AstroFlav A-Pump: Nitric Oxide Pills Unlike Anything You've Seen

written by Mike Roberto | February 3, 2023

AstroFlav is an industry leader in many ways – they're famous for their *astronomically good flavors*, which absolutely do live up to the company's name.

AstroFlav A-Pump is a nitric oxide capsule supplement with the most unique ingredient profile we've seen. An ultimate complementary pre-workout stacker!

Today we're writing about the upgraded **A-Pump**, which is a *capsule-based* supplement, so no delicious AstroFlavors to talk about today – but AstroFlav is definitely on top of their capsule formulation game (as we've seen lately with the *MetaBurn AM* and *MetaBurn PM* fat-burning duo), so this will still be a good one.

A-Pump Upgraded: A capsule pump product unlike anything you've seen

A-Pump is a very unique stimulant-free pre-workout capsule product. The main thrust of the formula is to increase nitric oxide (NO) production, but we have tons of other stuff in here too – fat burners, anti-inflammatories, antioxidants, and even a nice little *nootropic* boost from the ginseng. A do-it-all stim-free supplement to take with your MetaBurn or superpower your *One Scoop Only* pre-workout with.

What's really *cool* about this formula is that it's full of novel, less-common ingredients to complement the standard ones that are likely in your stim-based pre-workout. For example, VasoDrive is headlining the supplement facts label as the primary NO booster. We haven't seen this before!

Plus we're seeing *Amentopump* and *NattoKinase* used to improve blood flow – two ingredients we haven't covered in quite some time.

Let's get into it, but first, check PricePlow's AstroFlav deals and sign up for our news alerts, they're on quite a tear with new products:

Below, we introduce the benefits of increasing nitric oxide. If you're already familiar with that, you can skip down to the ***A-Pump Ingredients*** section of this article.

The Basics: Why We Want More Nitric Oxide

> Whenever we cover an NO-boosting supplement like this one, we like to remind our readers *why* we want more nitric oxide in the first place.
>
> The best answer for most consumers, as implied by the name A-Pump, is that NO can give you a great *muscle pump*. For the supplement newbies among us, the *pump* is a highly sought-after state of *muscle swelling*, in which circulation improves through exercise and/or supplementation to the point where muscles get visibly engorged with blood and water.

Nitric oxide supplements like AstroFlav's stimulant-based One Scoop Only bring better blood flow

The pump is not just cosmetic – it's associated with actual health and performance benefits, like improved performance and potentially better gains. And the benefits of NO actually go way beyond the pump!

Bring the *vasodilation*

The way nitric oxide induces a pump is *vasodilation*, the mechanism by which the smooth muscle lining your arteries *relaxes* in response to NO signaling. This relaxation causes an actual *increase in arterial diameter*, which can lower blood pressure and heart rate by decreasing the fluid resistance of your arteries.

Research consistently finds that vasodilatory agents like NO consistently improve athletic performance[1] and can even improve health by reducing risk of high blood pressure, stroke, and heart attack.[2]

The production of NO is *downregulated* in diabetes,[3] which isn't too surprising given the close connection between metabolic and cardiovascular health.

Mitochondrial health benefits

Animal studies show that upregulating NO can actually reverse the mitochondrial damage caused by diabetes. This is because NO turns out to be a key regulator of *mitochondrial biogenesis*, the process by which your body *creates new mitochondria*.[4] This is a pretty big deal, since healthy mitochondria are crucial for pretty much all aspects of health – healthy aging

in particular.[5]

But it can also help ameliorate metabolic dysfunction. Partly because of NO's effect on mitochondria, NO-boosting supplements like arginine have been found to increase insulin sensitivity and improve blood glucose regulation.[6,7]

Adequate NO production and activity is also necessary for good sleep,[8] and *decreasing* NO production has been shown to interfere with sleep quality on a number of levels.[9,10]

All around, it's great to find ways to improve blood flow and nitric oxide levels. Now let's look at how A-Pump can do it, and even further boost the NO from your existing pre-workout.

AstroFlav A-Pump Ingredients

In a single *3 capsule* serving of AstroFlav A-Pump, you get the following:

- **Hydrolyzed Casein Tripeptides (as VasoDrive-AP) – 508 mg**

SUPPLEMENT FACTS

Serving Size: 3 Capsules
Servings Per Container: 20

	Amount Per Serving	%DV
Hydrolyzed Casein Tripeptides (as VasoDrive-AP®)	508mg	†
Korean Red Ginseng (std 70% Ginsenosides)	325mg	†
Amentopump® (Salaginella tamariscina extract)	200mg	†
NattoKinase 4,000 FU	200mg	†
PurpleForce® Purple Tea Extract (Camellia sinensis)(Leaf)	100mg	†
Pine Bark Extract	100mg	†
Banaba Leaf Extract (10% Corosolic Acid)	50mg	†
BioPerine®	10mg	†

*Percent Daily Value are based on a 2,000 calorie diet
**Daily Value not established

Other Ingredients: Vegetable Cellulose (Capsule), Vegetable Magnesium Stearate

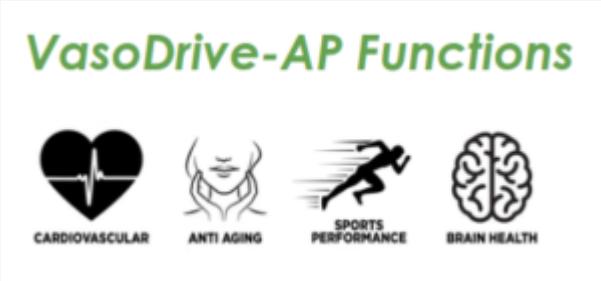
Updated in 2023, the new AstroFlav A-Pump Ingredients bring quite a unique blend that can stack onto nearly any pre-workout, often with *zero* overlap!

