Search strategy for CINAHL

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| Search strategy |  |
| S1 | (MH "Dietary Proteins+") OR "protein" |
| S2 | “whey” |
| S3 | (MM "Leucine") OR "leucine" OR (MH "Amino Acids, Essential+") |
| S4 | (MM "Caseins") OR (MM "Dietary Proteins") OR (MM "Milk Proteins") OR "casein"  |
| S5 | (MH "Dietary Supplementation") OR "nutrition supplement\*"  |
| S6 | (MH "Nutrition+") OR "nutrition"  |
| S7 | (MH "Nutritional Status") OR "nutritional status"  |
| S8 | (MH "Nutritional Support+") OR "nutritional support" OR (MH "Home Nutritional Support")  |
| S9 | S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 |
| S10 | (MH "Muscle, Skeletal+") OR (MH "Muscle Weakness") OR (MM "Muscle Fibers") OR (MH "Muscle, Smooth+") OR (MM "Fat Free Mass") OR (MM "Myoglobin") OR (MM "Myosins") OR (MH "Muscle Proteins+") OR (MH "Muscular Disorders, Atrophic+") OR (MM "Muscle Hypertrophy (Physiology)") OR "muscle" OR (MH "Muscle Strength+") OR (MM "Muscular Atrophy") |
| S11 | (MH "Muscle Function (Iowa NOC)") OR "muscle function"  |
| S12 | "sarcopenia"  |
| S13 | (MM "Cachexia") OR "cachexia" OR (MH "Weight Loss+") OR (MH "Body Weight Changes+") OR (MM "Malnutrition") |
| S14 | S10 OR S11 OR S12 OR S13 |
| S15 | (MM "Frail Elderly") OR "frail elderly" OR (MM "Aged, Hospitalized") OR (MM "Aged, 80 and Over") |
| S16 | "frail"  |
| S17 | "elderly" |
| S18 | S15 OR S16 OR S17 |
| S19 | S9 AND S14 AND S18 |
| S20 | Limit S19 to English language |
| S21 | Limit S20 to yr=“1990-2015” |
| S22 | Limit S21 to age=“aged: 65+ years” |
| S23 | Limit S22 to source types=“to academic journals” |

Search strategy for Medline

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| Search strategy |  |
| S1 | Muscles OR Muscle strength |
| S2 | Muscle Weakness  |
| S3 | Muscle Hypotonia |
| S4 | Sarcopenia OR Body Composition OR Muscular Atrophy |
| S5 | Body weight changes |
| S6 | Weight gain |
| S7 | Weight loss |
| S8 | Cachexia |
| S9 | Physical activity.mp |
| S10 | S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9  |
| S11 | exp Dietary Proteins |
| S12 | exp leucine  |
| S13 | exp amino acids, essential |
| S14 | \*Dietary Proteins |
| S15 | exp egg proteins, dietary |
| S16 | exp milk proteins OR exp casein OR exp lactoalbumin OR exp lactoglobulins OR exp vegetable proteins |
| S17 | Nutrition.mp |
| S18 | exp Nutritional status |
| S19 | exp Nutritional support |
| S20 | exp Dietary Supplements |
| S21 | Nutrition supplement.mp |
| S22 | S11 OR S12 OR S13 OR S14 OR S15 OR S16 OR S17 OR S18 OR S19 OR S20 OR S21 |
| S23 | Elderly.mp OR Aged |
| S24 | Aging OR “Aged, 80 and over” OR older people.mp |
| S25 | old people.mp |
| S26 | Geriatrics |
| S27 | frail elderly.mp OR Frail Elderly |
| S28 | S23 OR S24 OR S25 OR S26 OR S27 |
| S29 | S10 AND S22 AND S28 |
| S30 | Limit S29 to yr=”1990-current” |
| S31 | Limit S30 to publication type=“randomized controlled trial” |
| S32 | Limit S31 to subject=“humans” |
| S33 | Limit S32 to subject=“all aged (65 years and older)” |
| S34 | Limit S33 to English language |

