



@physicaltherapyresearch

RAPID RESEARCH

April 2023

Inside This Week: Supplements & Sports/Exercise Performance

- ✓ Does Protein Supplementation Improve Strength & Muscle Mass Gains?
- ✓ Does HMB Supplementation Improve Strength or Body Composition?
- ✓ Does Coenzyme Q10 Improve Exercise or Sports Performance?



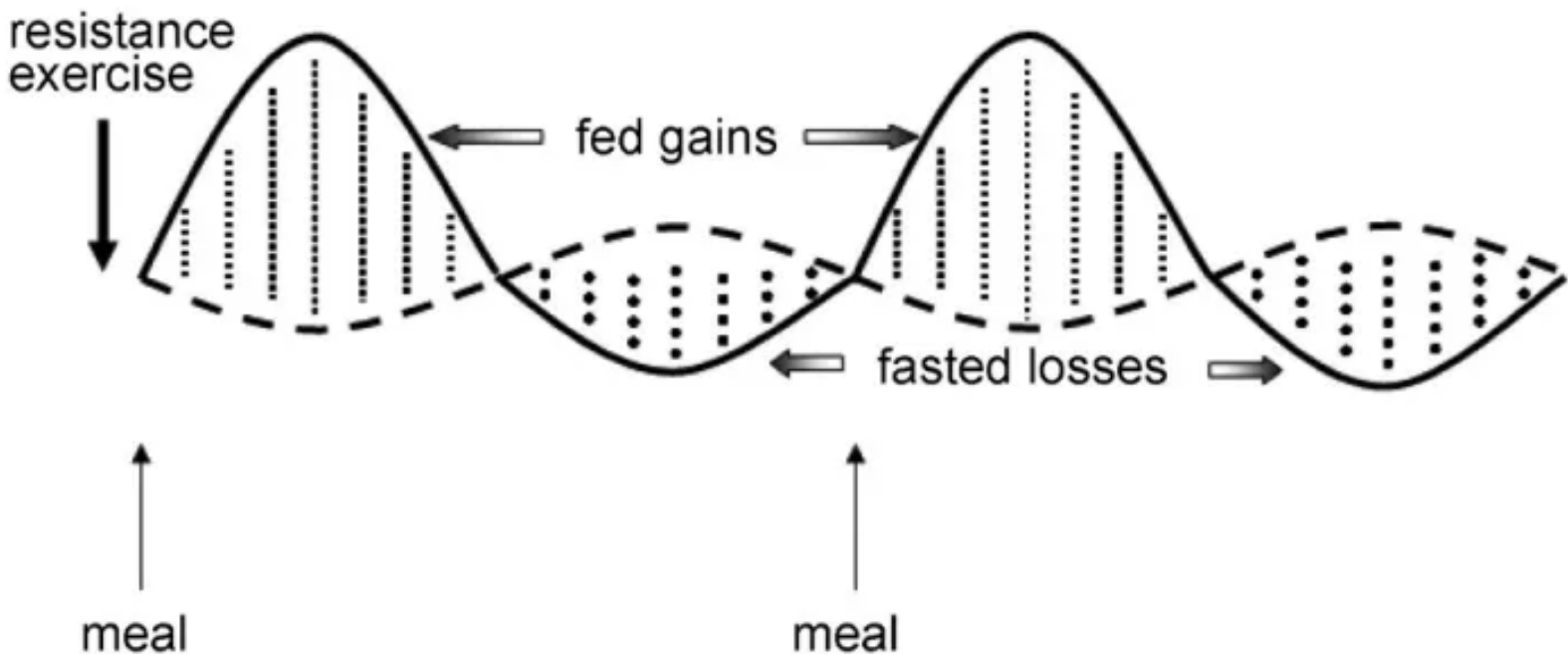
[Click for Full Text](#)
(Morton et al. 2017)

DOES PROTEIN SUPPLEMENTATION IMPROVE STRENGTH & MUSCLE MASS GAINS?

JBI 11/11 [100%]



This systematic review and meta-analysis determined if dietary protein supplementation augments resistance exercise training (RET)-induced gains in muscle mass and strength.