VasoDrive-AP consists of two *tripeptide* proteins extracted from the *casein* fraction of milk: *isoleucyl-prolyl-proline (IPP)* and *valyl-prolyl-proline (VPP)*.[11] Milk-derived proteins are called *lacto-tripeptides* (LTPs).

This is an interesting way to kick off a *pump* formula, because VasoDrive increases vasodilation by increasing the expression of *endothelial nitric oxide synthase* (eNOS), the enzyme responsible for producing nitric oxide (NO) in your arteries.[12]

But more interestingly, VasoDrive *inhibits vasoconstriction* – the mechanism by which your arteries *constrict* instead of expanding – which ultimately has the same effects of dilating your blood vessels, improving circulation and helping increase athletic performance.

The proteins in VasoDrive do this by downregulating an enzyme called *angiotensin-converting enzyme* (ACE).[11] As you probably already know (especially if you're over a certain age), ACE inhibition is the same mechanism of action behind many widely-prescribed blood pressure medications.



VasoDrive-AP Functions. Images courtesy MayPro

According to a 2015 meta-analysis of *33 randomized clinical trials*, casein-derived LTPs have effect sizes in the same ballpark as what you could get from time-tested NO-boosting ingredients.

On average, LTPs decreased systolic blood pressure by about 3 mm Hg, and diastolic blood pressure by about 1.5 mm Hg. In some of the trials reviewed by this meta-analysis, researchers saw a reduction of *10 or more mmHg* systolic, and *6 mmHg* diastolic.[11]

Putting those numbers into context, citrulline – an NO booster we all know and love – can reduce systolic blood pressure by about *4 mmHg* on average.[13]

So, are the VasoDrive LTPs in the same league as the NO boosters we usually see? The answer definitely appears to be yes, especially at this dose. Based on existing LTP research and lots of anecdotal feedback from customers, VasoDrive is long overdue for its turn as the flagship ingredient of a pump formula.

And AstroFlav goes big on it, using nearly an entire capsule for it.

- **Korean Red Ginseng (std 70% Ginsenosides) – 325 mg**

  Korean red ginseng (*Panax ginseng*) is a potent *adaptogen*, meaning it can help your body cope with and recover from the demands of intense exercise.

  We normally see ginseng used for *focus*, which is discussed below. But many haven't seen the research on its use for nitric oxide and vasodilation as

well!

- **Ginseng for vasodilation**

Korean Ginseng is also known as *Panax Ginseng*, and has many adaptogenic properties in the body

A 2005 study showed that Korean red ginseng extract was able to increase nitric oxide concentration (as measured in exhaled breath) while lowering heart rate and blood pressure on the *first* use.[14] This was follow-up research from numerous animal trials that demonstrated ginseng's effects on the release of nitric oxide from endothelial cells and perivascular nerves.[15]

Interestingly, there isn't a ton of recent research going in this direction – most ginseng applications are geared towards focus (discussed below) and nutrient transport.

However, there is some animal research showing that ginseng is beneficial for erectile dysfunction, and the researchers attribute that to nitric oxide production.[16]

One mechanism could be due to its effects as an *arginase inhibitor*.[17] This means that it helps downregulate the enzyme that destroys arginine, which is the amino acid that acts as nitric oxide's precursor. All in all, this has led scientists to state that ginseng supports cardiovascular health.[18]

But that may not be the *only* reason it's here:

- **Ginseng as an adaptogenic nootropic**

  Research shows that ginseng supplements can significantly alleviate feelings of fatigue in a broad range of circumstances, and may even improve *depressive* or *anxious* symptoms.[19]

The new AstroFlav A-Pump, launched in early 2023!

One mechanism of action behind its stress-management effects is to limit your body's rate of *apoptosis*,[20] the process of programmed cell death that usually takes place when you are subjected to significant stress.

Ginseng appears to limit apoptosis by decreasing the body's *inflammatory* response to stress, whether that stress be physical or psychological,[19] an effect that is mediated by the *antioxidant phytochemicals* that are abundant in ginseng.[19]

The *brain* is exquisitely sensitive to inflammation and stress, so supplements that control either one of these tend to improve cognition,

and ginseng is no exception. Ginseng has been shown to speed up reactions,[21,22] expand working memory, improve mathematical ability, and increase cognitive flexibility.[23]

Ginseng can also help regulate *glucose metabolism*, helping prevent the swings in blood sugar that are typically caused by stress. This is one way that ginseng can help prevent stress from affecting cognitive performance.[24]

Nootropic ingredients like ginseng are a great thing to use in pre-workout formulas, since *intense workouts* can place demands on mental and physical energy that have the potential to interfere with the accomplishment of daily tasks.

