



Marathon-Crossfit

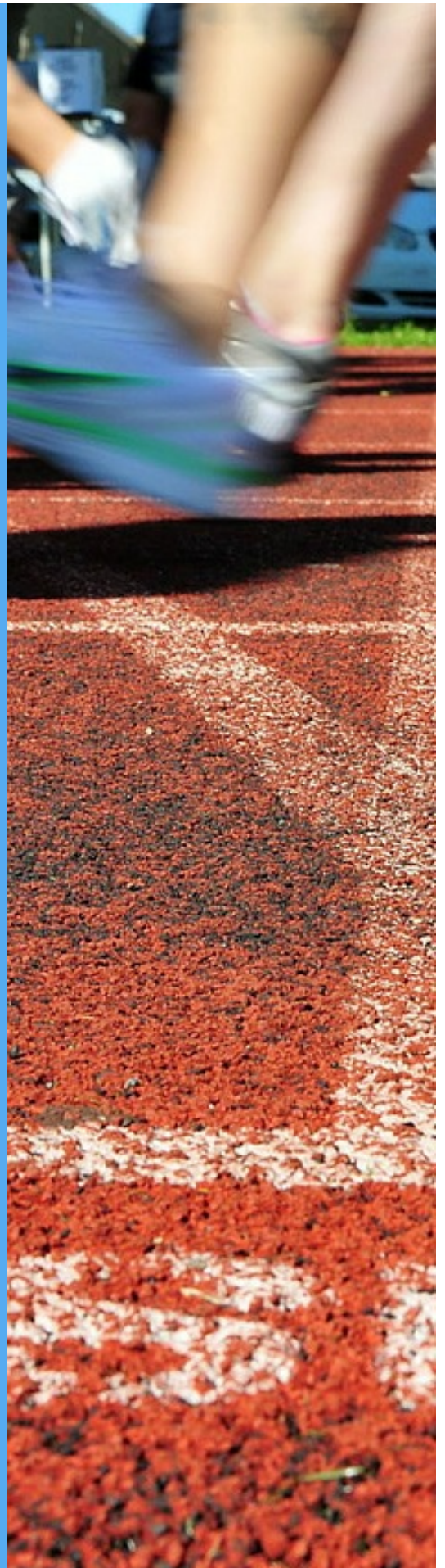
Supplements

An overview of the most commonly used sports supplements

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Introduction

Staying on top of your diet is hard. Supplements can be a blessing in disguise or a bottomless pit for your money. This eBook is the result of many hours of my own research into the topic so that you can make the right choices.

When I started on my fitness journey in 2013 I was all over supplements and a victim of marketing. During the years I came more and more to the conclusion that supplements are only for high end athletes, if needed at all. I hope this eBook will save you money, avoiding some of the mistakes I made.

What we will cover

Chapter one will present you with an overview of the business of supplements. In the end it is an industry designed to sell you products and should be viewed as such. Chapter two will discuss the most commonly sport supplements in alphabetical order. By the end of the book you will know:

- Benefits of the most common sports supplements
- Risks of the most common sports supplements
- Prices of the most common sports supplements
- Gained links to sources to make up your own mind

Do not believe what you are fed on the product descriptions and do your own research like I did. Downloading and reading this eBook will set you apart to make better choices for yourself.

Pascal Landshöft

About The Author

Marathon Crossfit was started by me in 2013 when training for the Dublin Marathon. I hold the records for the squat, deadlift and bench press in my local gym and regularly compete in local runs.

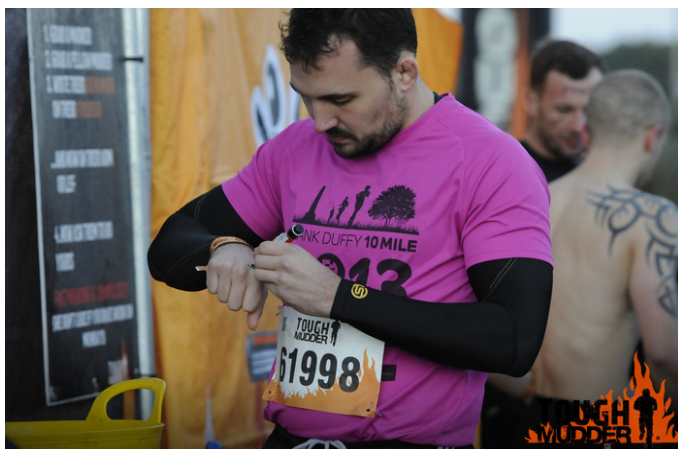
In 2013 my now wife turned around to me and said "You have become unattractive to me, if you don't change, i will leave you". This was a wake up call to me. Back then I worked in a stressful job with regular nose bleed whenever I something did not according to plan. Since then a lot happened.