Search strategy for Pre-Medline

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| Search strategy |  |
| S1 | dietary protein.mp OR Dietary Proteins |
| S2 | protein intake.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] |
| S3 | whey.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] |
| S4 | leucine.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] |
| S5 | "amino acids".mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] |
| S6 | casein.mp. or Caseins/ |
| S7 | Nutrition.mp |
| S8 | nutrition status.mp. or Nutritional Status/ |
| S9 | nutrition support.mp. or Nutritional Support/ |
| S10 | dietary supplement.mp. or Dietary Supplements/ |
| S11 | S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9 OR S10 |
| S12 | muscle.mp. or Muscles/ |
| S13 | sarcopenia.mp. or Sarcopenia/ |
| S14 | "muscle wasting".mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] |
| S15 | "muscle loss".mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] |
| S16 | "physical activity".mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] |
| S17 | "body composition".mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] |
| S18 | S12 OR S13 OR S14 OR S15 OR S16 OR S17 |
| S19 | frail elderly.mp. or Frail Elderly/ |
| S20 | "Aged, 80 and over"/ or exp Aged/ |
| S21 | Elderly.mp |
| S22 | Aging OR aging.mp |
| S23 | S19 OR S20 OR S21 OR S22 |
| S24 | S11 AND S18 AND S23 |
| S25 | Limit S24 to yr=“1990-current” |
| S26 | Limit S25 to English language |
| S27 | Limit S26 to subjects=“humans” |
| S28 | Limit S27 to subjects=“all aged, 65 and over” |
| S29 | Limit S28 to publication type=“randomized controlled trial” |

Search strategy for BIOSIS Previews

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| --- | --- |
| Search Strategy |  |
| S1 | **TOPIC:** (protein) *OR* **TOPIC:** (leucine) *OR* **TOPIC:** (whey) *OR* **TOPIC:** (casein) *OR* **TOPIC:** ("essential amino acids") *OR* **TOPIC:** (nutrition) *OR* **TOPIC:** (nutritional status) *OR* **TOPIC:** (nutritional support) *OR* **TOPIC:** (nutrition supplement\*) *OR* **TOPIC:** (dietary supplement\*) |
| S2 | **TOPIC:** (muscle) *OR* **TOPIC:** ("physical activity") *OR* **TOPIC:** (sarcopenia) *OR* **TOPIC:** ("weight loss") *OR* **TOPIC:** (cachexia) |
| S3 | **TOPIC:** (elderly) *OR* **TOPIC:** (frail) *OR* **TOPIC:** (frailty) *OR* **TOPIC:** (aged) *OR* **TOPIC:** (aging) |
| S4 | S1 AND S2 AND S3 |
| S5 | **MAJOR CONCEPTS:** ( AGRICULTURE OR PARASITOLOGY OR ANIMAL HUSBANDRY OR PATHOLOGY OR CLIMATOLOGY OR COMPUTATIONAL BIOLOGY OR COMPUTER APPLICATIONS OR MORPHOLOGY OR ECOLOGY ENVIRONMENTAL SCIENCES OR ENVIRONMENTAL SCIENCES OR VETERINARY MEDICINE ) |
| S6 | S4 NOT S5 |
| S7 | **RESEARCH AREAS:** ( AGRICULTURE OR ALLERGY OR ANTHROPOLOGY OR AUDIOLOGY SPEECH LANGUAGE PATHOLOGY OR PALEONTOLOGY OR GOVERNMENT LAW OR BIODIVERSITY CONSERVATION OR HISTORY OR PHYSICS OR BUSINESS ECONOMICS OR INFORMATION SCIENCE LIBRARY SCIENCE OR INSTRUMENTS INSTRUMENTATION OR COMMUNICATION OR LEGAL MEDICINE OR LINGUISTICS OR EDUCATION EDUCATIONAL RESEARCH OR MATERIALS SCIENCE OR ENTOMOLOGY OR EVOLUTIONARY BIOLOGY OR VETERINARY SCIENCES ) |
| S8 | **S6 NOT S7** |
| S9 | S8 refined by **DOCUMENT TYPES**: (ARTICLE) |
| S10 | S9 refined by **LANGUAGES**: (ENGLISH) |
| S11 | S10 refined by **PUBLICATION YEARS**: (1990 OR 1991 OR 1992 OR 1993 OR 1994 OR 1995 OR 1996 OR 1997 OR 1998 OR 1999 OR 2000 OR 2001 OR 2002 OR 2003 OR 2004 OR 2005 OR 2006 OR 2007 OR 2008 OR 2009 OR 2010 OR 2011 OR 2012 OR 2013 OR 2014 OR 2015) |
| S12 | S12 refined by **TOPIC**: (“randomized controlled trial” OR “randomised controlled trial”)  |