Consider this a two-for-one ingredient, and one that's certainly not dosed this high in your pre-workout supplement. Next is another unique ingredient we haven't seen for a while:

- **Amentopump (Selaginella tamariscina extract) – 200 mg**

  AmentoPump is an extract of *Selaginella tamariscina*, an evergreen perennial that's native to Siberia and southeast Asia. The plant has a long history of traditional use in these regions, where it has been used to treat a wide range of ailments.[25]

Amentoflavone, the primary bioactive constituent of *Selaginella*, has been shown to improve cardiometabolic function in rats eating an obesogenic diet, partly by *inhibiting arterial vasoconstriction*.[26]

Although it's not totally clear *how* amentoflavone causes arterial relaxation, one *in vitro* study found that pre-treatment of aortic tissue with *methylene blue* and ODQ, known inhibitors of *guanylyl cyclase*, abolishes the relaxant effect caused by amentoflavone.[27] More specifically, that study found amentoflavone causes a *doubling* of cyclic guanosine monophosphate (cGMP), the vasodilatory enzyme that's triggered by NO.[27]

This implies that amentoflavone is triggering the NO/cGMP signaling cascade, which in turn implies an increase in NO production or activity. The authors of the study believe that amentoflavone is acting to increase the expression of *endothelial nitric oxide synthase* (eNOS), the enzyme responsible for generating NO within the arteries.

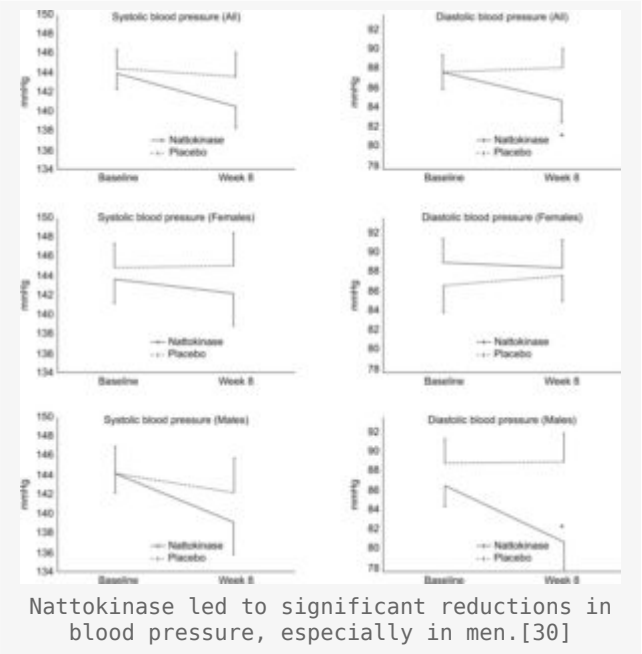
The other possibility is that amentoflavone is somehow *increasing the activity* of existing NO, which would make it an awesome *synergistic* ingredient to throw in this formula with a bunch of NO boosters.

- **NattoKinase 4,000 FU – 200 mg**

  NattoKinase is a *fibrinolytic enzyme* that's become quite popular in alternative medicine circles the past couple of years. As its name implies, it helps break down *fibrin*, an insoluble protein that your body uses to create *blood clots*.[28]

  Together with *neutrophil extracellular traps* (NETs), fibrin forms a composite matrix in your bloodstream that can, under certain circumstances, increase blood viscosity to the point of increasing cardiovascular resistance and blood pressure.[29]

  By targeting the *fibrin* in this scaffold, nattokinase can help break down this clotting tissue, which can lead to a *decrease* in blood viscosity, reductions in blood pressure, and an improvement in cardiovascular function.[30,31]



Nattokinase led to significant reductions in blood pressure, especially in men.[30]

A 2008 *randomized controlled trial* (RCT) found that NattoKinase supplementation can *significantly* reduce the severity of hypertension, and maybe even discourage its onset.[30]

Another from 2016 observed that although NattoKinase can benefit hemodynamics in both sexes, its effect is more pronounced in men.[32] Exogenous testosterone administration is associated with increased risk of *thrombosis*,[33] so it appears that higher average testosterone levels in men are at least one factor in the pronounced male response to NattoKinase supplementation.

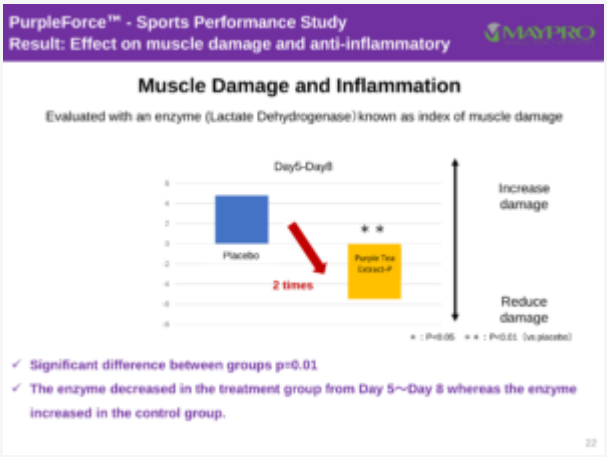
NattoKinase can also help maintain the *long-term health* of your blood vessels – research shows it can help reduce cholesterol and *significantly slow the*

progression of atherosclerosis in people with hyperlipidemia.[34]

Note: Anecdotal evidence suggests that nattokinase can also be an effective treatment for varicose veins. However, at the time of this writing, we are unable to locate peer-reviewed research that has tested this claim.

- **PurpleForce Purple Tea Extract (Camellia sinensis)(Leaf) – 100 mg**

  PurpleForce purple tea extract is a special kind of *tea* – by which we mean *true tea*, the *Camellia sinensis* plant that gives us white, green, oolong, and black tea.