The road to health

Since then I have changed my diet by cutting back on alcohol, sugar and carbohydrates, ran three marathons and got to a level of fitness I never had before in my life. I lost 15 kg in 2013 and since then have rebuild 10kg in muscle mass.

My idea

While I was travelling for the marathon I found that there are little people out there I describe the full challenge of having a job, teenagers and staying fit and healthy. You find a lot of "bros" in their mid twenties pumping it up who I could not relate to on a deeper level. Therefore I took up the challenge to document my progress and inform in a hopefully more professional, adult, toned down way.



Definition & Market

In this part of the eBook you will get an overview of what a supplement is and what the market for supplements worldwide looks like. This will help with context for each separate supplement we are discussing in this through the material

What are supplements ?



What are supplements ?

This will be an overview of the official definitions by two main authorities, some examples of real life products and how they are being marketed, benefits of risks of supplements and a final conclusion. Supplements are concentrated sources of nutrients (or other substances) with a nutritional or physiological effect according to the EU. Overall you can take away that more vitamins and minerals do not necessarily mean better and that the benefits of supplements are small to non-existent except you have a special condition for which you would have to consult a doctor anyway and probably would get a prescription drug instead of a dietary supplement.

Official definitions

There are two main sources for official definitions for supplements. While these might

vary in different countries based on local law and regulation we will stick to these for the purpose of this article to give you an overview of what supplements are to then dive deeper yourself.

The [United States Food and Drug Administration](#) defines [supplements](#) as followed:

A dietary supplement is a product intended for ingestion that contains a "dietary ingredient" intended to add further nutritional value to (supplement) the diet. A "dietary ingredient" may be one, or any combination, of the following substances:

- a vitamin
- a mineral
- a herb or other botanical
- an amino acid
- a dietary substance for use by people to supplement the diet by increasing the total dietary intake
- a concentrate, metabolite, constituent, or extract

Dietary supplements may be found in many forms such as tablets, capsules, soft gels, gelcaps, liquids, or powders. Some dietary supplements can help ensure that you get an adequate dietary intake of essential nutrients; others may help you reduce your risk of disease.

The [European Commission](#) defines the products in this category in this way:

As an addition to a normal diet, food business operators market food supplements, which are concentrated sources of nutrients (or other substances) with a nutritional or physiological effect. Such food supplements can be marketed in "dose" form, such as pills, tablets, capsules, liquids in measured doses, etc.

You already can see that the definitions are quite different. While the EU names "Concentrated sources of nutrients with a nutritional or psychological effect" the FDA names it a "product intended for ingestion that contains a dietary ingredient" to then move on to define what a dietary ingredient is. So to me, it seems like the FDA is a bit more specific, while the EU intends to be broader. Both bodies seem to agree generally in which forms supplements are being produced and brought to the shelves.

Personally, I like the description [which is given on Wikipedia](#), even though I will earn some criticism for citing the online encyclopedia as a source, which states:

A **dietary supplement** is intended to provide [nutrients](#) that may otherwise not be consumed in sufficient quantities.