Search strategy for Cochrane Library

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| --- | --- |
| Search strategy |  |
| S1 | “muscle” or “sarcopenia” or “cachexia” or "physical activity" or "body composition" in Title, Abstract, Keywords |
| S2 | “weight loss" or "weight change" in Title, Abstract, Keywords |
| S3 | S1 OR S2 |
| S4 | “nutrition” or “nutritional status” or dietary supplement\* or nutrition supplement\* in Title, Abstract, Keywords |
| S5 | “protein” or “whey” or “casein” or “leucine” or "essential amino acid" in Title, Abstract, Keywords |
| S6 | S4 OR S5 |
| S7 | “elderly” or “aging” or “aged” or "frail elderly" or “frailty” in Title, Abstract, Keywords |
| S8 | “older people” in Title, Abstract, Keywords |
| S9 | S7 OR S8 |
| S10 | S3 AND S6 AND S9 |
| S11 | Limit S10 to 1990-2015 |
| S12 | “infant” or “adolescent” or “middle aged” or “rat” or “animal” in Title, Abstract, Keywords |
| S13 | S11 NOT S12 |
| S14 | “child” or “preschooler” or “rodent” in Title, Abstract, Keywords |
| S15 | S13 NOT S14 |
| S16 | “randomised control trial” OR “randomised control trials” OR “randomised controlled trials” OR “randomised controlled trial” in Search All Text |
| S17 | S15 AND S16 |
| S18 | "cross sectional studies" or case control\* in Title, Abstract Keywords |
| S19 | S17 NOT S18 |

Search strategy for Pubmed

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| --- | --- |
| Search strategy |  |
| S1 | (protein or leucine or whey or casein or "essential amino acids" or nutrition\* or nutritional status or nutrition support or nutrition supplement\* or dietary supplement\*) |
| S2 | (muscle or "weight loss" or "physical activity" or sarcopenia or cachexia or "body composition") |
| S3 | (elderly or frail or frailty or aged or aging) |
| S4 | S1 AND S2 AND S3 |
| S5 | Limit to Publication date from 1990/01/01 to 2015/12/31  |
| S6 | Limit to Randomized Controlled Trial |
| S7 | Limit to Humans |
| S8 | Limit to Aged: 65+ years |
| S9 | Limit to English |
| S10 | (animals or rodent or mice or mouse or rat or rats or infant or infants or pre-schoolers or children or adolescent or middle aged) |
| S11 | S9 NOT S10 |

Search strategy for ProQuest central

|  |  |
| --- | --- |
| Search strategy |  |
| S1 | ("amino acid" OR "dietary protein" or "protein intake" OR whey OR casein OR leucine OR nutrition\* OR “nutritional status” OR “nutritional support” OR “nutrition supplement\*” OR “dietary supplement\*”) |
| S2 | (muscles OR sarcopenia OR cachexia OR "weight loss" OR "physical activity" OR "body composition") |
| S3 | (aged OR frail elderly OR aging OR frailty) |
| S4 | S1 AND S2 AND S3 |
| S5 | (animals OR "middle aged" OR animal OR rat OR rats OR mouse OR mice OR child OR children OR adolescent OR youth OR infant) |
| S6 | S4 NOT S5 |
| S7 | Narrowed by **Document type:** Article |
| S8 | Narrowed by **Source type:** Scholarly Journals  |
| S9 | Narrowed by **Publication date:** 01/01/1990 – 31/12/2015 |
| S10 | Narrowed by **Language**: English |
| S11 | Narrowed by **Subject:** humans NOT cross-sectional studies AND cohort studies  |
| S12 | S11 AND (“randomized controlled trial\*” OR “randomised controlled trial\*” OR “randomized control trial\*” OR “randomised control trial\*”) |