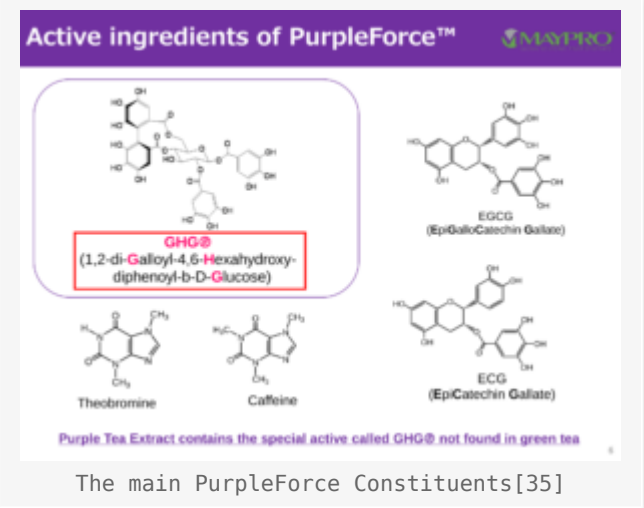
PurpleForce's GHG can reduce muscle damage and inflammation,[35] getting you back into the gym *faster*

The PurpleForce tea has been cross-bred to naturally contain high concentrations of *anthocyanins*, a group of phenolic pigments that are red and blue in color. Anthocyanins are the molecules that give superfoods like pomegranates, beets and blueberries their deep, vivid hues.

Purple Tea and athletic endurance

Given that green and black teas brewed from the leaves of ordinary *Camellia sinensis* have been shown to upregulate NO by decreasing oxidative stress in endothelial tissue,[36] and increased NO is associated with improved physical performance,[37] we would expect to see the same effects with purple tea.

After all, since purple tea is theoretically a *new and improved* variation of the tea plant, we *should* be getting all the usual benefits *plus* some, right? The preliminary research on purple tea seems to indicate that this is the case.



The main PurpleForce Constituents[35]

A 2020 *randomized, double-blind, placebo-controlled* study found that PurpleForce had better athletic endurance during exercise, and significantly lower *lactate dehydrogenase* levels post-workout.[38]

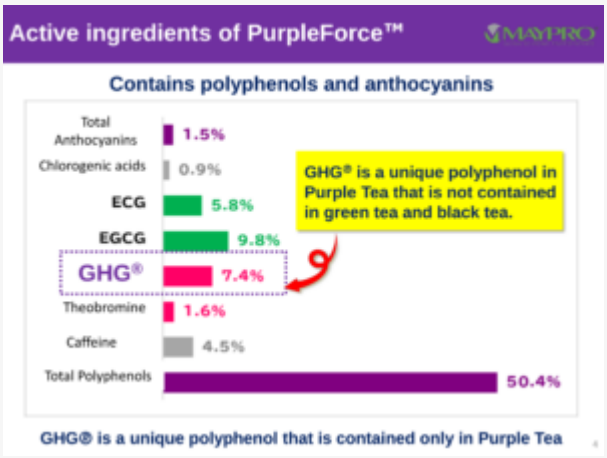
Since your body makes lactate dehydrogenase in response to rising lactic acid levels, lower levels of lactate dehydrogenase imply less buildup of lactic acid in muscle tissue. The reason this matters is that lactic acid accumulation during exercise is a major contributor to *muscular fatigue*, so *decreasing* lactic acid can *increase athletic endurance*.

PurpleForce-treated subjects in the same study also had *more motivation to exercise*,[38] which is obviously a great thing in the context of a pre-workout formula. Not that you hard-charging AstroFlav One Scoop Only users need any more motivation…

GHG: fat-burning compound in PurpleForce

One of the key *chemical* differences between PurpleForce and generic strains of *Camellia sinensis* is **1,2-di-Galloyl-4,6-Hexahydroxydipheno yl–D-Glucose**, which fortunately can be abbreviated as **GHG**.[39] This seems to be a powerful *anti-obesity* and *anti-aging* compound.[39]

Part of the way GHG works is by *preventing the absorption of dietary fat*. This was demonstrated in a 2015 study that supplemented participants with 100 mg of purple tea extract per day for 30 days. By the end of the experiment, the subjects had significantly reduced levels of *subcutaneous fat* in their abdomens and upper arms.[40]



PurpleForce has many constituents similar to other tea leaves, but it's the *GHG* content we're after[35]

Moreover, the subjects' *lean body mass* – i.e., muscle tissue – increased as well.[40]

In another study where subjects simply drank purple tea on a daily basis, the following effects were observed throughout the study period[35,41]:

- Decrease in *body mass index* (BMI)
- Lower body weight
- Decreased body fat percentage
- Reduced abdominal fat
- Improved *waist to hip* ratio

According to MAYPRO, the distributor of PurpleForce, this ingredient can also upregulate an enzyme called *adenosine monophosphate activated protein kinase* (AMPK), a metabolic master switch that tells your cells to produce energy.[35,42]

Upregulating AMPK is a mechanism that consistently raises metabolic rate – *caffeine* works to increase fat burning the same way.

- **Pine Bark Extract – 100 mg**

  Pine bark extract is another powerful NO booster.

Make sure your metabolism gets an early jumpstart with *MetaBurn AM*.

