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# EFFECTS OF CAFFEINE ON HIGH-INTENSITY FUNCTIONAL TRAINING PERFORMANCE

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## ABSTRACT

Caffeine demonstrates an ergogenic effect on endurance exercise performance, however, limited information exists establishing its efficacy during high-intensity functional training (HIFT). HIFT is an exercise program that incorporates a variety of multi-joint movements performed at a relatively high-intensity and designed to improve parameters of general physical fitness and performance. PURPOSE: Our study aimed to determine the effects of caffeine on HIFT performance. METHODS: 13 HIFT-trained men (age = 28.5 ± 6.6 years, HIFT experience = 4.1 ± 3.0 years, body weight= 84.3 ± 9.9 kg) were randomized in a double-blind, crossover design. After consent, participants completed two HIFT sessions separated by a 7-day washout period, 60-minutes after consuming 5mg/kg of caffeine or a placebo. During HIFT sessions, participants completed as-many-rounds-as-possible in 20 minutes of 5 pull-ups, 10 push-ups, and 15 air squats, with performance measured as the number of rounds completed (30 repetitions = 1 round). Paired-samples t-tests were used to compare HIFT performance between the caffeine and placebo conditions and to test for a potential learning effect between the first and second sessions. RESULTS: Participants significantly improved HIFT performance during the caffeine trial (15.3 ± 3.6 rounds) as compared to placebo (14.3 ± 3.0 rounds), t(12) = -2.783, p < 0.05. The eta squared statistic (0.39) indicated a large effect size. Moreover, no significant learning effect was identified between the first and second sessions (14.9 ± 3.2 vs. 14.7 ± 3.5 rounds, p = 0.73). CONCLUSION: Caffeine elicited an ergogenic response during HIFT in HIFT-trained men, with no identifiable learning effect, which is useful for competitive HIFT athletes aiming to optimize performance. However, future investigations should establish the efficacy of caffeine during varying-duration HIFT sessions and among female HIFT athletes.

## INTRODUCTION

- Caffeine may improve athletic performance through ergogenic effects.
- Caffeine has been documented to improve endurance time trial performance.<sup>1</sup>
- Evidence is lacking for the effects of caffeine on a combined aerobic and resistance workout performance.<sup>2</sup>
- Recently, high-intensity functional training (HIFT) which includes endurance, weightlifting, and gymnastics activities performed at a relatively high-intensity, has gained attention among the scientific community.
- However, due to HIFT’s novelty, limited information exists regarding effects of caffeine.

## PURPOSE

*Our study aimed to determine the effects of caffeine on HIFT performance. We hypothesized that caffeine supplementation would improve HIFT performance.*

## METHODS

### Design

- Double-blind cross-over study

Table 1: Participant Characteristics (N=13)

Variable	Mean ± SD or %
Age	28.5 ± 6.6 years
Height	178.9 ± 5.1 cm
Weight	84.3 ± 9.9 kg
Body Fat %	20.1 ± 2.9 %
HIFT experience	4.1 ± 3.0 years



### Procedure

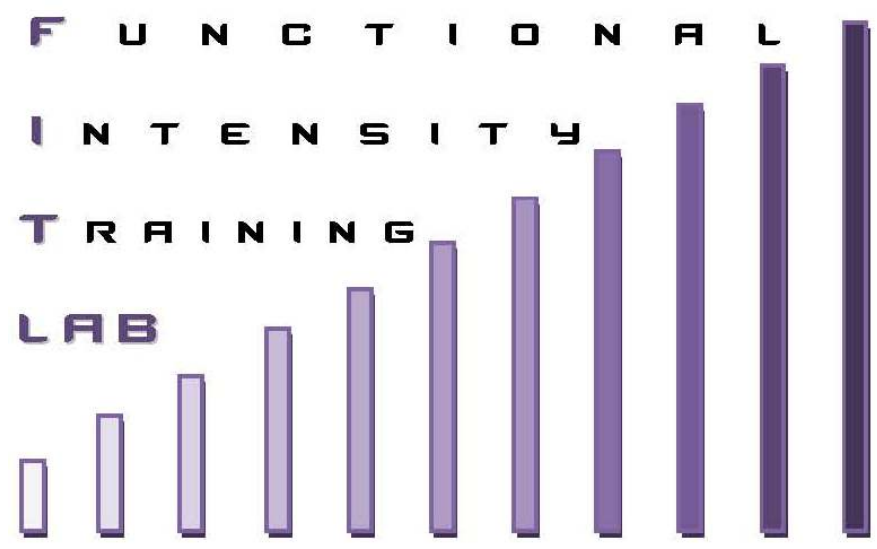
- Participants attended two laboratory sessions with a 7 day wash out period between.
- Participants consumed 5 mg/kg of body weight of 200mg caffeine pill(s) or a biotin placebo 60 minutes prior to the HIFT session.
- Performance was measured by the total number of rounds completed in 20 minutes (1 round = 30 reps).

### Analysis

- Paired-samples t-tests were used to compare HIFT performance between the caffeine and placebo conditions and to test for a potential learning effect between the first and second sessions.



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## RESULTS

Table 2: HIFT Performance (Total rounds completed).

Condition/Session	Rounds (Mean ± SD )
Placebo	14.3 ± 3.0
Caffeine	15.3 ± 3.6*
Session 1	14.9 ± 3.2
Session 2	14.7 ± 3.5

Table 2: HIFT performance (total rounds completed) was significantly higher during the caffeine condition compared to the placebo (p < 0.05). No significant difference was found in HIFT performance between the first and second session ( p = 0.073).

\* Significantly different from placebo at p <0.05

## CONCLUSIONS

Overall, caffeine elicited an ergogenic response in HIFT performance among HIFT-trained men with no identifiable learning effect, which is useful for competitive HIFT athletes aiming to optimize performance. However, future investigations should establish the efficacy of caffeine during varying-duration HIFT sessions and among female HIFT athletes.

## ACKNOWLEDEMENTS

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