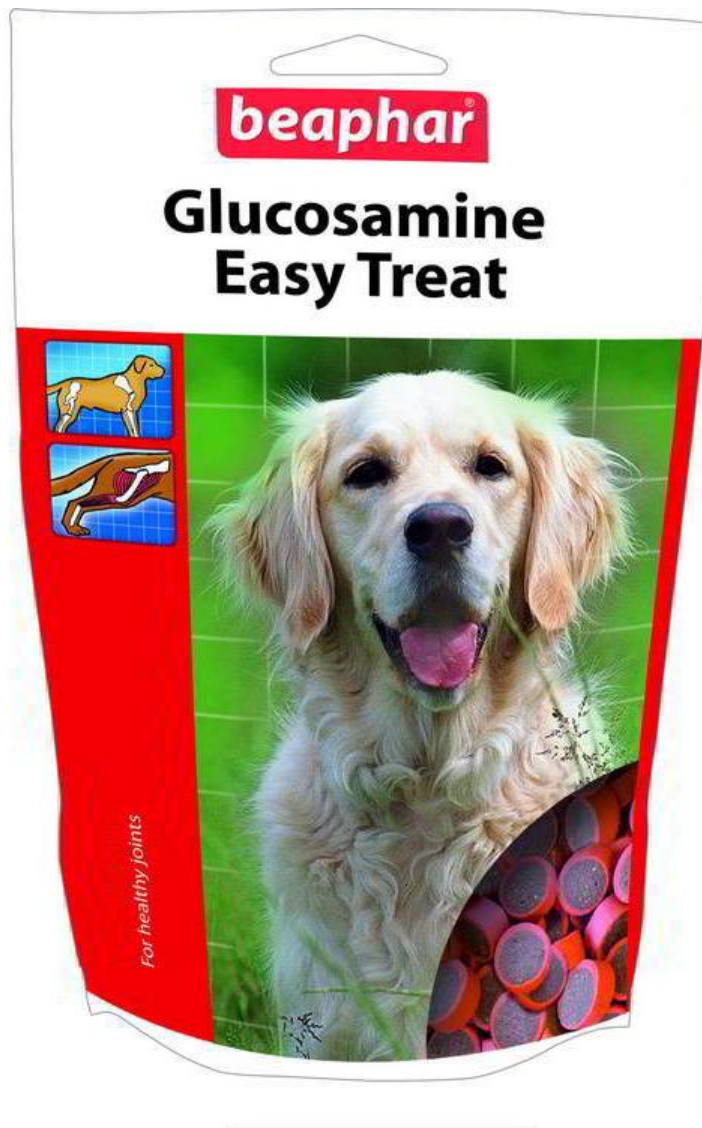
is this is more accessible to me. Based on which country you are in dietary supplements might be classified as foods, drugs or other which determine whether they are freely available without a prescription for consumption. Consult your local doctor and authorities for specifics.

Forms and marketing of supplements

Supplements come in [many forms](#) like

- Tablets,
- Capsules,
- Softgels
- Gelcaps
- Liquids
- Powders
- Energy bars

one of the newer trends is that the lines between food and supplement blur more and more. In Ireland, you will find Protein enriched milk on the shelves or omega 3 bread and the likes. As the consumers become more health conscious, products develop to address these needs. Depending on the target group, packaging, wording and presentation may vary greatly. Here are some examples:



Here we have glucosamine for dogs. Yes, you are seeing right. What works for granny, grandad and marathon dad to keep their joints in check also should work for Wautzi. One of my personal favorites.



Same thing, but probably being handed to you in a pharmacy when you ask for pain relief in your joints after strenuous exercise. Probably you would get more bang for your bug with the dog food if you wanted to maximise your glucosamine intake.



Here you have a selection of sports supplements in the form of [whey protein](#). Notice that these tubs mainly work with black and red, which are pretty aggressive colour combinations compared to the packaging of the aforementioned Glucosamine. That these containers are all also pretty big on the shelf is in my opinion also no coincidence as they promote muscle growth and their target group is 15 - 30-year-olds mainly.

In America, [dietary supplements can not claim to](#)

- Diagnose
- Cure
- Treat
- Prevent

diseases as they then would be classified as drugs and would fall under stricter regulation. This might also mean that depending on where you buy your supplements you might need a prescription or not. This might be one of the reasons why E-Commerce is rising in revenue streams for this kind of products as it opens an opportunity to get a supplement which you would need a prescription for your in your country without a prescription from somewhere else.

[Popular dietary supplements](#) include

- Calcium
- Echinacea
- Fish Oil
- Ginseng
- Glucosamine and/or

- Chondroitin Sulphate
- Garlic
- Vitamin D
- St. John's Wort
- Saw Palmetto
- Ginkgo
- Green Tea
- Vitamin E
- Calcium
- Ironherbs
- Probiotics

This is just a little insight into the world of supplement marketing. Always be aware that these supplements usually live in the realm of making you believe that they provide the benefits of prescription drugs while being risk-free, even though they have been regulated less strict and therefore not tested as professionally (and expensively). This also results in several cases in which dietary supplements have been found to be mislabeled overstating or understating the true ingredients. Here one statement from a [study done by labdoor on probiotics](#):

"Total viable bacteria ranged from -99% to +2400% vs. the products' stated label claims (-24.975 billion CFUs to +120 billion CFUs)."