It's chock full of powerful antioxidant phenols[43,44] that have been shown to increase the expression of eNOS, which as we know by now is a surefire way to boost NO production and increase vasodilation.[43-45]

This is one of those ancient remedies – pine bark extracts have been used all over the world for millennia to treat cardiovascular dysfunction, which has been referred to by various names including "blood stasis" in traditional Chinese medicine (TCM).[43,44]

Scientific research has borne this out, and shows that pine bark has impressive cardioprotective effects.[43,44]

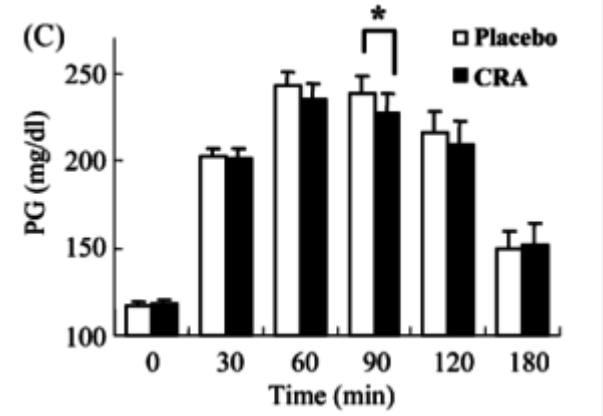
In fact, pine bark is so powerfully anti-inflammatory that it could even decrease a person's chance of developing neurological disease.[44]

- **Banaba Leaf Extract (10% Corosolic Acid) – 50 mg**

  Now it's time to get a little bit of that blood sugar pump – especially for those of you who like carbing up before a workout!

  Banaba is native to southeast Asia, where it's been used for hundreds if not thousands of years in traditional medicine. As far as modern scientific literature is concerned, banaba appears as early as 1940[46] and has been studied for its *anti-diabetic*, *antioxidant*, *anti-obesity*, and *anti-lipidemic properties*.[46]

  Banaba's main constituent is **corosolic acid**, a powerful anti-inflammatory and anti-microbial molecule.[46]



Corosolic Acid from Banaba helps limit a post-glucose-challenge bump[47]

When researchers create diabetes in rats and then have those rats take a corosolic acid supplement, the supplement *significantly* reduces the inflammation and high blood pressure that usually goes along with obesity.[48]

Corosolic acid can decrease *gluconeogenesis*, the process by which your liver converts protein into glucose, which can help keep blood glucose levels under control.

One second-order effect of this is to prevent the buildup of *fatty tissue in your liver*, a process called steatosis.[49] In other words, by *preventing* gluconeogenesis, corosolic acid could potentially decrease of liver disease.[50]

Corosolic acid is the main player here, but it's not the only one – banaba leaf also contains important bioactives like *ellagitannins*, *olenolic acid*, and *valoneic acid*, which do contribute to the overall anti-diabetic and anti-obesity effect of banaba leaf.[46]

Banaba supplementation can increase the uptake of glucose by your cells, which naturally lowers the amount of glucose in your blood, increase insulin sensitivity, and even prevent dietary carbohydrate absorption by interfering with the digestion of *sucrose* (table sugar).[46]

- **BioPerine – 10 mg**

  We're finishing off the A-Pump formula with **BioPerine**, a black pepper extract that's standardized for *piperine*.

Workout time is *carbohydrate* time! Get them in during your workout with AstroFlav Full Tank

BioPerine is a *bioavailability enhancer*, meaning that it can increase your absorption of every other ingredient in this formula. It works by inhibiting certain stomach enzymes that usually break down ingredients in your stomach, before they can be absorbed by your intestines.[51]

Piperine also increases the expression of GLUT4,[52] a transporter protein that shuttles glucose into your muscle cells. This can potentially help aid recovery from exercise, and can definitely help keep blood glucose levels under control.

Piperine has also been shown to improve certain aspects of fatty liver, insulin resistance, and oxidative stress.[53,54]

Dosage and Stacking

As we've alluded throughout the article, A-Pump is *highly* complementary to the

epic *AstroFlav One Scoop Only* pre-workout supplement. However, it's not necessary to stack, you can definitely use it alone to get a *very* unique pump effect.

For maximum results, we'd suggest training with *Full Tank*, an intra-workout supplement that has carbs and essential amino acids. The carbohydrate component should get driven into cells more effectively thanks to the *banaba extract* in A-Pump!

A-Pump: An incredibly unique pump cap

AstroFlav A-Pump is easily one of the most impressive and unique "do it all" stim-free pre-workout capsule formulas we've seen. We're always eager to see the industry explore alternative formulations in the pre-workout category.

The absence of pre-workout staples like citrulline, arginine, and beta-alanine is conspicuous – and welcome. You can get those anywhere. You *can't* get ingredients like AmentoPump and NattoKinase anywhere, though.

Based on research, the effect sizes we can expect from VasoDrive are not *quite* as big as what we'd get from something like 6 grams of citrulline, but remember, this is a capsule product. Given that we have a ton of other NO boosters and enhancers in here – Korean red ginseng, PurpleForce, and pine bark extract being especially potent – we're still confident that the overall NO-boosting effect will be on par with industry-leading pre-workout formulas.

The inclusion of NattoKinase for improved *hemodynamics* is a really interesting choice. And its presence in this formula strengthens the case for taking A-Pump on a *daily basis*, given the long-term cardiovascular benefits of NattoKinase.

In short, we think AstroFlav really knocked it out of the park with this one.

