



# The Effects of a Caffeine Pill on Time Performance Between Male and Female Division 1 Collegiate Swimmers

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## Abstract

- ❖ 14 collegiate swimmers from a Division 1 University in North Carolina took part in this study
- ❖ Testing group consumed a caffeine pill equal to 3 mg/kg of body weight on hour before testing. Control group received a placebo in place of the caffeine pill.
- ❖ Base line times for a 50-yard freestyle was recorded through their conference championship as well as a 50-yard freestyle performed in the offseason.
- ❖ Both groups were tested on two 50-yard freestyles performed at Bost Pool.
- ❖ After the both swims were concluded, the resulting data from the two groups were compared.

## Introduction & Review of Literature

- ❖ The National Collegiate Athlete Association has deemed the overuse of caffeine as a ban from sports performance. It was found that the use of 500 mg of caffeine found in urine will be seen as illegal and disqualify the athlete (International Olympic Committee, 2018).
- ❖ Caffeine was shown to provide athletes with ergogenic effects through consumption before athletic performances (Pickering & Grgic, 2019; Lara et al., 2015; Mielgo-Ayuso et al., 2019).
- ❖ Caffeine can be consumed in several methods such as, a capsule, pill, or energy drink supplement.
- ❖ Several factors affect the benefits of caffeine, these include time of ingestion, amount of caffeine in each supplement, time of day when exercise is performed, and type of supplement consumed (Pickering & Grgic, 2019, Trexler et al., 2015, Graham, 2002)

## Purpose

- ❖ The purpose of this study was to assess if the usage of a caffeine pill dosage of 3 milligrams of caffeine per kilogram had any effect on time improvement in a 50-yard freestyle among male and female collegiate swimmers.
- ❖ It was hypothesized that the addition of caffeine will improve the time standards of these athletes.

