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REVIEW

# Whey protein supplementation in association with resistance training on additional muscle strength gain in older adults: A meta-analysis

## *Supplémentation en protéines solubles du lait (lactosérum) associée à un entraînement en musculation chez des sujets âgés : une méta-analyse*

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**KEYWORDS**
Exercise;
Supplements and functional foods;
Body composition

**Summary**
*Objective.* — To examine the effects of whey protein supplementation in association with resistance training on additional muscle strength gain in older adults.
*News.* — Data concerning the effect of dietary interventions are emerging in the literature as a promising co-adjuvant intervention to potentiate muscle mass and strength gains. Whey protein concentrate may represent an ideal protein source to promote muscle anabolism in older individuals undergoing resistance exercise However, randomized controlled trials (RCTs) show contradictory results. Systematic review or meta-analysis has never been performed to investigate the effects of whey protein supplementation in additional muscle strength gain in elderly engaged in resistance exercise training.
*Prospects and projects.* — Future investigations in effects of whey protein supplementation on muscle strength in older adults are needed to support the findings presented in the current review.

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*Conclusions*. — Whey protein supplementation in association with resistance exercise training did not contribute to additional gain of muscle strength in the older adults.


**MOTS CLÉS**
Exercice ;
Suppléments et aliments fonctionnels ;
Composition corporelle

**Résumé**
*Objectifs*. — Cette étude a consisté à évaluer les effets de la supplémentation en protéines solubles du lait (lactosérum) sur les réponses des performances musculaires à l'entraînement en musculation chez des sujets avançant en âge.
*Contribution originale*. — De nombreuses données suggèrent que les interventions nutritionnelles sont importantes pour potentialiser les effets de programmes d'entraînement sur la masse musculaire et la force développée. Les protéines du lactosérum (« whey » protéines) sont susceptibles de représenter une source de protéines importante pour promouvoir l'anabolisme musculaire chez des sujets avançant en âge à qui on propose des exercices de musculation adaptés. Cependant, les résultats des études randomisées contrôlées ne sont pas tous concordants. Le but de cet article est de proposer une méta-analyse des effets de la supplémentation en protéines du lactosérum sur les réponses de la force musculaire à un entraînement en musculation adaptée chez des sujets âgés.
*Perspectives*. — Les conclusions de cette méta-analyse restent provisoires et doivent être confortées par des expérimentations complémentaires à développer dans le futur.
*Conclusions*. — En l'état actuel des résultats publiés, la supplémentation en protéines du lactosérum ne semble pas majorer les réponses de la force à un entraînement adapté en renforcement musculaire chez des personnes avançant en âge.


## 1. Introduction

One of the most noticeable effects of aging is the reduction of skeletal muscle mass and strength. In older adults, these losses are associated with functional decline, disability, poor quality of life, institutionalization, hospitalization and death [1,2].

Resistance exercise training is an effective intervention to delay progression of muscle loss and prolong independence among community-dwelling older adults [3—5]. In addition, dietary interventions, such as milk proteins supplementation, are emerging in the literature as a promising co-adjuvant intervention to potentiate muscle mass and strength gains of individuals engaged in exercise training programs [5].

Milk proteins contain two main sources of proteins, the caseins and whey. In practice, the advantage of amino acids contained in whey protein is the high absorption and availability, once it does not curd in the stomach [6]. It is well recognized that amino acids contained in whey protein may be responsible for its enhanced ability to stimulate muscle protein anabolism, particularly in older adults [7]. These properties seem to be interesting in the context of strength training and muscle recovery, especially in older adults. It is also known that strength is associated with neurological and muscle integrity, which also depends on nutritional status [8].

Systematic review or meta-analysis has never been performed to investigate the effects of whey protein supplementation in additional muscle strength gain in older adults engaged in resistance exercise training. The aim of this systematic review was to analyze the published RCTs that investigated the effects of whey protein supplementation in additional muscle strength gain in older adults engaged in resistance exercise training.

## 2. Methods

This review was planned and performed in accordance with Preferred reporting items for systematic reviews and meta-analyses (PRISMA) guidelines [9].

### 2.1. Eligibility criteria

This review included RCTs that studied the effects of whey protein supplementation in additional muscle strength gain in older adults engaged in resistance exercise training. To be eligible, the trial should have randomized older adults to, at least, one group of whey protein supplementation plus resistance exercise training. We excluded studies that enrolled older adults with chronic diseases. The main outcome was muscle strength, an important variable in clinical practice and rehabilitation of older adults. Studies were considered for inclusion regardless of language or size.

### 2.2. Search methods for identification of studies

We searched for references on Medline, Lilacs, Embase, SciELO, Cumulative index to nursing and allied health (CINAHL), PEDro, and the Cochrane Library up to June 2015 without language restrictions. A standard protocol was developed and whenever possible, a standardized vocabulary (Mesh term for Medline and Cochrane and Emtree for Embase) was used. Keywords and their synonymous were used to sensitize the search.

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