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Research article

Does a Non-Circular Chainring Improve Performance in the Bicycle Motocross Cycling Start Sprint?

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ABSTRACT

Maximising power output during the initial acceleration phase of a bicycle motocross (BMX) race increases the chance to lead the group for the rest of the race. The purpose of this study was to investigate the effect of non-circular chainrings (Q-ring) on performance during the initial acceleration phase of a BMX race. Sixteen male cyclists (Spanish National BMX team) performed two counterbalanced and randomized initial sprints (3.95s), using Q- ring vs. circular chainring, on a BMX track. The sample was divided into two different groups according to their performance (Elite; n = 8 vs. Cadet; n = 8). Elite group covered a greater distance using Q-ring (+0.26 m, p = 0.02; D = 0.23), whilst the improvement for the Cadet (+0.04 m) was not significant (p = 0.87; D = -0.02). Also, there was no significant difference in power output for the Elite group, while the Cadet group revealed larger peak power with the circular chainring. Neither lactate level, nor heart rate showed significant differences due to the different chainring used. The non-circular chainring improved the initial acceleration capacity only in the Elite riders.

Key words: Power, efficiency, pedalling, biomechanics, lactate

Key Points

- This work provides novel results demonstrating very significant improvements in the sprint performance of BMX cycling discipline using a non-circular chainring system.
- This study seeks a practical application from scientific analysis
- All data are obtained in a real context of high competition using a sample comprised by the National Spanish Team.
- Some variables influencing performance as subjects' physical fitness are discussed.
- Technical equipment approved by International Cycling Union is studied to check its potentially beneficial influence on performance.

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