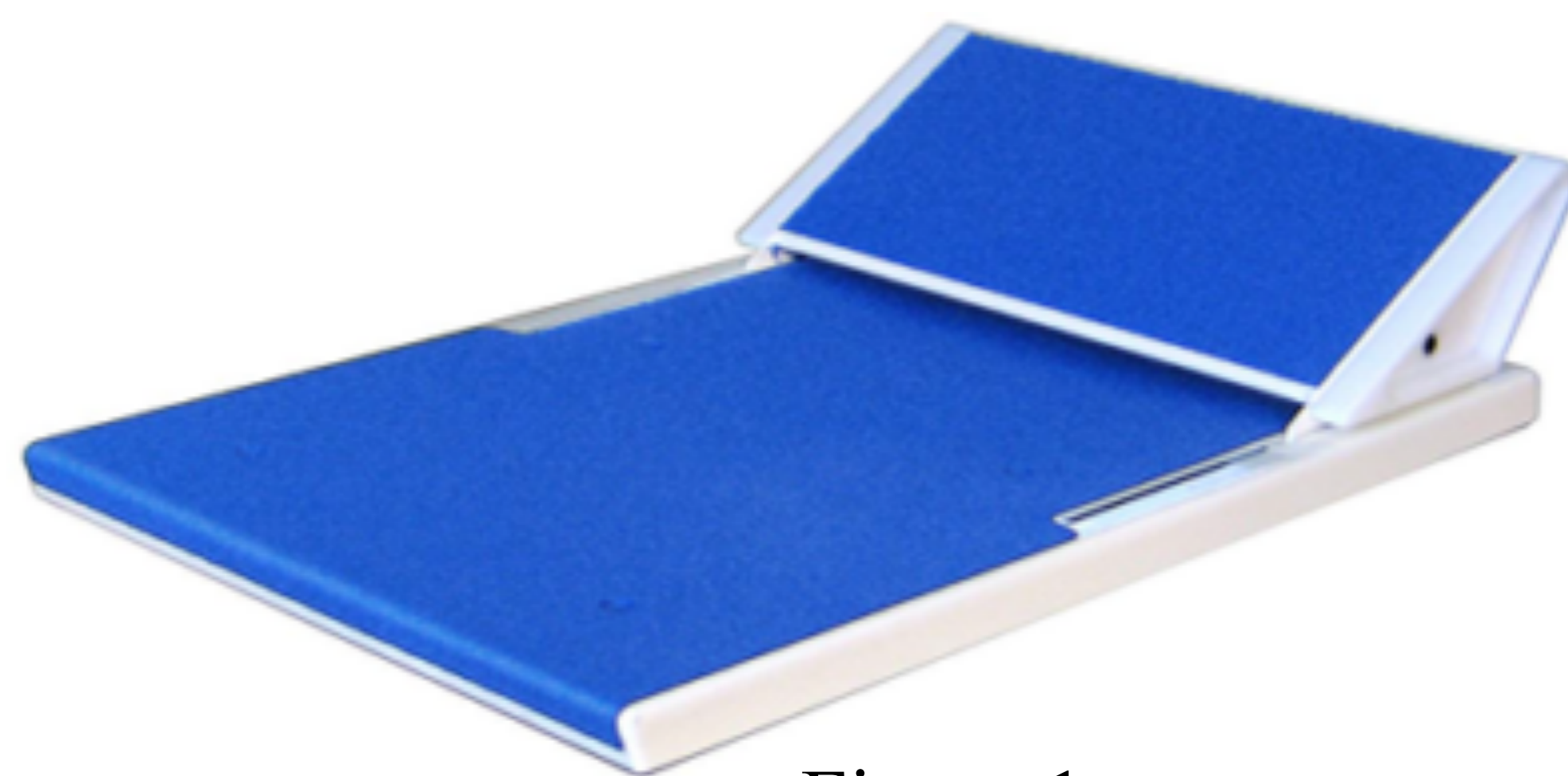
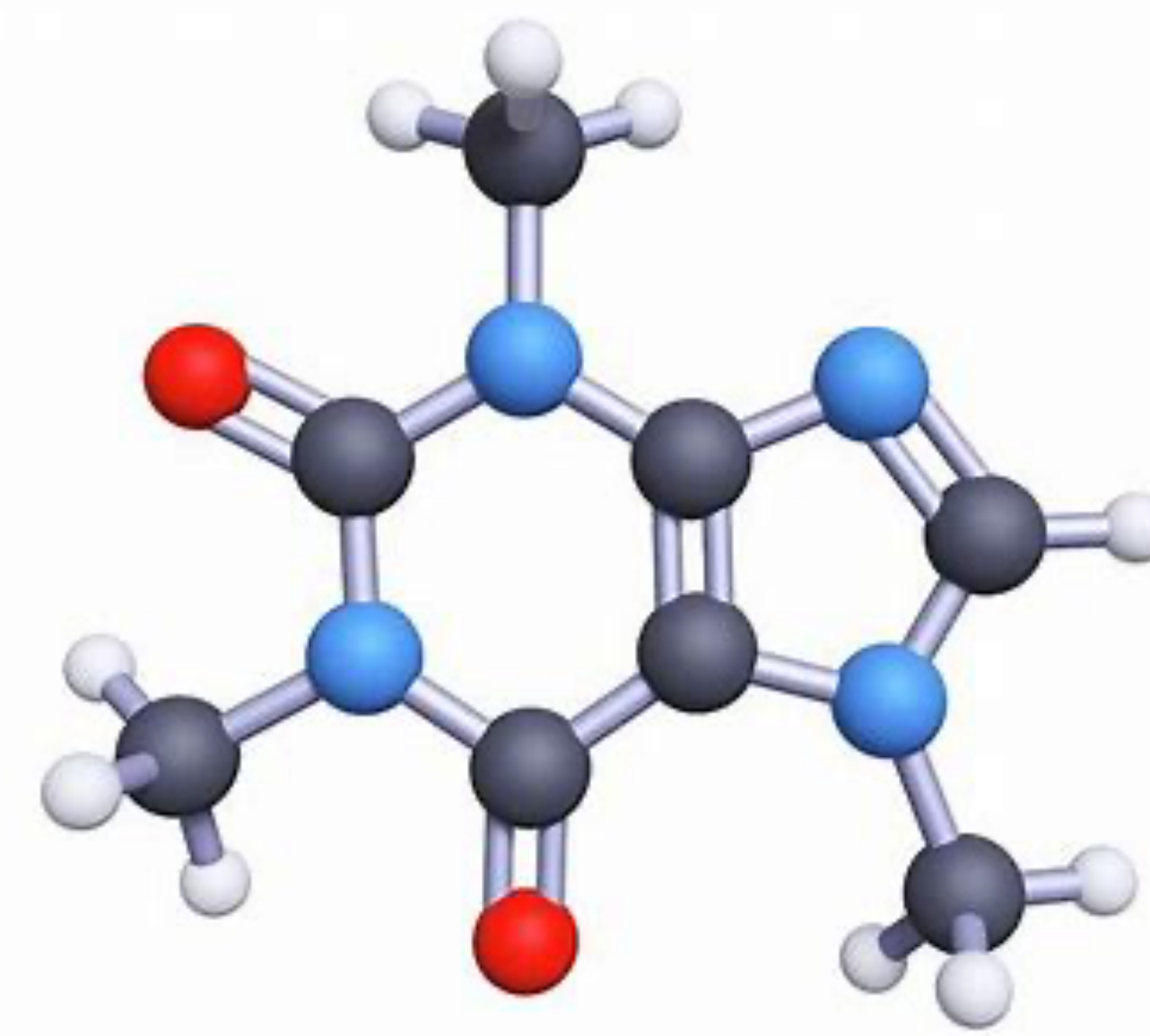


