – suggesting that they were indeed tired out. But, the extra time under the covers didn't result in any more actual sleep. "Sleep efficiency was significantly reduced during the intensified training period," the researchers observed, with the number of times the athletes woke throughout the night significantly increased. In addition, the cyclists reported changes in their moods as the study

went on, including higher tension, anger, fatigue, confusion, depression and increased feelings and symptoms of stress.

As for the additional carbs, the team concluded that a high carbohydrate regime reduced some, but not all, of the effects of hard training. The moderate-carb athletes recorded more [sleep time](#), but this may demonstrate higher levels of fatigue and a greater need for recovery when following that diet.

This study is a key reminder of the importance of sleep to the recovery and performance for all athletes – as well as the effect that hard training can have on sleep.

As the authors note: "The cycle of successful training must involve overload to a state of acute fatigue, followed by a period of rest. The results of such training are positive adaptations and improvements in performance. However, if overloaded training is not followed by sufficient rest, overreaching may occur."

This study is also a reminder to all coaches of the need to build ample time for rest, including naps, into their [athletes' training](#) plans.

More information: S. C. Killer et al. Evidence of disturbed sleep and mood state in well-trained athletes during short-term intensified training with and without a high carbohydrate nutritional intervention, *Journal of Sports Sciences* (2015). [DOI: 10.1080/02640414.2015.1085589](https://doi.org/10.1080/02640414.2015.1085589)

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