One of the biggest scandals of mislabeling which I have personally witnessed was the 2013 Horse Meat scandal in the UK and Ireland in which [low quality minced beef was found out to have up to 29% equine meat in it](#). Another example would be the huge Durham [trial that was done in the UK with claims that fish oil would enhance the intelligence of children... which turned out it doesn't](#).

Benefits of supplements

While supplements are no substitute for a healthy diet they can help you to get the nutrients which you might not get otherwise. There is some evidence that creatine and protein supplementation is beneficial for vegetarians, as they miss out on meat, one of the prime deliverers of protein. With age, you also might want to supplement to counterbalance that your body will not produce as much of a certain nutrient anymore. For probiotics, there was some beneficial impact recorded to help to keep a healthy gut flora when being on antibiotics, as the antibiotics kill the bacteria you replenish by taking probiotics. [Iron is supposed to help prevent anaemia while and fish oils are said to have benefits for heart diseases](#).

If you have a deficiency for a certain nutrient based on your medical record, due to medication or lifestyle choices speak to your GP to get clarity whether dietary supplements make sense for you.

The [harvard medical school states in one of their articles that most of the benefits of dietary supplements are observational and could not be reconstructed in randomised trials against placebo.](#)

Risks of supplements

One of the worst combinations in the internet age are self-diagnoses followed by self-treatment with dietary supplements. Please consult your doctor and get proper medication if you are ill. Here are some of the risks of supplements I have found. This is just an overview, not an all encompassing list

- Vitamin K can reduce the effect of the blood thinner Coumadin
- St. John's root can speed up the breakdown of drugs like antidepressants and birth control pills and therefore reduce their effectiveness
- Vitamins C and E might reduce the effectiveness of some types of cancer chemotherapy.
- Very high levels of vitamin A can cause headaches and liver damage, reduce strength and cause birth defects
- Excess iron can have similar effects like an excess of vitamin A
- Glucosamine has bad interactions with warfarin
- Vitamin E, which was initially thought to protect the heart, was later discovered to increase the risk for bleeding strokes

To prevent yourself getting something that might harm you here are some guidelines when choosing a supplement:

- It is too good to be true, it usually isn't
- Natural does not mean safe (think of a cobra bite, natural...but you are still dead)
- If something which is sold over the counter states that it is better than a prescription drug, it probably should not be sold over the counter
- Safety is more important than your gains, pain relief, etc. the wrong tablet at the wrong time will only make you worse
- Get your information for your final decision from a doctor or at least from a local government website like
 - NIH
 - FDA
 - USDA

- Website of the European Commission.

And here a final quote from the FDA on why you should be careful:

While the supplement company is responsible for having evidence that their products are safe and the label claims are truthful and not misleading, they do not have to provide that evidence to the FDA before the product is marketed.

Conclusion

Supplements are products which usually come in tablet, powder or capsule form and are still classified as foods and therefore do not have to forego the scrutiny of testing which prescription drugs have to undergo. In most cases, they provide nutrients in concentrated form to bring up the daily uptake. For most of the products brought to market, there are no long-term controlled studies available. For the supplements where there are long-term studies they more often than not do not show any better result than placebo. As long as you do not have a factor which already inhibits the intake or processing of a specific nutrient, it is very likely that the benefit you gain from a supplement is marginal to non-existent. This excludes the placebo effect, which is a beast on its own and sometimes shows real world benefits, which are caused not by the supplement, but the ritual of taking a pill.

Further Reading

Which supplements are sold the most ?



Which supplements are sold the most ?

This is not a comprehensive study done by multiple market researchers and business analysts, but a look at the most readily available data online to answer this question generally and quickly with a bit of underlying detail. Based on what I could gather vitamins are likely to be the most sold supplements worldwide. Within the world of sports nutrition, protein seems to take the top spot.

