Beta-alanine

An amino acid sold as powder, capsules or sustained-release tablets, often found in pre-workout blends.

Key compounds: Beta-alanine, which combines with histidine in muscle to make carnosine, a buffer against acid build-up during hard effort.

Research summary: *Moderate evidence* for supporting performance in high-intensity efforts lasting roughly 1 to 4 minutes (such as intervals, rowing and sprint finishes), with benefits building over several weeks. Little benefit for very short or very long efforts (Saunders et al., 2017; Trexler et al., 2015).

How well supported are the key benefits?

Benefit	Evidence	What the research shows
High-intensity exercise lasting 1 to 4 minutes	Moderate	Small average improvements in reviews, building over weeks (Saunders et al., 2017)
Muscular endurance (higher-rep sets)	Emerging	Results mixed
Maximal strength	Limited	No clear effect; more research needed (Trexler et al., 2015)
Long steady endurance	Limited	Little to no effect; more research needed beyond 25 minutes (Trexler et al., 2015)

Who it matters most for:

1. Athletes in repeated hard efforts of 1 to 4 minutes, such as rowing, middle-distance running, interval training and combat sports (Trexler et al., 2015)
2. Vegetarians and vegans, who tend to have lower muscle carnosine (Everaert et al., 2011)
3. Older adults: muscle carnosine falls with age (Everaert et al., 2011), and the ISSN position stand notes beta-alanine may reduce neuromuscular fatigue in older people (Trexler et al., 2015), but the evidence is limited
4. Not useful for very short sprints, long steady endurance or strength work with long rests

Typical amounts:

1. 3.2 to 6.4 g per day in divided doses of no more than 1.6 g each, for at least 4 weeks (Trexler et al., 2015, recommend 4–6 g per day)
2. Daily consistency matters more than timing

Cautions: Harmless tingling (paresthesia) in the face and hands is common, especially with large single doses. Splitting doses or using sustained-release forms reduces it (Trexler et al., 2015). Not enough safety data for pregnancy or breastfeeding, so those customers should avoid it. Check with a clinician if on regular medication.

References

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2. Trexler, E. T., Smith-Ryan, A. E., Stout, J. R., Hoffman, J. R., Wilborn, C. D., Sale, C., Kreider, R. B., Jäger, R., Earnest, C. P., Bannock, L., Campbell, B., Kalman, D., Ziegenfuss, T. N., & Antonio, J. (2015). International Society of Sports Nutrition position stand: Beta-alanine. *Journal of the International Society of Sports Nutrition*, 12, 30. https://doi.org/10.1186/s12970-015-0090-y
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