Figure 1

<https://unitedsportsservices.com/product/omega-osb12-swimming-starting-platform/>



Caffeine  
 $C_8H_{10}N_4O_2$   
<https://fineartamerica.com/featured/caffeine-molecule-greg-williamsscience-photo-library.html>



<https://www.blufftonsun.com/swimming-efficiently-by-reducing-resistance/>

## Methods

### Participants

- Informed consent was gathered from all participants
- Both a testing and a control group were used (N = 14)
- Ethics consent was granted through each of the Universities ethics committees

### Intervention

- Testing group implemented a caffeine supplement in addition to their swim performance
- Control group consumed a placebo before testing.
- Pre- and Post caffeine consumption data was collected and compared

### Instruments

- An EXTECH stopwatch was used to record time for swim performance, testers used index fingers to start and stop the watch.
- All swim performances were done at Bost Pool at Gardner-Webb University
- All aquatic testing used the Omega OSB-12 starting block (Figure 1)

### Data Analysis

- Independent sample t-tests were used
- Pre and post program assessment data was compared
- Significant differences between groups aid in the identification of benefits

## Operational Definitions

- ❖ **Caffeine:** common stimulant that is found in coffee and tea which enhances physical and cognitive awareness and activation potential
- ❖ **Ergogenic:** intended to enhance performance, stamina, and recovery
- ❖ **Rate of Perceived Exertion (RPE):** A form of measurement on how subject's feel after completing an exercise. How hard one feels the body is working.
- ❖ **Time Improvement:** Any reduction to time it takes to swim a 50-meter freestyle. In swimming a .10 (one-tenth) of a second is deemed as a sufficient time drop.

## Conclusion

- ❖ Limitations include the size of the sample is not enough to determine caffeine's effect on the whole swimming community.
- ❖ The skill and experience of performing a 50-yard freestyle is different with each subject.
- ❖ The previous consumption of caffeine among participants could vary the effects of caffeine on time performance in this study.

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## References

- Graham, T. E. (2002). Caffeine and exercise. *Sports Medicine*, 31(11), 785–807. doi:10.2165/00007256-200131110-00002
- International Olympic Committee. (2018, December 17). *The history of Olympic swimming*. Olympics.com. Retrieved February 14, 2022, from <https://olympics.com/en/news/the-history-of-olympic-swimming>
- Lara, B., Ruiz-Vicente, D., Areces, F., Abián-Vicén, J., Salinero, J., Gonzalez-Millán, C., Gallo-Salazar, C., & Del Coso, J. (2015). Acute consumption of a caffeinated energy drink enhances aspects of performance in sprint swimmers. *British Journal of Nutrition*, 114(6), 908–914. doi:10.1017/s0007114515002573
- Mielgo-Ayuso, J., Calleja-Gonzalez, J., Del Coso, J., Urdampilleta, A., León-Guereño, P., & Fernández-Lázaro, D. (2019). Caffeine supplementation and physical performance, muscle damage and perception of fatigue in soccer players: A systematic review. *Nutrients*, 11(2), 440. doi:10.3390/nu11020440
- Pickering, C., & Grgic, J. (2019). Caffeine and exercise: What next? *Sports Medicine*, 49(7), 1007–1030. doi:10.1007/s40279-019-01101-0
- Trexler, T., Roelofs, J., Hirsch, R., Mock, G., & Smith-Ryan, E. (2015). Effects of coffee and caffeine anhydrous on strength and sprint performance. *Journal of the International Society of Sports Nutrition*, 12(S1), 1224–1233. doi:10.1186/1550-2783-12-s1-p57