Dietary supplement definition

To determine which of a certain thing is sold the most you have to actually define what is within and out of scope for that very market. Here the challenges already begin. [Due](#)

to the rapid growth of supplements and them becoming more mainstream, the lines between food and dietary supplements become more and more blurred as products become more diversified. Here are some definitions of dietary supplements by authorities:

European Commission

As an addition to a normal diet, food business operators market food supplements, which are concentrated sources of nutrients (or other substances) with a nutritional or physiological effect. Such food supplements can be marketed in "dose" form, such as pills, tablets, capsules, liquids in measured doses, etc.

US. Food and Drug Administration

A dietary supplement is a product intended for ingestion that contains a "dietary ingredient" intended to add further nutritional value to (supplement) the diet. A "dietary ingredient" may be one, or any combination, of the following substances:

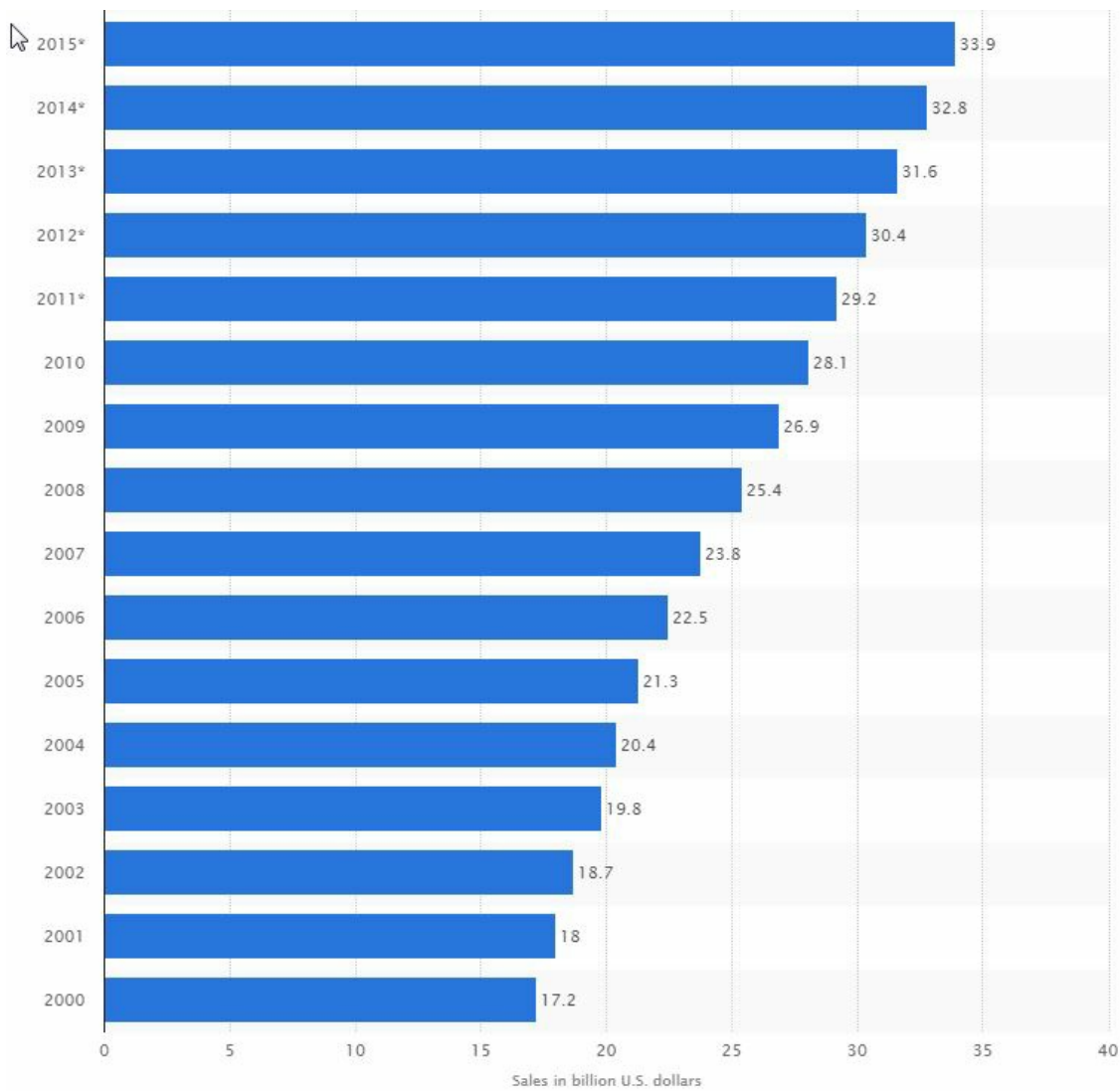
- a vitamin
- a mineral
- a herb or other botanical
- an amino acid
- a dietary substance for use by people to supplement the diet by increasing the total dietary intake
- a concentrate, metabolite, constituent, or extract

Dietary supplements may be found in many forms such as tablets, capsules, soft gels, gelcaps, liquids, or powders. Some dietary supplements can help ensure that you get an adequate dietary intake of essential nutrients; others may help you reduce your risk of disease.