Search strategy for EBM Reviews

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| --- | --- |
| Search strategy |  |
| S1 | (protein or whey or casein or leucine or "essential amino acid" or nutrition\* or “nutritional status” or “nutrition support” or “nutrition supplement\*” or “dietary supplement\*”).mp. [mp=title, short title, abstract, full text, keywords, caption text] |
| S2 | (“weight change” or “weight loss” or cachexia or sarcopenia or muscle or “body composition” or “physical activity”).mp. [mp=title, short title, abstract, full text, keywords, caption text] |
| S3 | (aged or aging or elderly or frailty or "frail elderly" or "older people").mp. [mp=title, short title, abstract, full text, keywords, caption text] |
| S4 | S1 AND S2 AND S3 |
| S5 | Limit S4 to subject=“all aged, 65 and over” |
| S6 | Limit S5 to yr=“1990-current” |
| S7 | Limit S6 to subject=“humans” |
| S8 | Limit S7 to publication type=“randomized controlled trial” |

Search strategy for Scopus

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| --- | --- |
| Strategy |  |
| S1 | TITLE-ABS-KEY("protein intake" OR "dietary protein" OR whey OR casein OR leucine OR "essential amino acid" OR nutrition\* OR “nutritional status” OR “nutritional support” OR “nutrition supplement\*” OR “dietary supplement\*”) |
| S2 | TITLE-ABS-KEY(muscle OR "weight loss" OR "weight change" OR "physical activity" OR "body composition" OR sarcopenia OR cachexia) |
| S3 | TITLE-ABS-KEY(elderly OR frail OR older OR aging OR aged OR frailty) |
| S4 | S1 AND S2 AND S3 |
| S5 | Limit S4 to yr=“1990 OR 1991 OR 1992 OR 1993 OR 1994 OR 1995 OR 1996 OR 1997 OR 1998 OR 1999 OR 2000 OR 2001 OR 2002 OR 2003 OR 2004 OR 2005 OR 2006 OR 2007 OR 2008 OR 2009 OR 2010 OR 2011 OR 2012 OR 2013 OR 2014 OR 2015” |
| S6 | Limit S5 to document type=“article” |
| S7 | Limit S6 to source type=“journals” |
| S8 | Limit S7 to language=“English” |
| S9 | Exclude subject areas=“veterinary OR economics, econometrics and finance OR physics and astronomy OR computer sciences OR materials science OR earth and planetary sciences OR dentistry OR engineering OR business, management and accounting OR chemical engineering OR environmental science OR mathematics OR social sciences OR agricultural and biological sciences” from S8 |
| S10 | Exclude keywords=“adolescent OR animals OR child OR young adult OR nonhuman OR animal food OR animal feed OR school child OR child, preschool OR animal experiment OR preschool child OR animalia OR animal tissue OR cross-sectional studies OR cross-sectional study OR cohort studies OR case report OR cohort analysis OR retrospective studies OR case-control studies OR logistic models OR correlation analysis” from S9 |
| S11 | Limit S10 to keywords=“randomized controlled trial” |
| S12 | Limit S11 to keywords=“humans OR human” |

Search strategy for Embase

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| --- | --- |
| Search strategy |  |
| S1 | 'protein intake'/exp OR 'protein intake' OR 'milk protein'/exp OR 'milk protein' OR 'casein'/exp OR 'casein' OR 'leucine'/exp OR 'leucine' OR 'essential amino acid'/exp OR 'essential amino acid' OR 'nutrition'/exp OR 'nutrition' OR 'nutritional status'/exp OR 'nutritional status' OR 'nutritional support'/exp OR 'nutritional support' OR 'nutrition supplement' OR 'dietary supplementation'/exp OR 'dietary supplementation' |
| S2 | muscle OR 'muscle weakness' OR 'muscle atrophy' OR 'body composition' OR 'physical activity' OR 'weight change' OR 'weight reduction' OR 'wasting syndrome' OR 'cachexia' OR 'muscle strength' |
| S3 | 'aged' OR 'aged hospital patient' OR 'aging' OR 'frail elderly' OR 'very elderly' |
| S4 | S1 AND S2 AND S3 |
| S5 | Limit S4 to publication year=“1990-2015” |
| S6 | Limit S5 to age=“aged OR very elderly” |
| S7 | Limit S6 to study types=“randomized controlled trial” |
| S8 | Limit S7 to language=“English” |
| S9 | Limit S8 to study types=“humans” |
| S10 | Limit S9 to publication types=“article” |