

TOPICAL EDGE LOTION UNLOCKS PROVEN BICARBONATE SCIENCE

Study Conducted by Dr. Mark Kern, PhD, RD of San Diego State University's Exercise & Nutritional Sciences Department

THE SCIENCE OF BICARBONATE

Muscles generate acid under exertion, commonly referred to as lactic acid. This decrease in muscle pH negatively affects several steps involved in the excitation and contraction of muscle cells. **Sodium bicarbonate supplementation works by alkalizing the blood**, reducing the acidification of muscle and improving athletic performance.

The side effects of oral ingestion have always limited athletes' real-world ability to take an effective dose. **Current forms of oral bicarbonate intake often lead to side effects** like indigestion, bloating, gas, vomiting, and diarrhea. Still, over 30 studies in scientific literature support the use of sodium bicarbonate supplementation as an athletic aid and its benefits are well understood.

A NEW PATH

Topical Edge Sports Lotion is a topical analgesic that combines menthol, sodium bicarbonate (baking soda), and a **ground-breaking drug delivery technology developed in medicine**, shown to deliver molecules through the skin. Topical Edge uses this technology to deliver sodium bicarbonate where it is needed most while bypassing the stomach. Topical Edge provides athletes with the **first and only consumer product proven to effectively supplement sodium bicarbonate in the muscle and blood**. It is **certified free of banned substances** and is as easy as applying a lotion.

SUMMARY RESULTS WITH TOPICAL EDGE

- **Reduced muscle soreness** following intense exercise
- **Lower heart rate and rate of perceived exertion** under the same training loads
- **Higher lactate levels** to fuel the muscle

RIGOROUS STUDY DESIGN

Dr. Mark Kern, PhD, RD of San Diego State University's Exercise & Nutritional Sciences Department was sponsored to conduct a **rigorous institutional review board (IRB) approved, double-blind, randomized, placebo controlled, cross-over study of Topical Edge in elite professional and semi-professional cyclists** (N=20). Study participation was limited to 18-50 year-old highly trained athletes with category 1-3 professional cycling licenses, training for their racing season.

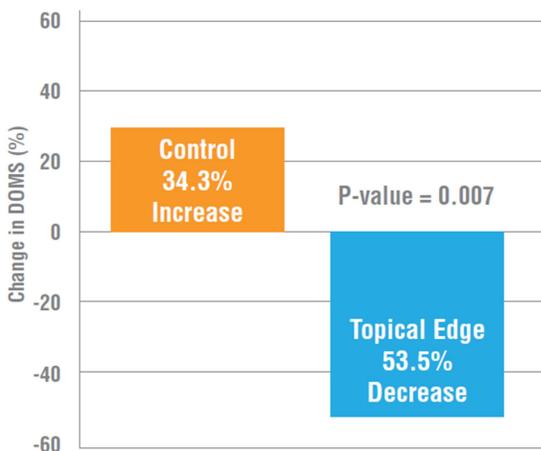
Visits 1 and 2 – Short Intensity	Visits 3 and 4 – Long Intensity
<ul style="list-style-type: none">• Ramp test with workload increased by 20 watts every 3 minutes until perceived exertion reached 17+ of 20• 30 second sprint at maximum effort• 5 minute time trial of maximum work over duration• 5 minute recovery between each stage	<ul style="list-style-type: none">• 1 hour time trial of maximum work over duration

STUDY RESULTS

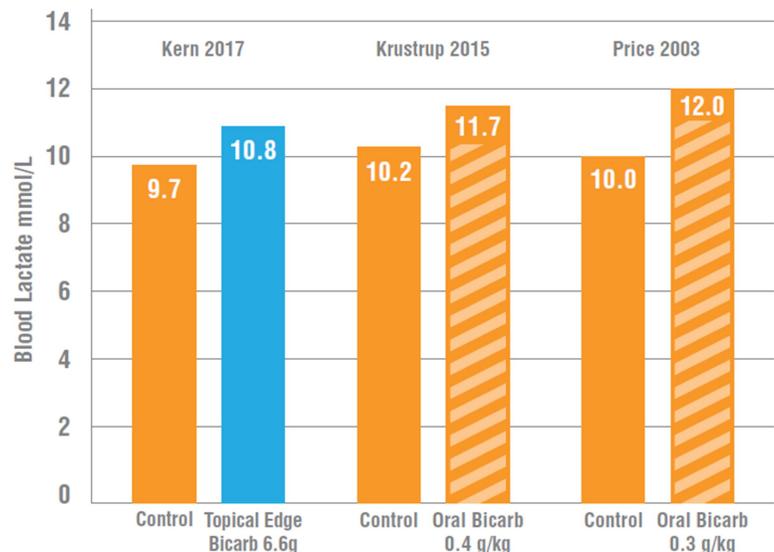
The results showed statistically significant improvement across delayed onset muscle soreness (DOMS), heart rate, perceived exertion, and blood lactate in a well-designed study of elite cyclists.

- **Faster recovery.** From the first day to the second day following a series of short, intense efforts, **subjects using Topical Edge experienced a 53.5% reduction in DOMS** versus a rise of 34.3% with control ($p=0.007$). By reducing muscle soreness, an athlete is able to perform at a high level more consistently or simply feel better in the days following soreness inducing sports.
- **Less taxing effort.** Heart rate was 1.6% lower versus control immediately after a 5 minute time trial of short, intense effort ($p=0.031$). **Heart rate was 3.1% lower and rate of perceived exertion was 2.6% lower** measured 15 minutes into a 1 hour time trial ($p=0.004$, $p=0.054$). A lower heart rate after intense exercise means the body is less taxed and is able to recover for the next bout quicker. Lactate threshold and peak power in the 30 second sprint, and average watts and total work done in the 1 hour time trial all directionally favored Topical Edge over control, warranting further study.
- **Robust buffering.** **Blood lactate was 11% higher** for subjects using Topical Edge when compared to control by the end of the series of high intensity tests. The magnitude of this finding is similar to results seen with oral intake in published scientific literature, suggesting that **Topical Edge unlocks the power of bicarbonate** through a new delivery route. Increased lactate may benefit performance by providing fuel for muscles when working anaerobically.

Topical Edge Reduces DOMS From 24 to 28 Hours Post-Exercise



Topical Edge Shows Similar Buffering to Oral Sodium Bicarbonate Use



CONCLUSION

Topical Edge has been shown to provide statistically significant changes in athletes' physiology. By changing the delivery route, Topical Edge supplements bicarbonate in a new way, helping athletes train harder and recover faster. The results of this study will be submitted for publication and additional studies are currently underway.