Overall you can say that if it is a pill that you buy over the counter without a subscription that provides additional nutrients to you, it is most likely a dietary supplement.

Dietary supplementation market

Below you find the US dietary supplement market in billion dollars from the year 2000 up to 2015 as published on [statista](#). You can see that the volume of the market doubled within 15 years. Some considerable growth here. In 2006 [out of the 22.6 billion vitamins took a share of 7.2 billion \(31%\)](#) home.



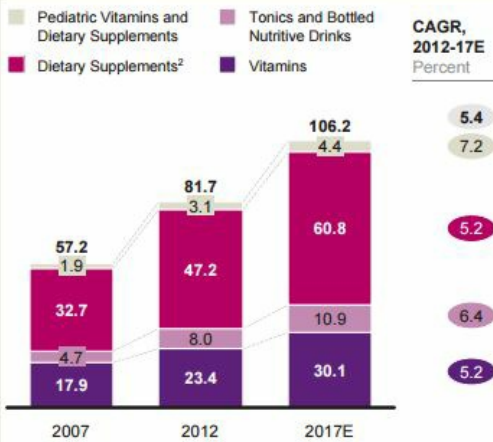
© Statista 2016

Depending on the source and the method of how to estimate the total market size the numbers can vary quite considerably. In 2015 an argument took place between the TABS Group and Nutrition Business Journal about how to measure the market. If we stick with the definition of the FDA and European commission the overall market size is bigger and seemingly closer to the Nutrition Business Journal's estimates (give or take a billion here or there). The [NBJ: 'The US supplement industry is \\$37 billion, not \\$12 billion'](#) article is an interesting which should show you why definitions of a market are so important to answer the question "which supplements are sold the most". Other studies claim [18 billion Dollar for the period of 2016](#).

In a [Mckinsey Report](#) written by Warren Teichner and Megan Lesko in 2013 based on [Euromonitor data](#) on the dietary supplements, the consulting firm states that the world market for these products was estimated at 82 Billion U.S. Dollar with the US market taking a share 28%. Vitamins, minerals, nutritional and herbal supplements (VHMS) manufacturer are stated to be highly fragmented with the leading manufacturer only taking 7% of the entire market.

**Exhibit 1:
VMS segment overview**

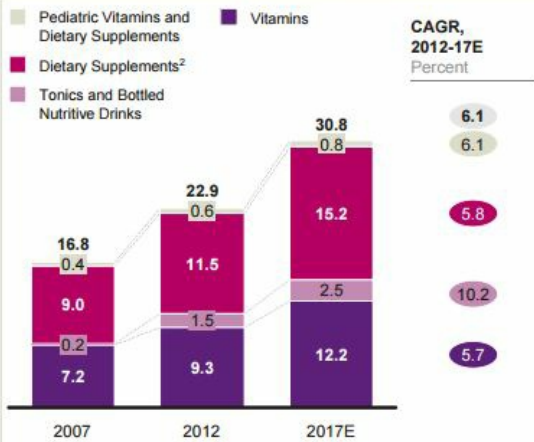
Global Vitamin, Mineral and Supplement market¹



Source: Euromonitor
 1. Market size based on retailer sales
 2. Includes herbal and combination dietary supplements