KEY FINDINGS

49 studies included; 1863 participants

Dietary protein supplementation significantly increased changes in:

Strength [1-rep max; 2.49 kg]

Fat Free Mass (FFM) [0.30 kg]

Muscle size [Cross-sectional Area]

**From 6 to 52 weeks of RET*

Gains in FFM were reduced with increasing age [-0.01 kg]

Supplementation was more effective in resistance-trained individuals [0.75 kg]

Protein supplementation beyond total protein intakes of **1.62 g/kg/day** resulted in no further RET-induced gains in FFM.

MAIN TAKEAWAYS

Dietary protein supplementation augments changes in muscle mass and strength during prolonged RET.

Protein supplementation is more effective at improving FFM in young or resistance-trained individuals than in older or untrained individuals.

Protein supplementation is sufficient at ~1.6g/kg/day in healthy adults during RET.

This analysis shows that dietary protein supplementation can be, if protein intake is less than 1.6 g protein/kg/day, both sufficient and necessary to optimize RET-induced changes in FFM and 1RM strength.

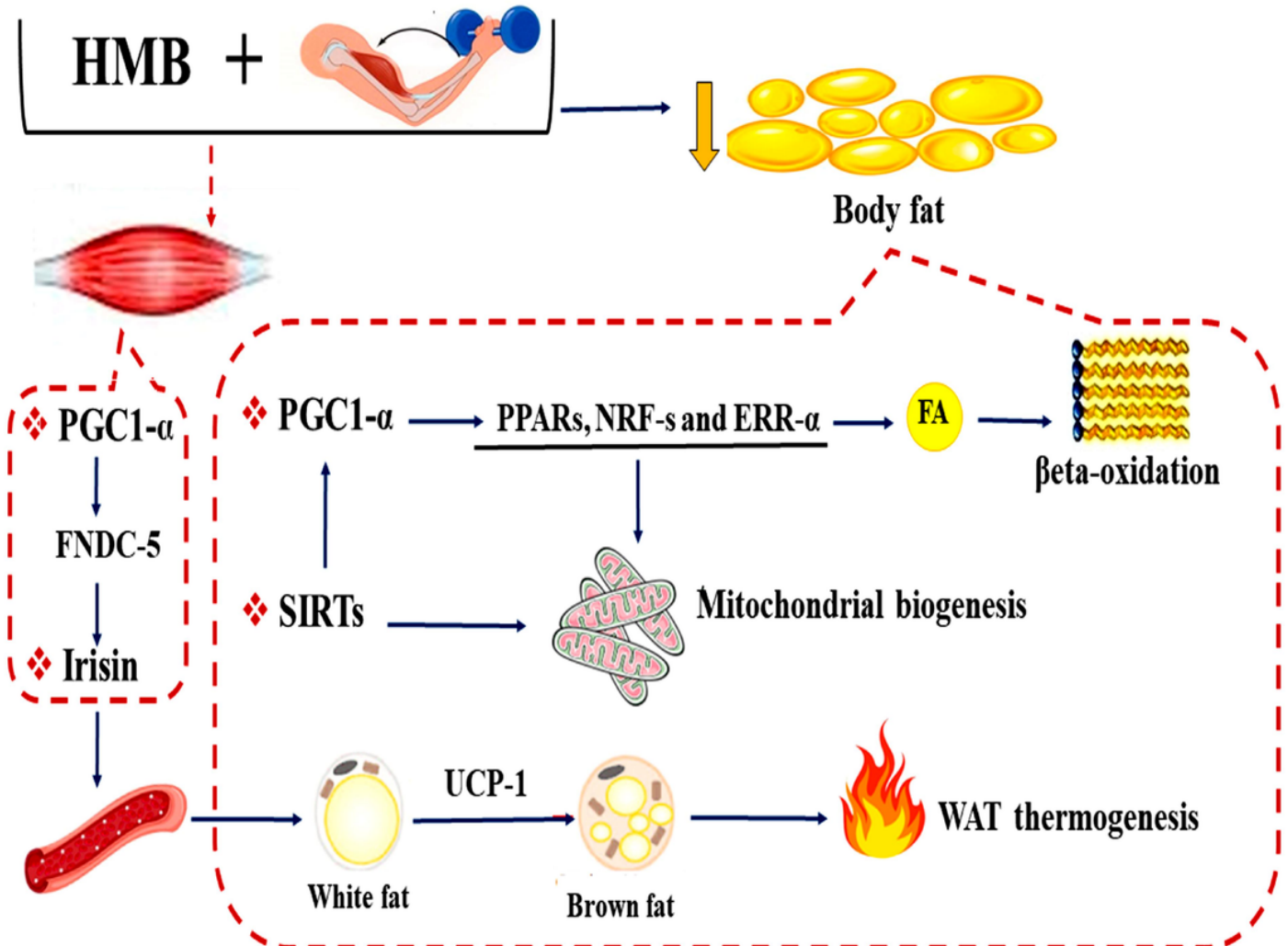
[Click for Full Text \(Jabukowski et al. 2020\)](#)