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References

1. *Bescós, Raúl et al. "The effect of nitric-oxide-related supplements on human performance." Sports medicine (Auckland, N.Z.) vol. 42,2 (2012): 99-117. doi:10.2165/11596860-000000000-00000;* *https://link.springer.com/article/10.2165/11596860-000000000-00000*
2. *Naseem, Khalid M. "The role of nitric oxide in cardiovascular diseases." Molecular aspects of medicine vol. 26,1-2 (2005): 33-65. doi:10.1016/j.mam.2004.09.003* *https://linkinghub.elsevier.com/retrieve/pii/S0098-2997(04)00075-5*
3. *Tessari, Paolo et al. "Nitric oxide synthesis is reduced in subjects with type 2 diabetes and nephropathy." Diabetes vol. 59,9 (2010): 2152-9. doi:10.2337/db09-1772* *https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2927936/*
4. *Ramírez-Sánchez I, Rodríguez A, Moreno-Ulloa A, Ceballos G, Villarreal F. (-)-Epicatechin-induced recovery of mitochondria from simulated diabetes: Potential role of endothelial nitric oxide synthase. Diab Vasc Dis Res. 2016 May;13(3):201-10. doi: 10.1177/1479164115620982;* *https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5107246/*
5. *Sun, Nuo et al. "The Mitochondrial Basis of Aging." Molecular cell vol. 61,5 (2016): 654-666. doi:10.1016/j.molcel.2016.01.028;* *https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4779179/*
6. *Piatti, P M et al. "Long-term oral L-arginine administration improves peripheral and hepatic insulin sensitivity in type 2 diabetic patients." Diabetes care vol. 24,5 (2001): 875-80. doi:10.2337/diacare.24.5.875;* *https://diabetesjournals.org/care/article-lookup/doi/10.2337/diacare.24.5.875*
7. *Monti, L D et al. "Effect of a long-term oral l-arginine supplementation on glucose metabolism: a randomized, double-blind, placebo-controlled trial." Diabetes, obesity & metabolism vol. 14,10 (2012): 893-900. doi:10.1111/j.1463-1326.2012.01615.x;* *https://dom-pubs.onlinelibrary.wiley.com/doi/10.1111/j.1463-1326.2012.01615.x*
8. *Bain, Anthony R et al. "Insufficient sleep is associated with impaired nitric oxide-mediated endothelium-dependent vasodilation." Atherosclerosis vol. 265 (2017): 41-46. doi:10.1016/j.atherosclerosis.2017.08.001* *https://linkinghub.elsevier.com/retrieve/pii/S0021-9150(17)31223-6*
9. *Kapás, L et al. "Inhibition of nitric oxide synthesis inhibits rat sleep." Brain research vol. 664,1-2 (1994): 189-96. doi:10.1016/0006-8993(94)91969-0* *https://linkinghub.elsevier.com/retrieve/pii/0006-8993(94)91969-0*
10. *Kapás, L et al. "Inhibition of nitric oxide synthesis suppresses sleep in rabbits." The American journal of physiology vol. 266,1 Pt 2 (1994): R151-7. doi:10.1152/ajpregu.1994.266.1.R151;* *https://journals.physiology.org/doi/abs/10.1152/ajpregu.1994.266.1.R151*
11. *Fekete ÁA, Givens DI, Lovegrove JA; "Casein-Derived Lactotripeptides Reduce Systolic and Diastolic Blood Pressure in a Meta-Analysis of Randomised Clinical Trials."; Nutrients; 2015; 7(1):659-681;* *https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4303860/*
12. *Mas-Capdevila, Anna et al. "Evidence that Nitric Oxide is Involved in the Blood Pressure Lowering Effect of the Peptide AVFQHNCQE in Spontaneously Hypertensive Rats." Nutrients*

vol. 11,2 225. 22 Jan. 2019, doi:10.3390/nu11020225; https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6412221/