Source: Euromonitor, team analysis

US Vitamin, Mineral and Supplement market¹



Source: Euromonitor
 1. Market size based on retailer sales
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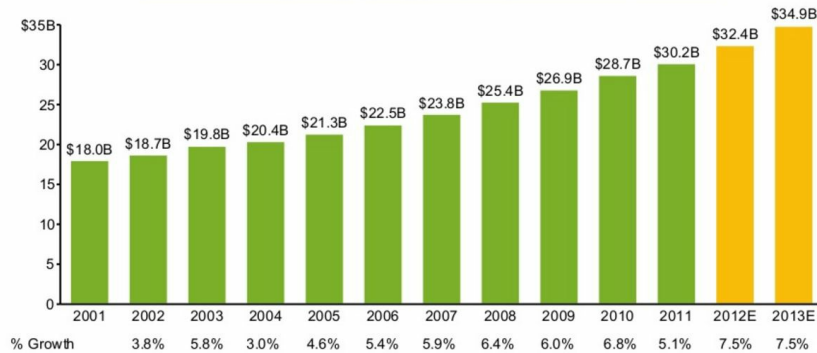
In a graphic from that same report as above you can see that the single most sold category within the VHMS market in the US is Vitamins as the dietary supplements category is an aggregate for this very report. In addition, the statista and Mc Kinsey numbers which are derived from Euromonitor do not seem to add up. Here you would have to double check what has been done in total to the Euromonitor data and which assumptions have been made to account for these.

A [SlideShare from Partnership Capital Growth](#) utilising data from the [Nutrition Business Journal](#) provides similar developments and data for the US Market as mentioned in the statista report in this article. The number for 2011 is quite close and the predictions for 2012 and 2013 a bit too positive. The first can be explained by different rounding techniques for both approaches through an entire report which shows results in billions, the latter is too be expected when business analysts talk about future developments in growing market.

SUPPLEMENT INDUSTRY OVERVIEW KEY FACTS & FIGURES

The U.S. supplement industry has demonstrated strong and consistent growth throughout the years and varying economic climates, with no declines in over a decade.

U.S. SUPPLEMENT INDUSTRY RETAIL SALES



- The U.S. supplement industry has seen a compound annual growth rate of 5.2% over the last decade (vs. ~1.7% real U.S. GDP growth from 2003-2012)
- In 2013, NBJ anticipates a continuation of the strong growth rate seen in 2012E as VMHS continue to move into the mainstream

NOTE: Forward estimates including 2012 were created in May and do not reflect NBJ's current best estimates. NBJ will update its estimates in its June/July 2013 Industry Overview issue, which will be available at www.nutritionbusinessjournal.com/nbj

Sources: Nutrition Business Journal (NBJ) 4

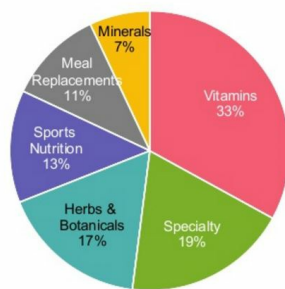
The first pointers to vitamins being the stringest player within this segment still hold true as the following graphic shows

SUPPLEMENT INDUSTRY OVERVIEW KEY FACTS & FIGURES

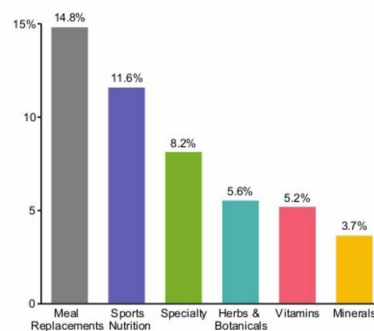
Looking at sales by product category, Meal Replacements showed the greatest growth in 2012E, followed by Sports Nutrition. Vitamins, which remain the largest category, have also sustained strong growth rates.