DOES HMB SUPPLEMENTATION IMPROVE STRENGTH OR BODY COMPOSITION?

JB1 11/11 [100%]



This systematic review analyzed whether or not HMB supplementation augments resistance exercise-induced gains in fat-free (i.e., lean) mass, reductions in body fat mass (FM), and increases in strength.



**11 studies were included,
302 participants for body mass analysis, 248 for strength analysis.**

Total Body Mass HMB vs Control:

Avg gain [1.12 kg vs 0.78 kg]

Lean body mass difference [0.29 kg]

Fat Free Mass HMB vs Control:

Fat Free Mass Gain [1.57 kg vs 1.17 kg]

Avg Fat Loss [0.73 kg vs 0.47]

1-Rep Maximum Strength HMB vs Control:

Total 1RM [32.0 vs 30.6 kg]

Bench Press 1RM [9.6 vs 9.5 kg]

Lower Body 1RM [Avg difference 2.82 kg]

MAIN TAKEAWAYS

HMB supplementation during RET may result in a small increase in Total Body Mass but does not result in a significant enhancement of gains in Fat Free Mass or losses of Fat Mass.

HMB supplementation isn't likely to improve body composition caused by RET in young subjects.

Effects on strength were also not significant.

Some studies reporting significant HMB effects to optimize RET adaptations are not commonly reproducible or have a considerable risk of bias.

[Click for Full Text \(Drobnic et al. 2022\)](#)

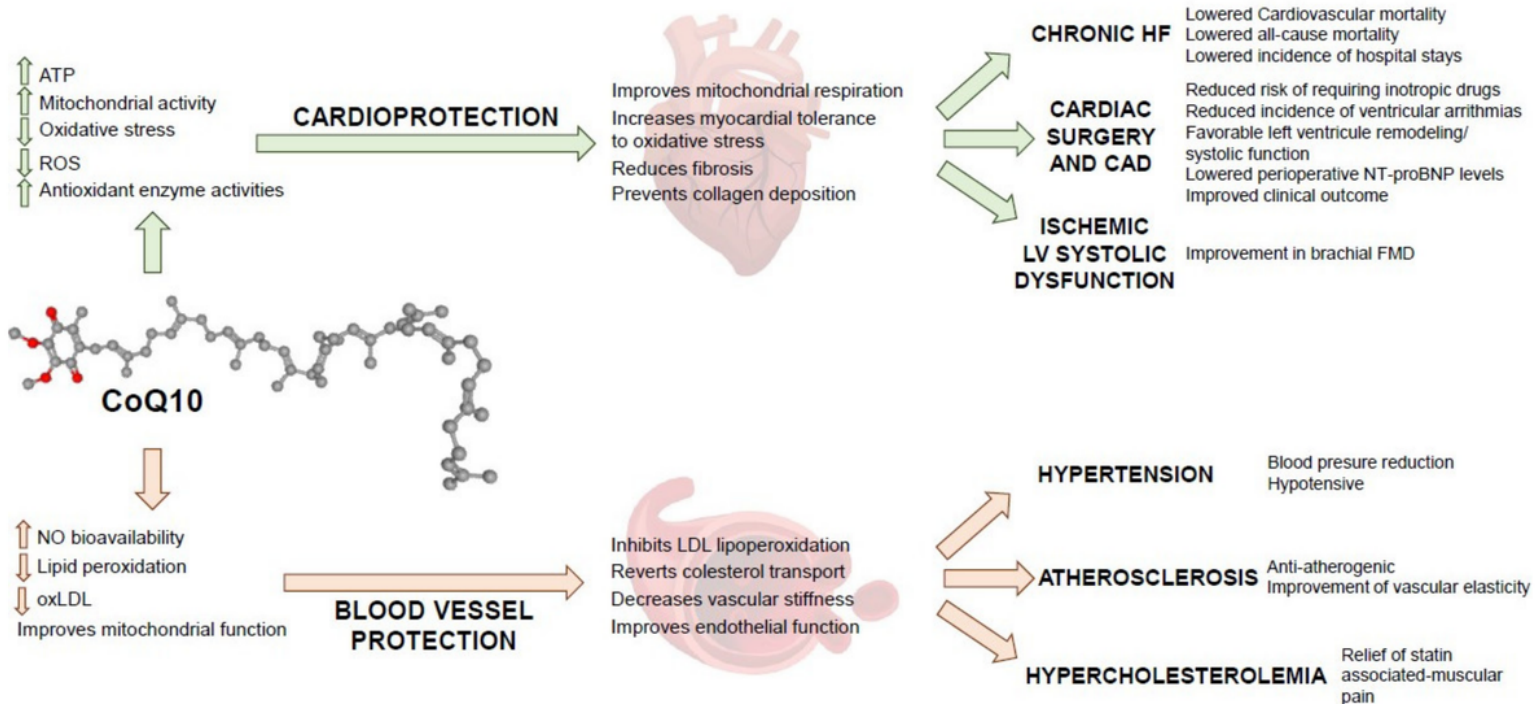
DOES COENZYME Q10 IMPROVE EXERCISE OR SPORTS PERFORMANCE?

