



DOSSIER · SUBSTANCE

Maca (Lepidium Meyenii)

Maca is the root of an Andean Brassicaceae; controlled studies show improvements in menopausal symptoms, libido and mood.

116

STUDIES IN
TOTAL

27

IN HUMANS

18

OF WHICH
CONTROLLED

13

IN ANIMALS

13

IN THE LAB

Figures from the IHR study database · Last updated 2026-10-15

How to Read This Dossier

ESTABLISHED

measured in humans, with a comparison group

PLAUSIBLE

supported by mechanism, animal studies or observation

HYPOTHESIS

a likely connection that still needs to be tested

Maca (Lepidium Meyenii) at a Glance

For menopausal symptoms, a systematic review and a randomized controlled trial found lower scores on Kupperman and Greene scales; the review rates the evidence as limited ⁸¹⁶.

Two controlled studies found an improved Kupperman index ¹⁰²⁰.

In men, two controlled studies found a greater improvement in erectile function with maca than with placebo, and another found increased sexual desire ¹¹¹⁴²³.

Regarding sperm concentration, the picture is inconsistent: one controlled study found a higher sperm concentration ¹², while a meta-analysis and another controlled study found no difference ⁵¹³.

We evaluated 36 human studies on Maca (Lepidium meyenii), including 15 randomised controlled trials and 8 meta-analyses or systematic reviews; the controlled studies include 802 participants in total. As of 14 October 2026.

1. What Is Maca (Lepidium Meyenii)? Occurrence, Origin and Forms

Maca is a cruciferous plant (Brassicaceae) cultivated in the highlands of the Andes. Its main use is the thickened root, which is eaten dried as a food. Traditionally, it is regarded in its region of origin as a food and a tonic, mentioned in connection with fertility, energy and well-being during menopause.

Maca thrives at high altitude on poor soils of the Andes and is cultivated there as a crop. Outside that region it is grown as a crop only in a few places.

The root is harvested, dried and processed into powder or flour; for supplements it is additionally heated (gelatinized) or processed into extracts. Human studies mainly use dried root powder, gelatinized powder, and aqueous or alcoholic extracts.

Forms and Preparations Studied

- Dried root powder
 - Gelatinized powder (heated material)
 - Aqueous extract
 - Alcoholic extract
 - Root colour types: yellow, red, black
 - Maca flour as a food
- Not covered on this page:
- Other Lepidium species, such as garden cress (Lepidium sativum)
 - Preparations combining maca with other ingredients (mixtures)
 - Other root and tuber crops used in a similar way, such as ginseng

2. What Does Maca (Lepidium Meyenii) Do? Results by Area

AREA	RESULT IN CONTROLLED STUDIES	STRENGTH OF EVIDENCE	STUDIES	PARTICIPANTS
Sexual Function and Libido	mostly improved	moderate	1 meta-analyses · 5 controlled · 6 other	189
Menopausal Symptoms	mostly improved	moderate	1 meta-analyses · 5 controlled · 2 other	265
Semen Quality and Male Fertility	mostly no difference	moderate	2 meta-analyses · 3 controlled · 5 other	139
Mood and Psychological Well-Being	mostly improved	moderate	0 meta-analyses · 3 controlled · 3 other	225
Fatigue and Exhaustion	mostly improved	low	0 meta-analyses · 1 controlled · 2 other	175
Other investigations	mixed	high	2 meta-analyses · 14 controlled · 7 other	668

How to read the table: counted are human studies whose results concern the area. “High” means at least one meta-analysis and two controlled studies showing improvement, or at least three controlled studies of which three quarters show improvement, with at least 300 participants in total. “Moderate” means at least two controlled studies showing improvement, as a majority, or one meta-analysis alongside controlled studies. “Low” means one controlled study showing improvement. Where an area has no controlled study, the strength of evidence is at most “low” (result “reviews only” or “observational data only”). Everything else is “unclear”. A study counts as showing improvement when at least half of its outcomes in this area improved. Reviews of combination products do not count as meta-analyses; results that only describe side effects or shares of users do not count as an effect. The same study is counted only once.

3. What the Studies Show in Detail

Maca (Lepidium Meyenii), Sexual Function and Libido: Human Studies

In men with symptoms of late-onset hypogonadism, gelatinized maca improved erectile function more than placebo ¹¹. In men with mild erectile dysfunction, the IIEF-5 score increased more with a dry extract than with placebo; the effect was small ¹⁴. In women with antidepressant-induced sexual dysfunction, the remission rate was higher with maca than with placebo, especially in postmenopausal women ¹⁵. In a dose-comparison study, sexual function improved only with the higher dose, not with the lower one ¹⁹. A randomized controlled trial in postmenopausal women found an improvement in sexual dysfunction ²¹. Another randomized controlled trial in healthy men found increased sexual desire ²³. The findings are predominantly based on dried root powder and gelatinized powder, the individual studies are small and short, and a meta-analysis on herbal agents for erectile dysfunction provides no clear result specifically for maca ¹.

STUDY	DESIGN · PARTICIPANTS	PREPARATION · DOSE · DURATION · COMPARISON
¹ Borrelli et al. 2018	meta-analysis · 2,080 participants	Herbal dietary supplements, including Lepidium meyenii (n=50); vs. Placebo or other herbal treatments
¹¹ Shin et al. 2023	randomised controlled · 80 participants	Gelatinized Maca (Lepidium meyenii); 1,000 mg three times daily before food; 12 weeks; vs. Placebo
¹⁴ Zenico et al. 2009	randomised controlled · 50 participants	Maca dry extract; 2400 mg; 12 weeks; vs. Placebo
¹⁵ Dording et al. 2015	randomised controlled · 45 participants	Maca root (dried powder); 3.0 g/day; 12 weeks; vs. Placebo
¹⁹ Dording et al. 2008	study · 20 participants	Maca root (L. meyenii); 1.5 g/day or 3.0 g/day; vs. Low dose (1.5 g/day) versus high dose (3.0 g/day)
²¹ Brooks et al. 2008	randomised controlled · 14 participants	Maca root powder (Lepidium meyenii); 3.5 g/day; 6 weeks Maca, 6 weeks placebo (crossover, 12 weeks); vs. placebo, r
²³ Gonzales et al. 2002	randomised controlled	Maca Gelatinizada; 1,500 mg or 3,000 mg daily; 12 weeks; vs. Placebo
²⁶ Ross et al. 2024	case series · 2 participants	Maca-OG™, gelatinized, highly bioavailable powder of specific phenotypes

Further studies in this area: ²⁸ ³² ³³ ³⁴

Maca (Lepidium Meyenii) and Menopausal Symptoms: Human Studies

For menopausal symptoms, a systematic review and a randomized controlled trial found lower scores on Kupperman and Greene scales; the review rates the evidence as limited ⁸¹⁶. Two randomized controlled trials found an improved Kupperman index ¹⁰²⁰. Two randomized controlled trials reported a decrease in hot flashes and night sweats ¹⁰¹⁶, one randomized controlled trial reported an improvement in depressive mood ¹⁷ and another reported higher estradiol, FSH and progesterone levels ²⁰. For the remaining laboratory values, one randomized controlled trial found no difference ¹⁷. Predominantly gelatinized powder was examined, as well as dried root powder of the maca root; the studies were small and short, and information on the ecotype of the root and on manufacturer funding is mostly missing.

STUDY	DESIGN · PARTICIPANTS	PREPARATION · DOSE · DURATION · COMPARISON
⁸ Lee et al. 2011	systematic review	maca-based intervention (form not reported); vs. placebo
¹⁰ Meissner et al. 2006	randomised controlled · 168 participants	Pre-gelatinized organic maca (Maca-GO) in capsules; 2 × 500 mg twice daily with meals, total 2 g/day; three (Trial I,
¹⁶ Meissner et al. 2006	randomised controlled · 34 participants	Pre-gelatinized organic maca (Maca-GO) capsules; Two 500 mg capsules twice daily with meals, 2 g/day; four mon

STUDY	DESIGN · PARTICIPANTS	PREPARATION · DOSE · DURATION · COMPARISON
¹⁷ Stojanovska et al. 2015	randomised controlled · 29 participants	Maca (Lepidium meyenii); 3.3 g/day; 6 weeks each phase, 12 weeks total; vs. placebo, randomized double-blind cro
²⁰ Meissner et al. 2006	randomised controlled · 20 participants	Pre-gelatinized organic Maca (Maca-GO), capsules; 2 × 500 mg twice daily, total 2 g/day; 4 months, crossover after
²¹ Brooks et al. 2008	randomised controlled · 14 participants	Maca root powder (Lepidium meyenii); 3.5 g/day; 6 weeks Maca, 6 weeks placebo (crossover, 12 weeks); vs. placet
²⁸ Ulloa et al. 2024	review	Maca preparations of varying form and processing
³⁰ Depypere et al. 2014	review	Lepidium meyenii (Maca) extracts; vs. Placebo (RCTs)

Maca (Lepidium Meyenii), Semen Quality and Male Fertility: Human Studies

On sperm quality and male fertility, several controlled studies and two review articles are available that do not show a uniform picture. A randomized controlled trial reported a higher sperm concentration in men with mild astheno- and/or oligozoospermia taking 2 g of maca daily than with placebo ¹². For sperm motility, semen volume and normal sperm morphology, the same study found no difference ¹². A small randomized controlled pilot study in healthy men saw only increasing trends compared with placebo for sperm concentration and motility ¹⁸. Another randomized controlled trial with yellow maca powder found no difference in sperm concentration in infertile men ¹³. A systematic review reports better sperm motility in infertile men and better semen quality parameters in healthy men ⁷, while a meta-analysis shows no difference in sperm concentration and unclear results for semen quality parameters ⁵. The findings come predominantly from small, short studies in different populations; the forms used range from dried root powder to gelatinized powder to preparations not further specified, and the evidence is inconsistent regarding ecotypes, amount and duration of use.

STUDY	DESIGN · PARTICIPANTS	PREPARATION · DOSE · DURATION · COMPARISON
⁵ Lee et al. 2022	meta-analysis	Maca (Lepidium meyenii), form not reported; vs. Placebo
⁷ Lee et al. 2016	systematic review	Maca (Lepidium meyenii), form not specified; vs. Placebo or baseline (3 RCTs, 2 uncontrolled observational studies)
¹² Alcalde et al. 2020	randomised controlled · 69 participants	Maca (Lepidium meyenii), form not specified; 2 g/day; 12 weeks; vs. Placebo
¹³ Melnikovova et al. 2021	randomised controlled · 50 participants	Yellow maca (Lepidium meyenii Walpers); 16 weeks; vs. Placebo
¹⁸ Melnikovova et al. 2015	randomised controlled · 20 participants	milled maca hypocotyl or placebo; 1.75 g/day; 12 weeks; vs. placebo, double-blind randomized
²⁶ Ross et al. 2024	case series · 2 participants	Maca-OG™, gelatinized, highly bioavailable powder of specific phenotypes
²⁹ Abarikwu et al. 2020	review	Lepidium meyenii and other medicinal plants
³² Gonzales et al. 2012	review	Maca (Lepidium meyenii), form not specified

Further studies in this area: ³⁴ ³⁵

Maca (Lepidium Meyenii), Mood and Psychological Well-Being: Human Studies

A randomized controlled trial with aqueous extract of black or red maca found better mood in adults at low and high altitude ⁹. Another randomized controlled trial with maca dry extract found a greater increase in the score for mental performance in the satisfaction profile SAT-P in men with mild erectile dysfunction than with placebo ¹⁴. In contrast, a randomized controlled trial with gelatinized powder (Maca Gelatinizada) found no difference in depression and anxiety in healthy men ²³. The evidence is moderate; the findings come from three controlled studies with a total of 225 participants that investigated different forms and ecotypes, and no meta-analysis is available.

STUDY	DESIGN · PARTICIPANTS	PREPARATION · DOSE · DURATION · COMPARISON	RESULT
⁹ Gonzales-Arimborgo et al. 2016	randomised controlled · 175 participants	spray-dried extracts of black or red maca; 3 g daily; 12 weeks; vs. placebo	mood: improved
¹⁴ Zenico et al. 2009	randomised controlled · 50 participants	Maca dry extract; 2400 mg; 12 weeks; vs. Placebo	SAT-P psychological
²³ Gonzales et al. 2002	randomised controlled	Maca Gelatinizada; 1,500 mg or 3,000 mg daily; 12 weeks; vs. Placebo	Hamilton test for de
²⁶ Ross et al. 2024	case series · 2 participants	Maca-OG™, gelatinized, highly bioavailable powder of specific phenotypes	Mood: improved
²⁸ Ulloa et al. 2024	review	Maca preparations of varying form and processing	subjective wellbein
³⁴ Gonzales et al. 2009	review	Maca as powder, capsules, pills, flour, liquor, extracts; vs. Placebo in randomized clinical trials	mood: improved; ar

Maca (Lepidium Meyenii), Fatigue and Exhaustion: Human Studies

A randomized controlled trial with 175 adults at low and high altitude found better energy with an aqueous extract of black or red maca compared with placebo ⁹. A case series reports more energy with gelatinized powder in one of two men with andropause and sperm dysfunction ²⁶. A review article mentions favorable effects on energy and mood ³⁴. The evidence is low, as only one controlled study is available and the remaining observations have no control group. An aqueous extract and gelatinized powder were investigated, but not the raw root as a food; effects with longer use and with other preparations remain open.

STUDY	DESIGN · PARTICIPANTS	PREPARATION · DOSE · DURATION · COMPARISON	RESULT
⁹ Gonzales-Arimborgo et al. 2016	randomised controlled · 175 participants	spray-dried extracts of black or red maca; 3 g daily; 12 weeks; vs. placebo	energy: improved
²⁶ Ross et al. 2024	case series · 2 participants	Maca-OG™, gelatinized, highly bioavailable powder of specific phenotypes	Energy: improved
³⁴ Gonzales et al. 2009	review	Maca as powder, capsules, pills, flour, liquor, extracts; vs. Placebo in randomized clinical trials	energy: improved

Maca (Lepidium Meyenii): Further Outcomes in Studies

In this area, 14 controlled studies with a total of 668 participants as well as two meta-analyses and two systematic reviews were examined. Several controlled studies found improvements in blood pressure values after dried root powder or gelatinized powder ¹⁷²⁰. Several controlled studies also found improved blood lipid values after gelatinized powder ¹⁰²⁰. For hormones, a mixed picture emerged: Two controlled studies found higher estradiol and lower FSH values after gelatinized powder ¹⁰¹⁶, while several controlled studies found no differences in serum hormones ¹⁸²¹²²²³. One controlled study reported a decrease in free testosterone ¹³. The studies are heterogeneous with regard to the maca form used, the ecotype, and the number of participants, and several investigations include only small samples.

STUDY	DESIGN · PARTICIPANTS	PREPARATION · DOSE · DURATION · COMPARISON
² Huerta et al. 2024	meta-analysis	Maca (Lepidium meyenii Walp.) supplementation; higher doses showed greater effect (dose-response effect); vs. C
³ Huerta et al. 2024	meta-analysis	Lepidium meyenii Walp (Maca), including macamides; higher dose produced greater antioxidant effect; vs. control g
⁴ Morgado et al. 2024	systematic review	27 proposed testosterone boosters, including Lepidium meyenii; vs. Placebo
⁶ Brunetti et al. 2020	systematic review	Lepidium meyenii Walp. (maca) as herbal aphrodisiac

STUDY	DESIGN · PARTICIPANTS	PREPARATION · DOSE · DURATION · COMPARISON
⁹ Gonzales-Arimborgo et al. 2016	randomised controlled · 175 participants	spray-dried extracts of black or red maca; 3 g daily; 12 weeks; vs. placebo
¹⁰ Meissner et al. 2006	randomised controlled · 168 participants	Pre-gelatinized organic maca (Maca-GO) in capsules; 2 × 500 mg twice daily with meals, total 2 g/day; three (Trial I
¹¹ Shin et al. 2023	randomised controlled · 80 participants	Gelatinized Maca (Lepidium meyenii); 1,000 mg three times daily before food; 12 weeks; vs. Placebo
¹³ Melnikovova et al. 2021	randomised controlled · 50 participants	Yellow maca (Lepidium meyenii Walpers); 16 weeks; vs. Placebo

Further studies in this area: [14](#) [16](#) [17](#) [18](#) [20](#) [21](#) [22](#) [23](#) [24](#) [25](#) [26](#) [27](#) [28](#) [31](#) [34](#)

4. How Is Maca (Lepidium Meyenii) Dosed? Preparation, Dose and Duration in Studies

The studies predominantly used dried root powder and gelatinized powder, as well as aqueous and alcoholic extracts. Individual investigations examined specific ecotypes such as yellow, red or black maca. The amounts administered can be found in the table.

PREPARATION OR FORM	DOSE	DURATION	STUDY
spray-dried extracts of black or red maca	3 g daily	12 weeks	⁹
Pre-gelatinized organic maca (Maca-GO) in capsules	2 × 500 mg twice daily with meals, total 2 g/day	three (Trial I, n=102) or four (Trial II, n=66) months	¹⁰
Gelatinized Maca (Lepidium meyenii)	1,000 mg three times daily before food	12 weeks	¹¹
Maca (Lepidium meyenii), form not specified	2 g/day	12 weeks	¹²
Yellow maca (Lepidium meyenii Walpers)	—	16 weeks	¹³
Maca dry extract	2400 mg	12 weeks	¹⁴
Maca root (dried powder)	3.0 g/day	12 weeks	¹⁵
Pre-gelatinized organic maca (Maca-GO) capsules	Two 500 mg capsules twice daily with meals, 2 g/day	four months, crossover, outpatient	¹⁶
Maca (Lepidium meyenii)	3.3 g/day	6 weeks each phase, 12 weeks total	¹⁷
milled maca hypocotyl or placebo	1.75 g/day	12 weeks	¹⁸
Pre-gelatinized organic Maca (Maca-GO), capsules	2 × 500 mg twice daily, total 2 g/day	4 months, crossover after 2 months	²⁰
Maca root powder (Lepidium meyenii)	3.5 g/day	6 weeks Maca, 6 weeks placebo (crossover, 12 weeks)	²¹
Maca Gelatinizada	1500 mg or 3000 mg per day	12 weeks	²²
Maca Gelatinizada	1,500 mg or 3,000 mg daily	12 weeks	²³
Lepidium meyenii extract (form unspecified)	2.25 g twice daily	12 weeks	²⁴

5. Is Maca (Lepidium Meyenii) Safe? Side Effects in Studies

In the studies, maca was predominantly well tolerated; one placebo-controlled study reported no serious side effects ⁹¹⁵¹⁹. A review reports rare side effects and good tolerability at therapeutic dose, but points to risks with overdose or self-medication ⁶²⁸. A case report mentions an elevated blood lead concentration ²⁷.

STUDY	REPORTED SIDE EFFECTS
¹ Borrelli et al. 2018	Recorded in 19 of 24 trials, no significant differences vs placebo
⁶ Brunetti et al. 2020	Psychiatric and neurological adverse effects; mostly safe at therapeutic doses, risks with overdose or self-medication

STUDY	REPORTED SIDE EFFECTS
⁸ Lee et al. 2011	safety not proven
⁹ Gonzales-Arimborgo et al. 2016	good acceptability, no serious adverse effects
¹¹ Shin et al. 2023	Maca called safe, no figures reported
¹⁵ Dording et al. 2015	Maca was well tolerated
¹⁹ Dording et al. 2008	Maca was well tolerated
²⁰ Meissner et al. 2006	Rat toxicity safe at 7.5 mg/kg body weight
²⁷ Johnson-Arbor et al. 2018	whole blood lead concentration 44 µg/dL
²⁸ Ulloa et al. 2024	generally safe, rare adverse effects, good tolerance

6. What Remains Open: Limits of the Evidence

- Most studies are small and short; information on ecotype and manufacturer funding is often missing.
- The forms and preparations used differ greatly, which makes comparison difficult.
- Regarding semen quality, the results are inconsistent and the evidence is heterogeneous.
- Long-term effects and effects with longer use are hardly studied.
- Combination products with other ingredients do not allow any statement about maca alone.

7. Bottom Line: What Is Established About Maca (Lepidium Meyenii)

Maca is the thickened root of the Andean Brassicaceae *Lepidium meyenii*, which has been studied dried as a food and in various preparations. Controlled human studies show improvements in menopausal symptoms, sexual function and libido, as well as in mood and energy. The strength of evidence is moderate for menopausal symptoms, sexual function and mood, and low for fatigue. For semen quality, the picture is inconsistent. The studies are predominantly small and short, and the forms, ecotypes and amounts used vary greatly.

Frequently Asked Questions

How well has Maca (*Lepidium meyenii*) been studied in humans?

We evaluated 36 human studies on Maca (*Lepidium meyenii*), including 15 randomised controlled trials and 8 meta-analyses or systematic reviews; the controlled studies include 802 participants in total. As of 14 October 2026.

Does Maca (*Lepidium meyenii*) help with sexual Function and Libido? What the studies show

We evaluated one meta-analysis or systematic review, 5 controlled studies and 6 further studies; the controlled studies include 189 participants in total. Result of the controlled studies: mostly improved. Strength of evidence under our published rules: moderate. Sources: [1111415](#)

Does Maca (*Lepidium meyenii*) help with menopausal Symptoms? What the studies show

We evaluated one meta-analysis or systematic review, 5 controlled studies and 2 further studies; the controlled studies include 265 participants in total. Result of the controlled studies: mostly improved. Strength of evidence under our published rules: moderate. Sources: [8101617](#)

Does Maca (*Lepidium meyenii*) help with semen Quality and Male Fertility? What the studies show

We evaluated 2 meta-analyses or systematic reviews, 3 controlled studies and 5 further studies; the controlled studies include 139 participants in total. Result of the controlled studies: mostly no difference. Strength of evidence under our published rules: moderate. Sources: [571213](#)

Does Maca (*Lepidium meyenii*) help with mood and Psychological Well-Being? What the studies show

We evaluated 3 controlled studies and 3 further studies; the controlled studies include 225 participants in total. Result of the controlled studies: mostly improved. Strength of evidence under our published rules: moderate. Sources: [9142326](#)

Does Maca (*Lepidium meyenii*) help with fatigue and Exhaustion? What the studies show

We evaluated one controlled study and 2 further studies; the controlled studies include 175 participants in total. Result of the controlled studies: mostly improved. Strength of evidence under our published rules: low. Sources: ⁹²⁶³⁴

Which forms of maca were examined in the studies?

Primarily dried root powder and gelatinized powder were examined, as well as aqueous and alcoholic extracts. Individual studies examined specific ecotypes such as yellow, red or black maca. The amounts administered can be found in the table.

Do studies in humans show an effect on menopausal symptoms?

A systematic review and a randomized controlled trial found lower scores on Kupperman and Greene scales; the review rates the evidence as limited ⁸¹⁶. Two controlled studies found an improved Kupperman index ¹⁰²⁰. However, the studies were small and short.

How does maca affect sexual function?

Two controlled studies found a greater improvement in erectile function in men with maca than with placebo ¹¹¹⁴. In women with antidepressant-induced sexual dysfunction, the remission rate was higher with maca, especially after menopause ¹⁵. A study in postmenopausal women found an improvement in sexual dysfunction ²¹. Another study in healthy men found increased sexual desire ²³.

Are there side effects or risks?

In the studies, maca was predominantly well tolerated; one placebo-controlled study reported no serious side effects ⁹¹⁵¹⁹. A review reports rare side effects and good tolerability at therapeutic dose, but points to risks with overdose or self-medication ⁶²⁸. A case report mentions an elevated blood lead concentration ²⁷.

What should be considered with combination products?

Combination products that combine maca with other ingredients do not allow any statement about the effect of maca alone. A review on testosterone boosters ⁴ and one on ingredients such as macamides ³ do not consider maca alone. Such results do not apply to maca as a single product.

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Research, put in context. Every statement leads to the original paper; the decision in the individual case rests with the treating professional.
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