13. *Barkhidarian, Bahareh et al. "Effects of L-citrulline supplementation on blood pressure: A systematic review and meta-analysis." Avicenna journal of phytomedicine vol. 9,1 (2019): 10-20.* https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6369322/
14. *Han, Kun, et al. "Korea Red Ginseng Water Extract Increases Nitric Oxide Concentrations in Exhaled Breath." Nitric Oxide, vol. 12, no. 3, May 2005, pp. 159–162, 10.1016/j.niox.2005.02.001;* https://pubmed.ncbi.nlm.nih.gov/15797844/
15. *Murphy, Laura L., and Tony Jer-Fu Lee. "Ginseng, Sex Behavior, and Nitric Oxide." Annals of the New York Academy of Sciences, vol. 962, 1 May 2002, pp. 372–377, 10.1111/j.1749-6632.2002.tb04081.x;* https://pubmed.ncbi.nlm.nih.gov/12076988/
16. *Cho, KS, et al. "Effects of Korean Ginseng Berry Extract (GB0710) on Penile Erection: Evidence from in Vitro and in Vivo Studies." Asian Journal of Andrology, vol. 15, no. 4, 27 May 2013, pp. 503–507, 10.1038/aja.2013.49;* https://pubmed.ncbi.nlm.nih.gov/23708462/
17. *Shin, Woosung, et al. "Korean Red Ginseng Inhibits Arginase and Contributes to Endothelium-Dependent Vasorelaxation through Endothelial Nitric Oxide Synthase Coupling." Journal of Ginseng Research, vol. 37, no. 1, 15 Jan. 2013, pp. 64–73, 10.5142/jgr.2013.37.64;* https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3659627/
18. *Kim, Jong-Hoon. "Cardiovascular Diseases and Panax Ginseng: A Review on Molecular Mechanisms and Medical Applications." Journal of Ginseng Research, vol. 36, no. 1, 11 Jan. 2012, pp. 16–26, 10.5142/jgr.2012.36.1.16;* https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3659571/
19. *Lee S, Rhee DK. Effects of ginseng on stress-related depression, anxiety, and the hypothalamic-pituitary-adrenal axis. J Ginseng Res. 2017 Oct;41(4):589-594. doi: 10.1016/j.jgr.2017.01.010;* https://pubmed.ncbi.nlm.nih.gov/29021708/
20. *Thatte U, Bagadey S, Dahanukar S. Modulation of programmed cell death by medicinal plants. Cell Mol Biol (Noisy-le-grand). 2000 Feb;46(1):199-214;* https://pubmed.ncbi.nlm.nih.gov/10726985/
21. *Reay JL, Scholey AB, Kennedy DO; "Panax ginseng (G115) improves aspects of working memory performance and subjective ratings of calmness in healthy young adults"; Hum Psychopharmacol; 2010;* https://www.ncbi.nlm.nih.gov/pubmed/20737519
22. *Attele AS, et al; "Antidiabetic effects of Panax ginseng berry extract and the identification of an effective component"; Diabetes; 2002;* http://www.ncbi.nlm.nih.gov/pubmed/12031973
23. *Neale C, Camfield D, Reay J, Stough C, Scholey A.; "Cognitive effects of two nutraceuticals Ginseng and Bacopa benchmarked against modafinil: a review and comparison of effect sizes"; Br J Clin Pharmacol. 2013;75(3):728–737. doi:10.1111/bcp.12002;* https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3575939/
24. *Reay JL, Kennedy DO, Scholey AB. Effects of Panax ginseng, consumed with and without glucose, on blood glucose levels and cognitive performance during sustained 'mentally demanding' tasks. J Psychopharmacol. 2006 Nov;20(6):771-81. doi: 10.1177/0269881106061516;* https://pubmed.ncbi.nlm.nih.gov/16401645/
25. *Bailly, Christian. "The traditional and modern uses of Selaginella tamariscina (P.Beauv.) Spring, in medicine and cosmetic: Applications and bioactive ingredients." Journal of ethnopharmacology vol. 280 (2021): 114444. doi:10.1016/j.jep.2021.114444;* https://linkinghub.elsevier.com/retrieve/pii/S0378-8741(21)00673-5
26. *Qin, Li et al. "Amentoflavone improves cardiovascular dysfunction and metabolic abnormalities in high fructose and fat diet-fed rats." Food & function vol. 9,1 (2018): 243-252. doi:10.1039/c7fo01095h;* https://pubs.rsc.org/en/content/articlelanding/2018/FO/C7FO01095H
27. *Kang, Dae Gill et al. "Vasorelaxation by amentoflavone isolated from Selaginella tamariscina." Planta medica vol. 70,8 (2004): 718-22. doi:10.1055/s-2004-827201;* https://www.thieme-connect.com/products/ejournals/abstract/10.1055/s-2004-827201
28. *Weng, Yunqi et al. "Nattokinase: An Oral Antithrombotic Agent for the Prevention of Cardiovascular Disease." International journal of molecular sciences vol. 18,3 523. 28 Feb. 2017, doi:10.3390/ijms18030523;* https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5372539/
29. *Martinod, Kimberly, and Denisa D Wagner. "Thrombosis: tangled up in NETs." Blood vol. 123,18 (2014): 2768-76. doi:10.1182/blood-2013-10-463646;* https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4007606/
30. *Kim, Ji Young et al. "Effects of nattokinase on blood pressure: a randomized, controlled trial." Hypertension research : official journal of the Japanese Society of Hypertension vol. 31,8 (2008): 1583-8. doi:10.1291/hypres.31.1583* https://www.nature.com/articles/hr2008203

31. Pais, Eszter et al. “Effects of nattokinase, a pro-fibrinolytic enzyme, on red blood cell aggregation and whole blood viscosity.” Clinical hemorheology and microcirculation vol. 35,1-2 (2006): 139-42; https://content.iospress.com/articles/clinical-hemorheology-and-microcirculation/ch914
32. Jensen, Gitte S et al. “Consumption of nattokinase is associated with reduced blood pressure and von Willebrand factor, a cardiovascular risk marker: results from a randomized, double-blind, placebo-controlled, multicenter North American clinical trial.” Integrated blood pressure control vol. 9 95-104. 13 Oct. 2016, doi:10.2147/IBPC.S99553 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5066864/
33. Walker, Rob F et al. “Association of Testosterone Therapy With Risk of Venous Thromboembolism Among Men With and Without Hypogonadism.” JAMA internal medicine vol. 180,2 (2020): 190-197. doi:10.1001/jamainternmed.2019.5135 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6865248/
34. Chen, Hongjie et al. “Effective management of atherosclerosis progress and hyperlipidemia with nattokinase: A clinical study with 1,062 participants.” Frontiers in cardiovascular medicine vol. 9 964977. 22 Aug. 2022, doi:10.3389/fcvm.2022.964977 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9441630/
35. MAYPRO; “PurpleForce Purple Tea Extract: New Clinical Data on Beneficial Effect for Exercise”; Retrieved August 31, 2022; https://blog.priceplow.com/wp-content/uploads/maypro-purpleforce-2022.pdf
36. Lorenz M, Urban J, Engelhardt U, Baumann G, Stangl K, Stangl V. Green and black tea are equally potent stimuli of NO production and vasodilation: new insights into tea ingredients involved. Basic Res Cardiol. 2009 Jan;104(1):100-10. doi: 10.1007/s00395-008-0759-3. Epub 2008 Dec 20. PMID: 19101751. https://link.springer.com/article/10.1007/s00395-008-0759-3
37. “Supplement Produces a “Striking” Endurance Boost.” ScienceDaily; August 26, 2010; https://www.sciencedaily.com/releases/2010/08/100826104137.htm
38. Cesareo, Kyle & Ziegenfuss, Tim & Raub, Betsy & Sandrock, Jennifer & Lopez, MD, CSCS, FAAPMR, Hector; “Effects of Purple Tea on Muscle Hyperemia and Oxygenation, Serum Markers of Nitric Oxide Production and Muscle Damage, and Exercise Performance”; September 2020; https://www.researchgate.net/publication/344196837_Effects_of_Purple_Tea_on_Muscle_Hyperemia_and_Oxygenation_Serum_Markers_of_Nitric_Oxide_Production_and_Muscle_Damage_and_Exercise_Performance
39. PURPLE TEA EXTRACT Ver. 1.0 SJ PURPLE TEA EXTRACT Anti-Obesity□Diet Anti-Oxidant□Whitening Anti-Ageing Ingredients FOOD□COSMETICS Ingredient ■ Purple Tea Extract-P (Water Soluble Powder, FOOD Grade); Retrieved August 31, 2022; https://web.archive.org/web/20220831164112/http://www.oryza.co.jp/html/english/pdf/Purple%20Tea%20Extract%201.0SJ.pdf
40. Shimoda, Hiroshi et al; “Purple Tea and Its Extract Suppress Diet-induced Fat Accumulation in Mice and Human Subjects by Inhibiting Fat Absorption and Enhancing Hepatic Carnitine Palmitoyltransferase Expression”; International journal of biomedical science; IJBS vol. 11,2; 2015; pp. 67-75; https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4502735/
41. MAYPRO; “Alluvia Overview”; https://web.archive.org/web/20181024213959/http://maypro.com/sites/default/files/studies/Alluvia_Overview.pdf
42. Kola, B. (2008). Role of AMP-Activated Protein Kinase in the Control of Appetite. Journal of Neuroendocrinology, 20(7), 942–951. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2658714/
43. Iravani, S. et al. June 2011. “Pharmaceutical and Nutraceutical Effects of Pinus Pinaster Bark Extract.” Research in Pharmaceutical Sciences vol. 6,1; 1-11. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3203267/
44. Li, Y. et al. Apr. 2015. “Pine Bark Extracts: Nutraceutical, Pharmacological, and Toxicological Evaluation.” The Journal of Pharmacology and Experimental Therapeutics vol. 353,1; 9–16; https://pubmed.ncbi.nlm.nih.gov/25597308/
45. Fleming I. Molecular mechanisms underlying the activation of eNOS. Pflugers Arch. 2010 May;459(6):793-806. doi: 10.1007/s00424-009-0767-7; https://link.springer.com/article/10.1007/s00424-009-0767-7
46. Miura, Toshihiro et al.; “Management of Diabetes and Its Complications with Banaba (Lagerstroemia speciosa L.) and Corosolic Acid.”; Evidence-based complementary and alternative medicine : eCAM vol. 2012 (2012): 871495. doi:10.1155/2012/871495; https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3468018/
47. Fukushima, M., et al. “Effect of Corosolic Acid on Postchallenge Plasma Glucose Levels.” Diabetes Research and Clinical Practice, vol. 73, no. 2, 1 Aug. 2006, pp. 174–177, 10.1016/j.diabres.2006.01.010; https://pubmed.ncbi.nlm.nih.gov/16549220/
48. Yamaguchi, Yu et al. “Corosolic acid prevents oxidative stress, inflammation and

hypertension in SHR/NDmcr-cp rats, a model of metabolic syndrome.” Life sciences vol. 79,26 (2006): 2474-9. doi:10.1016/j.lfs.2006.08.007 *https://linkinghub.elsevier.com/retrieve/pii/S0024-3205(06)00640-0*

49. *Takagi, Satoshi et al. “Effect of corosolic acid on dietary hypercholesterolemia and hepatic steatosis in KK-Ay diabetic mice.” Biomedical research (Tokyo, Japan) vol. 31,4 (2010): 213-8. doi:10.2220/biomedres.31.213;* *https://www.jstage.jst.go.jp/article/biomedres/31/4/31_4_213/_article*
50. *Sunny, Nishanth E et al. “Excessive hepatic mitochondrial TCA cycle and gluconeogenesis in humans with nonalcoholic fatty liver disease.” Cell metabolism vol. 14,6 (2011): 804-10. doi:10.1016/j.cmet.2011.11.004* *https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3658280/*
51. *Bhardwaj, R. et al. Aug. 2002. “Piperine, A Major Constituent of Black Pepper, Inhibits Human P-glycoprotein and CYP3A4.” The Journal of Pharmacology and Experimental Therapeutics vol. 302, 2. 645-50.* *https://pubmed.ncbi.nlm.nih.gov/12130727/*
52. *Maeda A, Shirao T, Shirasaya D, Yoshioka Y, Yamashita Y, Akagawa M, Ashida H. Piperine Promotes Glucose Uptake through ROS-Dependent Activation of the CAMKK/AMPK Signaling Pathway in Skeletal Muscle. Mol Nutr Food Res. 2018 Jun;62(11):e1800086. doi: 10.1002/mnfr.201800086;* *https://pubmed.ncbi.nlm.nih.gov/29683271/*
53. *Choi S, Choi Y, Choi Y, Kim S, Jang J, Park T. Piperine reverses high fat diet-induced hepatic steatosis and insulin resistance in mice. Food Chem. 2013 Dec 15;141(4):3627-35. doi: 10.1016/j.foodchem.2013.06.028;* *https://pubmed.ncbi.nlm.nih.gov/23993530/*
54. *Mittal R, Gupta RL. In vitro antioxidant activity of piperine. Methods Find Exp Clin Pharmacol. 2000 Jun;22(5):271-4. doi: 10.1358/mf.2000.22.5.796644;* *https://pubmed.ncbi.nlm.nih.gov/11031726/*