JBIC 10/11 [90%]



*see appx

This systematic review evaluated the effectiveness of CoQ10 supplementation on physical performance and effects on inflammatory and oxidative factors, in a physically active population and specially in athletes.



KEY FINDINGS

58 studies included; 344 participants, 70-600mg/day

Dosing:

Most commonly dosed at 200-300mg/day.

Positive Effects Found:

Sports Performance (2/3 studies; 66%)

Exercise Performance (23/40; studies; 57%)

Oxidative Pattern (17/25; 68%)

Muscle Injury (5/14; 35%)

Inflammatory Pattern (6/7; 85%)

MAIN TAKEAWAYS

Use of Coenzyme Q10 seems help control oxidative patterns and helps anti-inflammatory activity at the cellular level in response to exercise.

Coenzyme Q10 may be a protective and recuperative substance rather than an ergogenic substance.

Coenzyme Q10 is a promising molecule in terms of its qualities and safety profile.

GIVE US YOUR FEEDBACK!

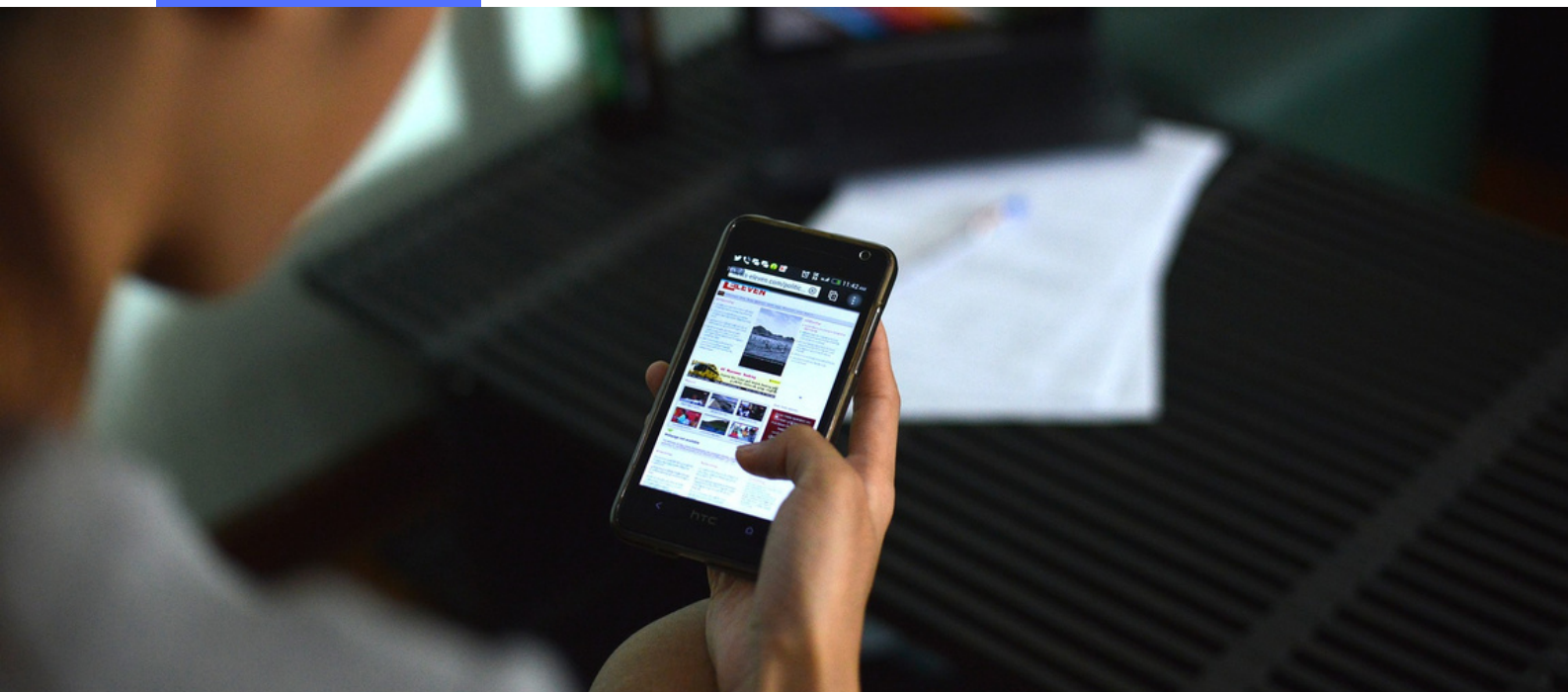
MEMBERS

We are on a mission to make research more accessible, easier to interpret, and quicker to implement.

Help us by giving 1 minute of your time to leave feedback for us.

We would greatly appreciate any feedback you have, as it helps us continually improve!

[Leave Review](#)



JBI CRITICAL APPRAISAL CHECKLIST FOR SYSTEMATIC REVIEWS AND RESEARCH SYNTHESSES

Author: Mortoni et al. Year: 2017

	Yes	No	Unclear	Not applicable
1. Is the review question clearly and explicitly stated?	+	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Were the inclusion criteria appropriate for the review question?	+	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Was the search strategy appropriate?	+	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Were the sources and resources used to search for studies adequate?	+	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Were the criteria for appraising studies appropriate?	+	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Was critical appraisal conducted by two or more reviewers independently?	+	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Were there methods to minimize errors in data extraction?	