



PERFORMANCE. ENDURANCE. STRENGTH.  
POWERED BY OUTLAST®

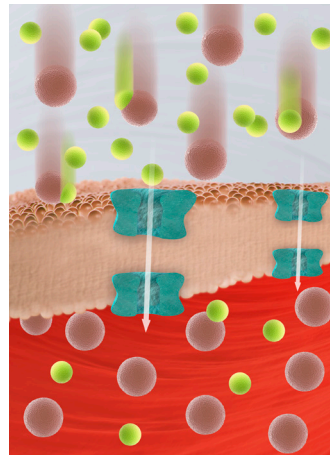
### Boost Creatine Absorption up to 50 Percent

Creatine is one of the most researched supplements on the market. This natural substance made of amino acids is in high demand by athletes and professionals alike because of its known efficacy and safety. Increased creatine levels yield boosted exercise capacity in order to train harder and gain quicker results. Outlast takes it to the next level. Improve performance, endurance and strength with greater creatine absorption powered by Outlast.

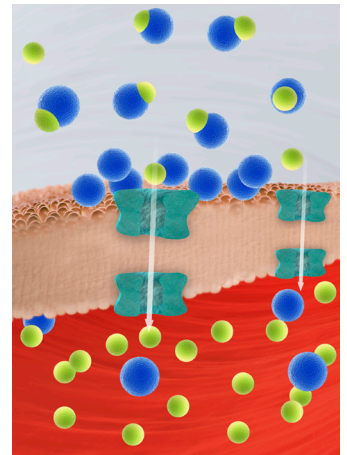
**What is Outlast?** Exclusively available through HORN, Outlast is a proprietary and patented creatine-Palatinose™ blend clinically proven to improve the bioavailability of creatine in the blood up to 50 percent compared to using dextrose as a carbohydrate transport mechanism.<sup>1</sup>

Palatinose is a naturally-sourced functional carbohydrate with a slow digestion process reflected in its modulated blood glucose response. Since the blood glucose peak of Palatinose is lower, the presence of Palatinose is sustained in the body for a longer time period. When combined with creatine as a transport system, Palatinose's slow glucose release significantly increases the amount and efficiency of creatine absorbed in the body. This innovative delivery of creatine is called Outlast.

### Creatine Transport: Dextrose vs. Outlast



Rapid delivery of creatine in the blood with dextrose.



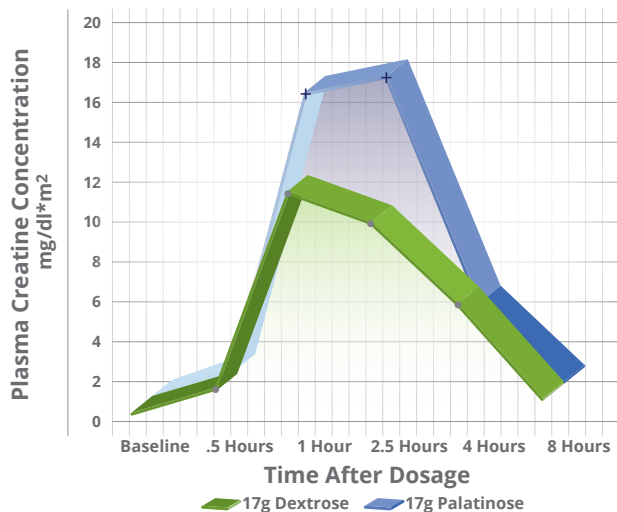
Sustained delivery of creatine in the blood with Outlast.

While dextrose is commonly used as a transport for creatine today, this simple sugar is quickly absorbed in the body, leaving less available to usher creatine across the gut and into blood via the transport protein. The significantly altered pharmacokinetic profile of taking Outlast to optimize creatine uptake therefore provides a breakthrough supplement proven safe and effective to help athletes, gym regulars or anyone seeking to boost their energy, work capacity, strength and power.

# OUTLAST | CLINICALLY PROVEN CREATINE TRANSPORT.

## The Outlast® Advantage

- Maximum creatine absorption with Outlast (3g creatine monohydrate, 17g Palatinose) was 50 percent higher than dextrose.<sup>1</sup>
- Outlast's proprietary blend features Palatinose, which is proven to also provide a steadier and longer carbohydrate energy supply.
- Both creatine and Palatinose are already highly regarded and are safe and effective.



## Clinical Study

### Design

- Randomized double-blind clinical trial with N=30 males
- Randomized to 3g of creatine monohydrate in combination with Palatinose or dextrose in the following doses: 5g, 17g or 50g.
- Rate of absorption ( $T_{Max}$ ), total absorption ( $AUC_{0-8h}$  and  $C_{Max}$ ) determined from blood.

### Results

- $C_{Max}$  was ~50.8 percent higher for the Palatinose treatment with the 17g dose ( $p < 0.001$ ) vs. dextrose; AUC was ~35.4 percent greater with Palatinose vs. dextrose at 50g dose ( $p = 0.046$ ).
- For all three doses (cumulatively)  $C_{Max}$  and AUC were significantly greater for Palatinose vs. dextrose by 32 percent and 30.9 percent, respectively ( $p = 0.005$  and  $0.027$ ).

## Recommended Outlast Dosage

- 3:17 (3g creatine monohydrate, 17g Palatinose) for the strongest scientific substantiation.

## Potential Applications

- Pre- and intra-workout products
- Meal replacement powders for quality, lean muscle mass
- Endurance performance products
- Strength, power and endurance performance products
- Products for cognitive performance under duress



## Potential Claims with Outlast

- ✓ Improves systemic amino acid/creatine bioavailability\*
- ✓ Facilitates delivery and uptake of creatine\*
- ✓ Provides greater peak and sustained concentrations of creatine in blood\*
- ✓ Extends energy supply\*
- ✓ Increases work capacity\*
- ✓ Boosts single and repetitive sprint performance\*
- ✓ Increases muscle mass and strength adaptations during training\*
- ✓ Enhances glycogen synthesis\*
- ✓ Increases anaerobic threshold\*
- ✓ Enhances aerobic capacity\*
- ✓ Improves recovery\*
- ✓ Boosts training tolerance\*

Outlast is a proprietary and patented blend exclusively available through HORN Human Nutrition, the industry source for science-based innovations and best-in-class ingredients.™

Learn more by visiting [ethorn.com/outlast](http://ethorn.com/outlast) or email [nutra@ethorn.com](mailto:nutra@ethorn.com) to request a sample.

<sup>1</sup>Kalman et al. *Journal of the International Society of Sports Nutrition* 2012, 9 (Suppl 1): P14. <http://www.jissn.com/content/9/S1P14>

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\*These statements have not been evaluated by Food and Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease.