Examine

# Libido & Sexual Function Supplement Guide



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### Introduction

In this guide, we will address two aspects of sexuality: <u>libido</u> (or sex drive: the general desire for sex) and <u>arousal</u> (a stimulated libido and its external signs, such as erections).

#### Q Digging Deeper: A chemical mess

Numerous neurotransmitters and hormones are involved in the brain's complex interplay of excitation and inhibition. There's still a lot we don't know, but with regard to excitation, we can point to the dopaminergic reward system as the main orchestrator of desire, with <u>testosterone</u> and <u>estrogen</u> also playing a role in the disposition toward sexual desire.

Meanwhile, serotonin, <u>prolactin</u>, opioids, and endocannabinoids, which mediate pleasure and satisfaction, are largely inhibitory. This may be why the use of <u>antidepressants</u> that increase serotonin signaling (such as *selective serotonin reuptake inhibitors* <u>SSRIs</u>) and the abuse of <u>alcohol</u> and <u>opioids</u> are associated with reduced libido: pleasure is frequently achieved without sexual activity and downregulates desire, perhaps even separating it from sexual activity.

Finally, different aspects of physical arousal involve different neurotransmitters (notably norepinephrine, acetylcholine, and histamine) and of course the sex hormones (notably testosterone and estrogen, which, as we said, also play a role in the original disposition toward desire).

# Libido

### Libido basics

Your <u>libido</u> is your sex drive—your desire for sex. Having a low libido isn't always a problem. Some people with low libido simply don't care, or they even consider themselves lucky when they see the trouble so many get into because of sex. But for others, a low libido is a cause of low self-esteem or even distress, and in relationships it can lead to friction when one of the partners' libido is much higher than the other's (an overactive libido, by the way, can also be a problem, but not one we'll address in this guide).

When a person with low libido suffers clinically significant distress because of it, the problem is classified as *hypoactive sexual desire disorder* (HSDD).

Low libido is more common than full-blown HSDD. Low libido is found in 37.7% of females, according to the most notable study, while HSDD affects a rather vaguely estimated 7–12% of females. HSDD is more prevalent in the decades after <u>menopause</u> (females aged 45–65) than in seniors (65+), probably because seniors whose libidio is low are less likely to suffer clinically significant distress because of it. [6]

In males, the picture is even less clear: while reports of low desire are also common, distress and interpersonal difficulties have been insufficiently evaluated, which makes it hard to estimate the prevalence

of HSDD. Estimates of HSDD prevalence in males have varied widely, from under 3% to around 15%. [8] 91

And to muddle the matter even more for both sexes, there's the possibility of underreporting and the possibility of people being negatively affected by their low libido without their distress being high enough for their problem to be classified as HSDD.

### **External factors**

HSDD can be caused by a combination of physiological, psychological, and social factors. For good and for bad, the various aspects of life and health constantly affect one another.

Some 34-40% of females with depression also have HSDD. [10][11] Is HSDD leading to depression or depression to HSDD? Both can probably happen. We know, however, that relationship difficulties aren't the primary cause of HSDD, since only a minority of patients with both depression and HSDD reported relationship difficulties.

It makes sense that depression would lower sex drive, as it lowers drive in general (depressed people find it hard to get motivated by anything, or sometimes even to want anything). Also, reduced libido is a common adverse effect of antidepressants, [3][5] but we should note here that antidepressants cannot explain all cases of low libido in depressed people.

Likewise, it makes sense that many people with HSDD report simultaneous fatigue, and even fatigue as a reason for it, [12][13][14][15] and that stress and anxiety are also cited as reasons for HSDD. [13][14][16] Relatedly, insomnia is a common feature of depression, is often caused by anxiety, and leads to fatigue.[17]

People with low libido who suffer from depression, fatique, anxiety, insomnia, or stress may want to address those issues as a first step (and maybe the only one necessary) to increase their libido. It is also possible that an increase in libido could lead to an increase in well-being, leading to a decrease in depression, fatigue, anxiety, insomnia, and stress.

You can think of it as a "chicken or egg" situation, but it's more of a vicious or virtuous circle: as we mentioned earlier, the various aspects of life and health are interrelated, so it is possible for depression and HSDD to feed each other; but by the same token, if you manage to alleviate one or the other, or maybe both in different ways, the improvements can feed each other until you end up turning a vicious circle into a virtuous one.

#### Caution: Don't self-diagnose

Diagnosing mental disorders is complicated, so don't self-diagnose. If you suspect you suffer from anxiety, depression, HSDD, or any other mental disorder, get the opinion of a mental-health clinician or your primary care physician.

## Arousal

Aside from low libido, the other major sexual dysfunction consists in problems achieving and maintaining

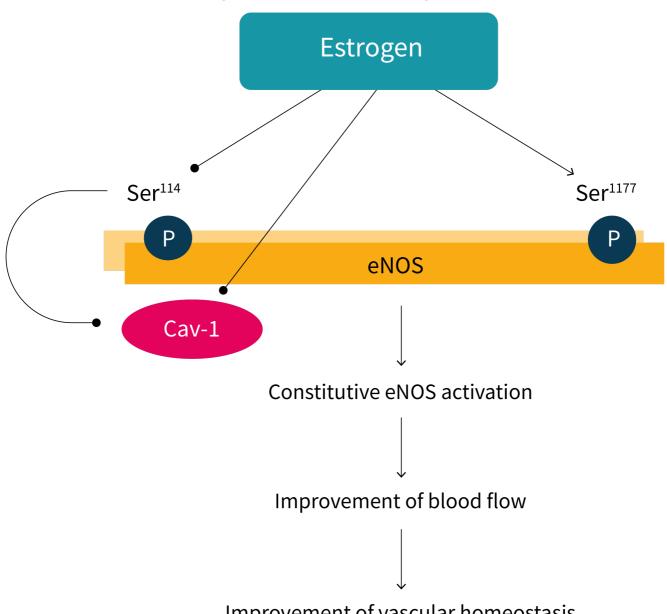
arousal. Arousal refers to libido stimulation as well as to the physiological changes associated with it such as erection, vaginal lubrication, genital sensitivity, and various other phenomena.

For both males and females, blood flow to sexual organs is one of the major features of arousal, and this is mediated through nitric oxide (NO), [18][19] a chemical that signals blood vessels to widen (i.e., dilate). Sildenafil (Viagra) works by increasing NO signaling, [20] though not by affecting nitric oxide synthase (NOS), the enzyme responsible for producing NO.

On the other hand, the effect of nitric oxide synthase (NOS) can be enhanced by compounds present in a wide variety of plants, [21] and your body makes NO from the nitrate in your food or from the amino acid arginine. It follows that some foods and supplements can help with, not just male erections, but also clitoral and vaginal blood flow.[19]

However, since the sex hormones  $\underline{estrogen}$  and  $\underline{testosterone}$  help orchestrate NO production in the genitals, [19][22] if your underlying issue is hormonal, those foods and supplements may not help you. The path to solving your sexual-function issues may start with addressing a root cause a step or two removed from the hormonal deficiency itself, such as obesity and insulin resistance. [23] If you don't know where to start, talk to an endocrinologist.

### Role of estrogen on clitoral and vaginal blood flow



Improvement of vascular homeostasis

It's all quite complicated, and everyone's situation is unique, but we hope that this guide will help you make informed choices and see improvements in your sexual and overall health.

Wyatt Brown, Researcher

## **Combos**

#### Caution: Read this before taking any supplement

Some sexual aids, such as yohimbine and sildenafil (aka Viagra), have stimulatory properties. Taking those with other stimulants (or any other compound liable to increase diastolic blood pressure) can increase the risk of cardiovascular injury.

If you experience an erection that lasts for more than four hours, see your physician immediately to avoid permanent penile damage.

# Core Combo

To keep a healthy libido, you should minimize stress and maintain good habits with regard to sleep, diet, and exercise (intense cardiovascular activity is particularly beneficial). Making positive lifestyle changes should be a priority before supplementation is considered.

There is only one core supplement: maca. Take 2-3 g of maca root powder at breakfast. Pursue this protocol for a month before you consider making any modification.

#### Tip: Try one combo alone for a few weeks

Taking too many supplements at once may prevent you from determining which ones are truly working. Start with just one of the combos suggested here for a couple of weeks before you consider making any modification, such as adding another supplement, altering a supplements dosage, or incorporating the supplements from an additional combo.

When adding another supplement to your regimen, be methodical. For example, you may wish to take all the supplements from two combos. Select the combo that you wish to try first and take this for a couple of weeks. Then, add one supplement from the second combo and wait another week to see how it affects you. Continue this process until you've added all the supplements you wish to.

If a supplement appears in two combos you wish to combine, don't stack the doses; instead, combine the ranges. For instance, if the range is 2-4 mg in one combo and 3-6 mg in the other, your new range becomes 2-6 mg. Always start with the lower end of the range — especially in this case, since the reason why one of the ranges has a lower ceiling in one combo may be due to a synergy with another supplement in the same combo. Reading through the full supplement entry may help you decide which dose to aim for, but if you're not sure, lower is usually safer.

# **Specialized Combos**

### For males and females who want to increase

### their libido

Take the core <u>maca</u> (2–3 g) at breakfast. If after a month your problem is not solved, add either <u>fenugreek</u> (in the form of an extract standardized for 300 mg of saponins), <u>Eurycoma longifolia</u> (200–300 mg of a 100:1 extract), or <u>Tribulus terrestris</u> (200–450 mg of an extract standardized for 60% steroidal saponins); you should not cumulate those three libido boosters, but you can rotate them once a month.

# For males without erectile dysfunction who want to improve their erectile rigidity

Take the core <u>maca</u> (2–3 g) at breakfast. If after a month your problem is not solved, take 5,000 mg of <u>L-arginine</u>, with or without food. L-arginine can be combined with <u>yohimbine</u> (0.2 mg per kilogram of bodyweight, so about 0.09 mg/lb) about 30 minutes before sexual activity.

# For males with untreated erectile dysfunction caused by impaired blood flow

Take the core <u>maca</u> (2–3 g) at breakfast. If after a month your problem is not solved, add 5,000 mg per day of <u>L-arginine</u> and 1 g per day of <u>cocoa polyphenols</u>.

Should the cocoa polyphenols fail to help you after a month, you could try replacing them by <u>Pycnogenol</u> (100–200 mg). Should the Pycnogenol fail to help you after a month, you could try replacing it by a <u>grape seed extract</u> (200–400 mg). Take your Pycnogenol or grape seed extract once a day with food.

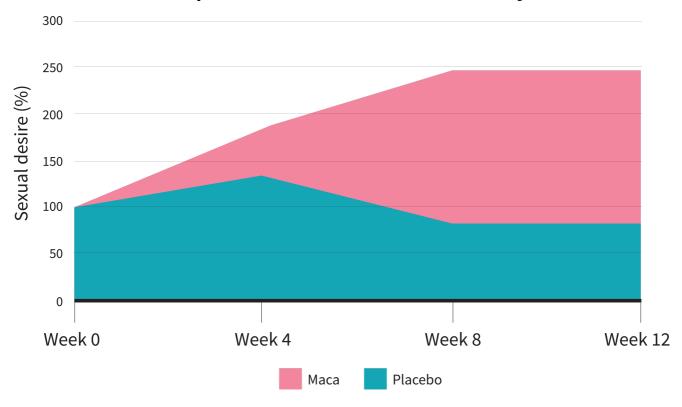
# **Primary Supplements**

### Maca

# What makes maca a core supplement

The majority of studies show that <u>maca</u>, a root vegetable, enhances <u>libido</u> in male and female adults. [24][25][26][27][28][29] Libido may keep improving for up to 8 weeks before plateauing. It should be noted that maca has shown promise for postmenopausal females, [27] an oft-overlooked population when it comes to libido enhancement.

#### Maca vs. placebo on sexual desire in healthy men



Reference: Gonzales et al. Andrologia. 2002. [24]

Maca may serve to treat <u>sexual dysfunction</u> caused by <u>selective serotonin reuptake inhibitors</u> (<u>SSRIs</u>) and <u>serotonin-norepinephrine reuptake inhibitors</u> (<u>SNRIs</u>), [26][27] types of <u>antidepressants</u>. It can also mildly benefit males with <u>erectile dysfunction</u> from other causes.

Maca is not known to interact with any major hormones (such as <u>DHEA</u>, <u>estrogen</u>, or <u>testosterone</u>) or any pharmaceuticals. To date, however, research into maca's potential adverse effects is somewhat limited.

### How to take maca

Take 2-3 grams of maca root powder at breakfast.

For the purpose of improving libido, there does not appear to be a notable difference between red, black, and yellow maca. However, red and black maca are the more well-studied forms.

#### Tip: Why don't you recommend brands or specific products?

#### For two reasons:

- We don't test physical products. What our researchers do all day, every day is analyze peer-reviewed studies on supplements and nutrition.
- We go to great lengths to protect our integrity. As you've probably noticed, we don't sell
  supplements, or even show ads from supplement companies, even though either option
  would generate a lot more money than our Supplement Guides ever will and for a lot less
  work, too.

If we recommended any brands or specific products, our integrity would be called into question, so ... we can't do it. That being said, in the interest of keeping you safe, we drew <u>a short list of steps</u> <u>you should take</u> if a product has caught your interest.

# **Secondary Supplements**

# **Arginine**

# What makes arginine a primary option

*Nitric oxide* (NO) is composed of *nitrogen* (N) and *oxygen* (O). Your body creates NO out of the arginine and <u>nitrate</u> in your food. NO plays a major signaling role in vascular relaxation, and elevated levels are associated with better blood flow.

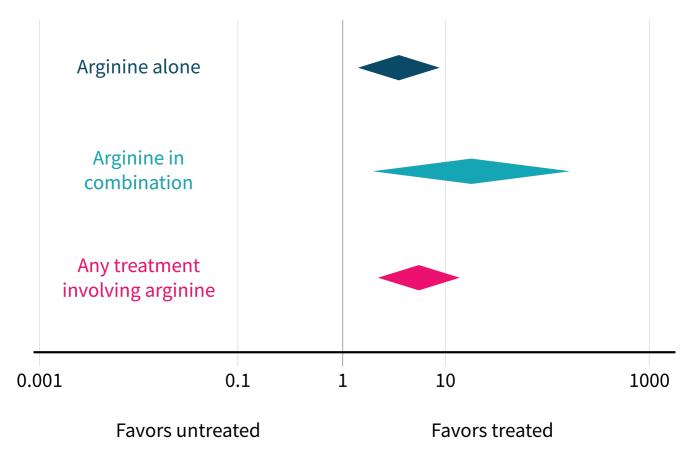
Several *randomized controlled trials* (RCTs) have tested oral arginine for mild to moderate *erectile dysfunction* (ED), but usually in combination with other supplements. Of the 10 RCTs (540 participants) included in a 2019 meta-analysis, [30]

- 3 RCTs used arginine alone.
- 2 RCTs used arginine with pycnogenol.
- 2 RCTs used arginine with vohimbe.
- 1 RCT used arginine with adenosine monophosphate (AMP).
- 1 RCT used arginine with citrulline.
- 1 RCT used arginine with ornithine.

Compared to placebo or no treatment, arginine was found to improve ED, overall satisfaction, intercourse satisfaction, and orgasmic function, but not sexual desire. These benefits were increased when arginine was combined with other supplements.

#### Odds of ED improvement with arginine

**Odds Ratio** 



Reference: Rhim et al. J Sex Med. 2019[30]

# Warnings about arginine

In the 10 RCTs included in the aforementioned 2019 meta-analysis, the overall rate of adverse effects was 8.3% in the arginine groups and 2.4% in the placebo groups. In the 3 RCTs on arginine alone, the overall rate of adverse effects (<a href="headaches">headaches</a>, <a href="insomnia">insomnia</a>, and itching) was 2% in the arginine groups and 0% in the placebo groups.

Talk to a medical professional before you decide to supplement with arginine, especially if you had a heart attack, if you have asthma or allergies, or if you take anticoagulants, antiplatelets, diabetes medication, or hypertension medication. [31]

#### Q Digging Deeper: Study discrepancies

Arginine is known as a "NO booster" — a supplement that boosts NO levels. Yet studies on exercise performance found that supplementing with arginine had little effect on arginine levels in the blood. In our *Muscle Gain & Exercise Performance* guide, we even <u>say</u> that "absorption of arginine by the intestines is limited, and much is eliminated from the body before it can reach the muscles".

But then, why does it work for ED?

We don't know. It may be that people with ED have suboptimal NO levels, and that their bodies are more likely to seize on any extra arginine to make more NO. It may be that, if people with ED really have suboptimal NO levels, even a little increase in NO can have a notable effect. It is possible ... to keep guessing, but until studies bring some light on this topic, any guess is just that: a guess.

# How to take arginine

Take 5,000 mg per day of L-arginine, with or without food.

If you experience headache or itching, take two 2,500 milligram doses separated by at least a few hours (4 or more). Consuming the single or split doses with food may also alleviate these adverse effects.

If you experience insomnia, take arginine in the morning.

#### Q Digging Deeper: Arginine vs. Viagra

L-arginine has similar effects to Viagra (<u>sildenafil</u>) — a <u>PDE-5 inhibitor</u> — that are lower in magnitude when compared using scores taken from the International Index of Erectile Function (<u>IIEF</u>) scale. [32]

For example, the meta-analysis discussed above found that L-arginine increased overall erectile function scores by 2.36 points for arginine alone and 5.11 points for arginine in combination with other supplements. By comparison, a meta-analysis of 4,836 males with ED saw a 9.65 point improvement in those taking Viagra. Other PDE-5 inhibitors, such as <u>tadalafil</u> (Cialis, Adcirca) and <u>vardenafil</u> (Levitra, Staxyn), saw a 8.52 and 7.50 point improvement, respectively.

Viagra does seem to have a higher rate of adverse effects, with one meta-analysis of 14 trials reporting rates of flushing (12%), headache (11%), indigestion (i.e., dyspepsia) (5%), and visual disturbances (3%).[34]

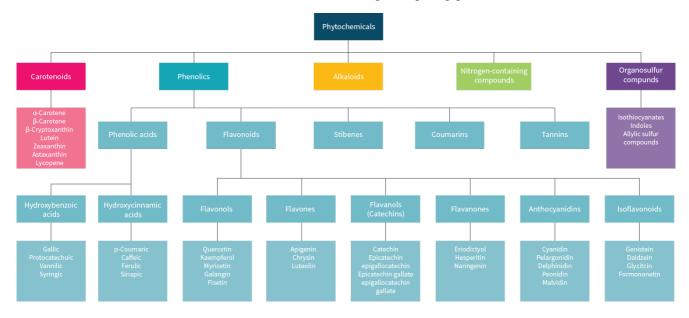
## Cocoa

# What makes cocoa a primary option

Low <u>nitric oxide</u> (NO) levels can cause blood vessels to narrow, leading to poor circulation, which can result in erections that are softer and more difficult to maintain. Like the flavonoids in <u>grape seed</u> and <u>pine bark</u>, (-)-epicatechin and other flavonoids in cocoa can help support NO levels, thus improving <u>blood flow</u> and alleviating this cause of <u>erectile dysfunction</u>.

Judging from a study on a grape seed extract, the improvement in blood flow from cocoa might be negated by the flavonoid <u>quercetin</u>, whose concurrent supplementation should therefore be avoided.

#### Classification hierarchy of polyphenols



### How to take cocoa

Take 1 g of *cocoa polyphenols*, for instance by consuming about 30 g of cocoa powder or 40 g of dark chocolate with a 75% cocoa content. Neither milk chocolate nor white chocolate is a good source of polyphenols.

## **Yohimbine**

## What makes yohimbine a primary option

Yohimb*ine* is an alkaloid found in the bark of the African tree yohimb*e* (*Pausinystalia johimbe*). It is a stimulant often used as a fat burner. It is also supplemented by males wishing to increase virility and erectile rigidity.

Yohimbine can have a variety of adverse effects, such as elevated <u>heart rate</u> and <u>anxiety</u>. In fact, studies on anxiety commonly use yohimbine to *induce* anxiety. In people with panic disorders, it can even induce panic attacks. *Anyone susceptible to anxiety should steer clear of yohimbine.* 

Yohimbine should not be used alongside <u>antipsychotics</u>. It should not be used alongside <u>antidepressants</u>, such as monoamine oxidase inhibitors (<u>MAOIs</u>) or tricyclic antidepressants (<u>TCAs</u>). It should not be used by people who treat their <u>migraines</u> with <u>ergotamine</u>.

Yohimbine must be used carefully, especially when combined with other stimulants, such as <u>caffeine</u> or <u>synephrine</u>. People unaccustomed to stimulants should avoid yohimbine.

Yohimbine is not a reliable treatment for chronic <u>erectile dysfunction</u>, so it should only be used by otherwise healthy males looking for a sexual boost. Although sometimes called "herbal Viagra", it is less effective than <u>sildenafil</u> (Viagra, Revatio) or <u>tadalafil</u> (Cialis, Adcirca). These two pro-erectile drugs are also safer, so they can be used *instead of* yohimbine.

Although sildenafil and tadalafil make for better erections, they have no direct effect on <u>libido</u> (sex drive). Yohimbine *might* have a direct, positive effect on libido, but more research is needed to confirm this benefit, which at best appears unreliable.

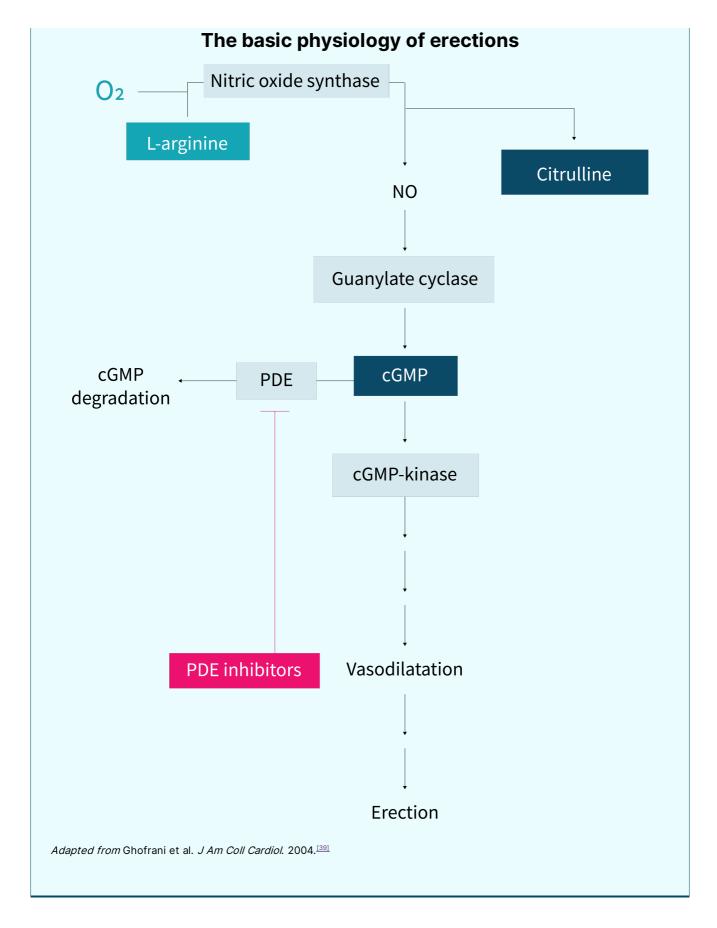
#### Q Digging Deeper: Erections 101

The main mechanism responsible for an erection is an increase in arterial blood flow to the penis through relaxation of the arterial and smooth muscle in the corpus cavernosum, which is spongy tissue running down the length of the penis. When the smooth muscle relaxes, blood flow increases into the corpus cavernosum, causing an erection.

Disruption in this process is the primary cause of ED. Therapeutic agents for ED are aimed at restoring normal vascular function, specifically <u>vasodilation</u>, the widening of blood vessels via relaxation of smooth muscle cells in the vasculature.

Nitric oxide (NO) is the molecule that is responsible for vasodilation in the penis and is the primary target of many pharmaceutical agents. NO works by causing cyclic guanosine monophosphate (cGMP) release inside cells, which signals for smooth muscle relaxation and vasodilation, allowing more blood to flow into the penis, thereby causing erections. [36]

<u>Erections</u> are sustained until cGMP is broken down by another molecule, phosphodiesterase (PDE). PDE-5 inhibitors, like <u>sildenafil</u> (Viagra, Revatio), are the main pharmaceutical agent used to treat ED. However, headaches, indigestion, abdominal pain, and flushing are common adverse effects of PDE-5 inhibitors. Furthermore, these drugs don't work in some people. These issues mean that there's room for other possible therapies to improve ED.



# How to take yohimbine

To supplement yohimbine by itself, without other stimulants, take 0.2 mg of yohimbine per kilogram of bodyweight (0.09 mg/lb). The table below provides the proper dose by bodyweight.

If you take other stimulants, reduce the yohimbine dose by half. Despite being a stimulant, yohimbine does not seem to impair sleep, but should your body tell you otherwise, pay heed and avoid supplementation too

close to bedtime.

#### Yohimbine intake

WEIGHT (kg/lb)	FULL DOSE (mg)	HALF DOSE (mg)	
45 / 100	9	4.5	
57 / 125	11	5.5	
68 / 150	14	7	
79 / 175	16	8	
91 / 200	18	9	
102 / 225	20	10	
113 / 250	23	11.5	
125 / 275	25	12.5	

Yohimb*ine* has fewer side-effects than yohimb*e* (bark powder). For that reason, and because the yohimbine content of yohimbe can vary greatly, supplementing yohimbine is considered safer than supplementing yohimbe. However, companies selling "yohimbine" often use a bark extract whose yohimbine content has been estimated rather than assessed via testing, so the actual yohimbine content of a product can differ dangerously from the number on the label. Should you decide to supplement yohimbine, start with the lowest possible dose (often, 2.5 mg), then slowly work your way up.

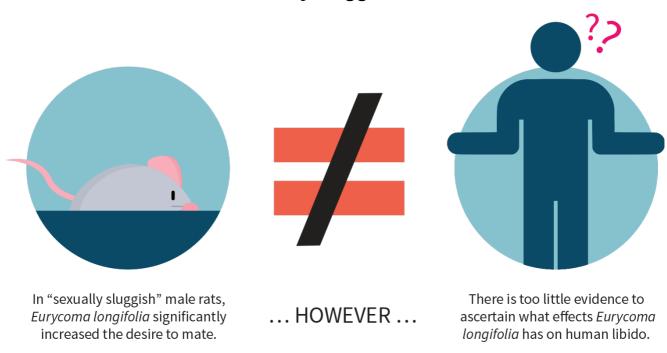
# **Promising Supplements**

# Eurycoma Longifolia Jack

# What makes *Eurycoma longifolia* a secondary option

*Eurycoma longifolia* is also known by several other names, such as longjack and tongkat ali. Preliminary evidence supports its traditional use as a <u>libido</u> enhancer for both males and females, but more research is needed to make it more than a secondary option.

#### The sexually sluggish male rat



References: Zanoli et al. J Ethnopharmacol. 2009. [40] ● Ismali et al. Evid Based Complement Alternat Med. 2012. [41]

Preliminary evidence also supports the use of *Eurycoma longifolia* as a male fertility enhancer. This herb does not seem to increase <u>testosterone</u>, however, or only to a small extent in males suffering from <u>infertility</u> or severe <u>erectile dysfunction</u>. If it does increase testosterone in infertile men, its antioxidant content may be responsible, since <u>vitamin E</u> and <u>coenzyme Q10</u> have the same effect.

# How to take Eurycoma longifolia

To supplement *Eurycoma longifolia*, take 200–300 mg of a 100:1 extract (concentrated for eurycomanone) daily, preferably in two separate doses.

# **Fenugreek**

# What makes fenugreek a secondary option

In Ayurvedic medicine, fenugreek is called *methi* (its Hindi name) and it's used notably to increase virility. While the leaves and seeds are both used, most supplements favor the seeds.

When supplemented by healthy males, high doses of fenugreek appear to significantly increase <u>libido</u> and sexual satisfaction. A small increase in <u>testosterone</u> was noted in some studies, but not in others. When dihydrotestosterone (<u>DHT</u>) was assessed, no significant change was reported.

### Graphic summary of trials on fenugreek and testosterone

RESULT	DOSE	DOSE DURATION		
Testosterone				
No change in testosterone.	Testofen (patented fenugreek extract): 600 mg/day	6 weeks	60 healthy males	
Testosterone DHT			* * * * * * * * * * * * * * * * * * * *	
Increase in testosterone, but no change in DHT. Decrease in body fat, but no change in lean mass.	Fenugreek: 500 mg/day	8 weeks	30 resistance-trained males	
Testosterone DHT				
No change in testosterone or DHT.	Fenugreek extract: 500 mg/day	8 weeks	49 resistance-trained males	
Testosterone DHT				
Decrease in DHT, but no change in testosterone.	Fenugreek extract: 500 mg/day	8 weeks	45 resistance-trained males	

References: Steels et al. Phytother Res. 2011.  $\bullet$  Wilborn et al. Int J Sport Nutr Exerc Metab. 2010.  $\bullet$  Poole et al. J Int Soc Sports Nutr. 2010.  $\bullet$  Wilborn et al. MSSE. 2009. DOI:  $\bullet$  10.1249/01.MSS.0000355250.80465.30

Fenugreek has the interesting property of causing bodily fluids (saliva, semen, sweat, urine ...) to smell like maple syrup. More importantly, fenugreek contains <u>coumarin</u>, a blood-thinning compound that could

interact with blood-thinning medication, such as <u>warfarin</u> (Coumadin, Jantoven) and <u>acenocoumarol</u> (Sintrom).

# How to take fenugreek

Take a fenugreek supplement standardized for 300 mg of saponins. If you purchase a product with Testofen®, aim for 600 mg of this proprietary extract.

# **Procyanidins**

# What makes procyanidins a secondary option

Low <u>nitric oxide</u> (NO) levels can cause blood vessels to narrow, leading to poor circulation, which can result in erections that are softer and more difficult to maintain. Like the flavonoids in <u>cocoa</u>, procyanidins and other flavonoids in <u>pine bark</u> and <u>grape seeds</u> can help support NO levels, thus improving <u>blood flow</u> and alleviating this type of <u>erectile dysfunction</u>.

Pycnogenol®, a patented pine bark extract standardized to 65–75% procyanidin, is the best-studied source of procyanidins. Grape seed extracts are cheaper, but their benefits to blood flow are less reliable and could take longer to develop (up to one month). To improve blood flow, Pycnogenol is a better choice than a grape seed extract, but neither option is as potent as cocoa or can boast as much supporting evidence.

The flavonoid <u>quercetin</u> may negate the improvement in blood flow from grape seed extracts (and, by extension, from pine bark extracts). Concurrent supplementation should therefore be avoided.

# How to take procyanidins

To supplement *Pycnogenol*, take 100–200 mg once a day with food.

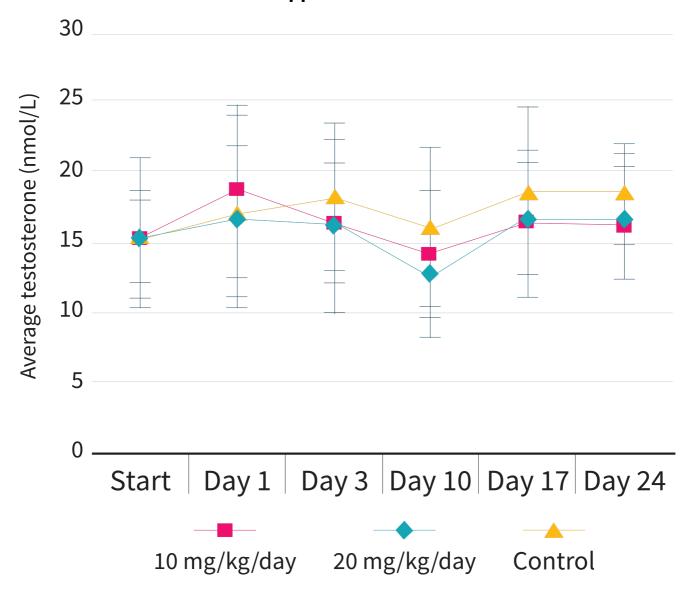
To supplement a grape seed extract, take 200-400 mg once a day with food.

# **Tribulus Terrestris**

# What makes *Tribulus terrestris* a secondary option

*Tribulus terrestris* is an herb that has been used in Iranian, Persian, Turkish, Sudanese, Indian Ayurveda, and <u>Traditional Chinese Medicine</u> to treat an assortment of diseases. *Tribulus terrestris* has long been marketed as an herbal <u>testosterone booster</u>, with no supporting evidence. This herb may enhance <u>libido</u>, though, which convinces many males that their <u>testosterone</u> has increased.

# No difference in testosterone with \_Tribulus terrestris\_ supplementation



Reference: Neychev and Mitev. J Ethnopharmacol. 2005. [45]

Little research has been conducted on the effects of herbs on libido, which is why even the most promising among them can only be secondary options.

### How to take Tribulus terrestris

To supplement *Tribulus terrestris*, take 200–450 mg of an extract standardized for 60% steroidal saponins once a day with food.

# **Unproven Supplements**

Of the supplements we have reviewed, none currently fit the above description.

Keep in mind that all libido boosters are overhyped to some extent. Sexual enhancement is a lucrative market, so unsubstantiated claims are numerous. As a rule, avoid "proprietary blends" that can hide from you how much of each ingredient you are actually getting.

# **Inadvisable Supplements**

# <u>Libido Enhancers</u> and <u>Testosterone</u> Boosters

# What makes *libido enhancers* and *testosterone* boosters inadvisable supplements

The sexual enhancement and muscle building categories make up much of the supplement market. Not surprisingly, these two categories are most likely to be tainted with unauthorized drugs (intentionally, in some cases). Particular caution and skepticism should be given to any supplement sporting these marketing claims.

There is precious little human evidence to support the efficacy of testosterone boosters. Studies are seldom replicated, and when replicated seldom draw the same conclusions. Furthermore, even if a supplement can coax your body into producing more <u>testosterone</u>, it can only do so within your physiological limits — do not expect steroid-like effects.

Some supplements claiming to boost testosterone — including <u>maca</u>, <u>fenugreek</u>, and <u>Tribulus terrestris</u> — actually enhance <u>libido</u>. People often assume that an increase in libido reflects an increase in testosterone or vice versa. This is not always true. An increase in <u>libido</u> can be achieved even with no change in testosterone while an increase in testosterone doesn't necessarily translate into an increased libido (although it can, in some cases).

# **Nicotine**

# What makes *nicotine* an inadvisable supplement

Nicotine — and cigarette smoking in particular — can reduce arousal in both males and females [46][47][48][49]

For males specifically, regular cigarette consumption is a risk factor for <u>erectile dysfunction[50]</u> and may reduce fertility.[51]

# **FAQ**

# Q. What about the supplements not covered in this guide?

Our guides are regularly updated, often with new supplements. We prioritize assessing (and reassessing) the most popular of them and those most likely to work. However, if there is a specific supplement you'd like to see covered in a future update, please let us know by <u>filling out this survey</u>.

# Q. Can I add a supplement not covered in this guide to my combo?

Supplement with your current combo for a few weeks before attempting any change. Talk to your physician and <u>research each potential addition</u>. Check for known negative interactions with other supplements and pharmaceuticals in your current combo, but also for synergies. If two supplements are synergistic or additive in their effects, you might want to use lower doses of each.

# Q. Can I modify the recommended doses?

If a supplement has a recommended dose range, stay within that range. If a supplement has a precise recommended dose, stay within 10% of that dose. Taking more than recommended could be counterproductive or even dangerous. Taking less could render the supplement ineffective, yet starting with half the regular dose could be prudent — especially if you know you tend to react strongly to supplements or pharmaceuticals.

# Q. At what time should I take my supplements?

The answer is provided in the "How to take" section of a supplement entry whenever the evidence permits. Too often, however, the evidence is either mixed or absent. Starting with half the regular dose can help minimize the harm a supplement may cause when taken during the day (e.g., <u>fatigue</u>) or in the evening (e.g., <u>insomnia</u>).

# Q. Should I take my supplements with or without food?

The answer is provided in the "How to take" section of a supplement entry whenever the evidence permits. Too often, however, the evidence is either mixed or absent. Besides, a supplement's digestion, absorption, and metabolism can be affected differently by different foods. Fat-soluble vitamins ( $\underline{A}$ ,  $\underline{D}$ ,  $\underline{E}$ ,  $\underline{K}$ ), for instance, are better absorbed with a small meal containing fat than with a large meal containing little to no fat.

### Q. What are DRI, RDA, AI, and UL?

The <u>Dietary Reference Intakes</u> (DRIs) is a system of nutrition recommendations designed by the Institute of Medicine (a US institution now known as the <u>Health and Medicine Division</u>). RDA, AI, and UL are part of this system.

- Contrary to what the name suggests, a Recommended Dietary Allowance (RDA) doesn't represent
  an ideal amount; it represents the minimum you need in order to avoid deficiency-related health
  issues. More precisely, it represents an amount just large enough to meet the minimum requirements
  of 97.5% of healthy males and females over all ages which implies that the RDA is too low for
  2.5% of healthy people.
- The Adequate Intake (AI) is like the RDA, except that the number is more uncertain.
- The *Tolerable Upper Intake Level* (UL) is the maximum safe amount. More precisely, it is the maximum daily amount deemed to be safe for 97.5% of healthy males and females over all ages which implies that the UL is too high for 2.5% of healthy people.

As a general rule, a healthy diet should include at least the RDA of each nutrient — but less than this nutrient's UL. This rule has many exceptions, though. For instance, people who sweat more need more salt (i.e., sodium), whereas people who take <u>metformin</u> (a diabetes medicine) need more <u>vitamin B12</u>.

Moreover, the DRIs are based on the median weight of <u>adults</u> and <u>children</u> in the United States. Everything else being equal (notably age, sex, and percentage of body fat), you likely need a lesser amount of nutrients if you weigh less, and vice versa if you weigh more. The numbers, however, are not proportional — if only because the brains of two people of very different weights have very similar needs. So you can't just double your RDIs for each nutrient if you weigh twice as much as the median adult of your age and sex (even if we overlook that people weighing the same can differ in many respects, notably body fat).

# Q. I'm a female and wish to increase my libido. How does this influence the above recommendations?

Human studies on <u>libido</u> and sexual satisfaction are mostly conducted on males, though maca has been noted to also work on females. A lot more research is needed to determine how the other herbs mentioned in this guide affect females.

If you try a libido booster, keep a journal of the effects you experience. Taking notes will help you determine which supplements are effective and which are not.

# Q. Isn't soy protein bad for males?

Phytoestrogens are plant compounds structurally similar to estradiol, the main <u>estrogen</u> in males and premenopausal females. Because soy contains <u>isoflavones</u>, a type of phytoestrogen, concern has been raised about soy affecting male health.

To this day, two case reports have documented adverse effects (gynecomastia, hypogonadism, reduced libido, and erectile dysfunction) from an estimated 360 mg of soy isoflavones per day for 6–12 months.

However, a meta-analysis of 15 *randomized controlled trials* (RCTs, a much higher level of evidence than case reports) found that males' levels of <u>total and free testosterone</u> were not notably affected by either 60–240 mg of isoflavones or 10–70 grams of soy protein per day.

Accordingly, a couple of scoops of soy protein powder are unlikely to have estrogenic effects in males. If you'd like to take more, however, look for a soy protein concentrate or isolate produced through the alcohol-wash method, which dramatically lowers the isoflavone content.

Keep in mind that the isoflavone content of different soy products can vary depending on several factors, such as the variety of soybeans used, differences in growing and storage conditions, and differential food processing techniques employed. [53] You can see how it varies below.

#### Isoflavone content of common soy foods

Food category	Food	Milligrams of isoflavones per 100 g of food		
		Average	Minimum	Maximum
Traditional unfermented soy foods	Edamame	18	14	19
	Soybeans (boiled)	65	23	128
	Soybeans (raw)	155	10	440
	Soybean sprouts	34	0	107
	Soy milk (unsweetened)	11	1	31
	Soy nuts	148	2	202
	Tofu	30	3	142
	Miso	41	3	100
	Miso soup	1.5	1.5	1.5
_	Miso soup mix (powder)	70	54	126
Traditional fermented soy foods	Natto	82	46	124
	Soy sauce	1	0	3
	Tempeh	61	7	179
Second-generation soy foods	Soy-based veggie "meats"	9	0	23
	Soy cheeses	26	3	59
	Soy yogurt	33	10	70
Soy flours and protein powders	Soy flour (defatted)	151	74	324
	Soy flour (full-fat)	165	130	260
	Soy infant formula (powder)	28	21	31
	Soy protein concentrate (alcohol wash)	12	2	32
	Soy protein concentrate (water wash)	95	61	167
	Soy protein isolate	91	46	200

# Q. Can alcohol influence my libido?

Yes. A little <u>alcohol</u> might decrease your inhibitions and thus increase your <u>libido</u>, but too much alcohol acutely (drunkenness) or chronically (<u>alcoholism</u>) will lead to sexual disorders: loss of <u>libido</u> and less intense orgasms in both males and females, plus some degree of <u>erectile dysfunction</u> and a probable reduction in <u>testosterone</u> production in males.

# Q. Can my diet influence my libido?

Yes, and in too many ways to count! To tackle the big issues, though, you should keep in mind that diets very low in calories or fat are likely to lessen your <u>libido</u> over time.

# Q. What causes erectile dysfunction

<u>Erectile dysfunction</u> (ED) affects 18% of all men over the age of 20 in the United States, with roughly 45% of men over 20 and roughly 50% of all men aged 40–70 reporting at least some issues with erectile function.<sup>[54]</sup> While increasing age is the biggest risk factor for ED, there are a host of other contributing factors, such as diabetes, vascular disease, low testosterone, and hypothyroidism. [56]

# Q. Will ejaculation decrease my testosterone levels?

Ejaculation results in changes in <u>prolactin</u> (increase) and <u>dopamine</u> (temporary decrease) but <u>does not</u> result in changes in <u>testosterone</u>. Although prolactin and dopamine are both involved with testosterone, they do not appear to influence testosterone levels acutely.

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