+	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Were the methods used to combine studies appropriate?	+	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Was the likelihood of publication bias assessed?	+	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Were recommendations for policy and/or practice supported by the reported data?	+	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Were the specific directives for new research appropriate?	+	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Overall appraisal: 11/11 (100%)

LIMITATIONS:

Lack of RET research in older individuals has led to inconclusive recommendations focusing on older individuals.

Only included studies with participants that were at or above their energy requirements, which may have omitted the significant impact protein has during periods of weight loss with RET.

JBI CRITICAL APPRAISAL CHECKLIST FOR SYSTEMATIC REVIEWS AND RESEARCH SYNTHESSES

Author: Jakubowski et al. Year: 2020

	Yes	No	Unclear	Not applicable
1. Is the review question clearly and explicitly stated?	+	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Were the inclusion criteria appropriate for the review question?	+	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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Overall appraisal: 11/11 (100%)

LIMITATIONS:

Small number of studies included

Variability between RET protocols might be another limiting factor.

JBI CRITICAL APPRAISAL CHECKLIST FOR SYSTEMATIC REVIEWS AND RESEARCH SYNTHESSES

Author: Drobnic et al. Year: 2022

	Yes	No	Unclear	Not applicable
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2. Were the inclusion criteria appropriate for the review question?	+	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Was the search strategy appropriate?	+	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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8. Were the methods used to combine studies appropriate?	+	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Was the likelihood of publication bias assessed?	<input type="checkbox"/>	✗	<input type="checkbox"/>	<input type="checkbox"/>
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