SUPPLEMENT SALES & GROWTH BY PRODUCT

2012E SUPPLEMENT SALES BY PRODUCT TYPE



2012E SUPPLEMENT SALES GROWTH BY PRODUCT TYPE



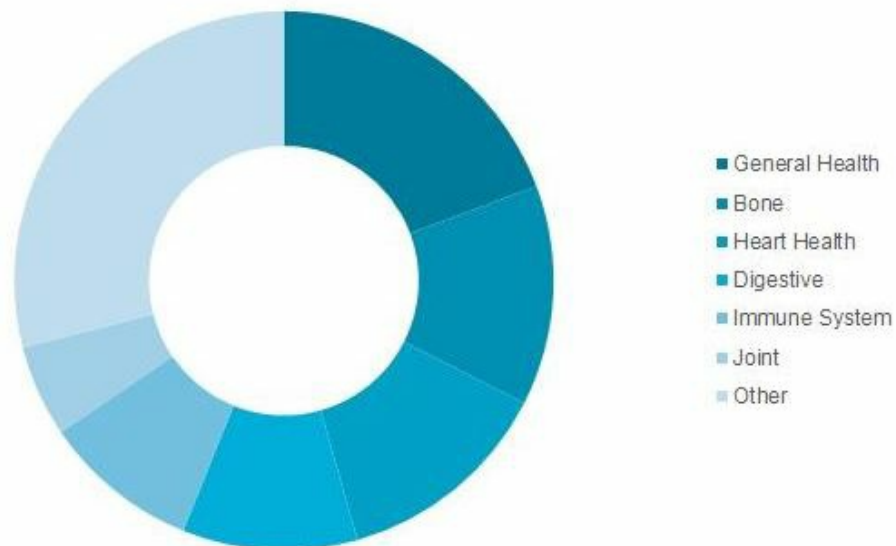
NOTE: Forward estimates including 2012 were created in May and do not reflect NBJ's current best estimates. NBJ will update its estimates in its June/July 2013 Industry Overview issue, which will be available at www.nutritionbusinessjournal.com/nbj

Source: NBJ 5

Vitamins took the lion's share of the market for this report in 2012 with 33% of the 30.2 billion US Dollars which are stated. The highest growth rates are to be seen in the meal replacement and sports nutrition subgroups of the market with year over year growth of respectively 14.8% and 11.6%.

While most reports look at which type of supplement sells the most Chris Schmidt from Euromonitor had an interestingly different approach in a graphic on the [euromonitor blog](#) which looks at the positioning of these products on the shelves regarding their promised benefits.

US DIETARY SUPPLEMENT SALES BY POSITIONING IN 2013



Source: Euromonitor International

The article points out that the players in the market are more and more moving away from general health statements to sell their products to very specific purpose built formulations. In this pie chart reflected in the big chunk which the category other takes up of the total. As consumers get more educated via freely available information [long tail marketing](#) becomes more and more relevant to value-driven buyers.

The European market is a lot smaller than the American VHMS market at 7.2 Billion USD. This might be due to the fact, that in Europe shows like the doctors and celebrities making health claims like in the states (Deepak Chopra for example) are viewed with more scrutiny and get less airtime. The top five markets are in order Italy, Germany, Russia, UK and France. While the german market is shrinking Italy and Russia are showing strong growth. You can see all the detail in [Number cruncher: Europe's key supplement markets, brands & opportunities revealed](#) which is based on Euromonitor data.

All in all the most sold supplements seem to be vitamins if you take the global market and data which has been collected for this article into account. As I especially focus on nutrition for sports purposes in my blog the next step is to drill a bit deeper into this segment. To achieve this we will steer away from the analysts reports

which are more intended for the C-Level investment bankers and have a closer look at the E-Commerce channel for dietary supplements.

Most sold supplements online

In this section, I had a look at amazon.com and bodybuilding.com and their best selling dietary supplements according to their websites. While bodybuilding.com should have a strong bias towards muscle growth and sports nutrition it should be expected that this bias is less pronounced on amazon.com as the website is more geared towards the general populace.

The [best selling products according to boybuilding.com](#) are in order:

1. [Optimum Nutrition Gold Standard 100% Whey](#)
2. [Evlution Nutrition Lean Mode](#)
3. [JYM Pre JYM](#)
4. [Cellucor C3](#)
5. [Optimum Nutrition Essential Amino Energy](#)
6. [JYM Pro JYM](#)
7. [Evlution Nutrition ENGN](#)
8. [Muscle Pharm Combat Crunch Bars](#)
9. [Cellucor COR Performance Whey](#)
10. [JYM Post JYM](#)
11. Muscle Tech Platinum 100%
12. EVlution Nutrition CLA 1000
13. BSN Syntha 6
14. EVlotion Nutrition BCAA Energy
15. Muscle Tech Platinum Multivitamin
16. BPI Sports Best BCAA
17. EVlution Nutrition Trans4orm
18. Blender Bottle Classic
19. Dymatize ISO 100
20. Muscle Tech Hydroxycut Hardcore Next Gen
21. EVlution Nutrition Stacked Protein
22. Scivation Xtend
23. Optimum Nutrition Opti Men
24. Muscle Pharm Combat 100% Whey
25. JYM OMega JYM
26. JYM Vita JYM
27. Universal Nutrition Animal Whey
28. RSP Nutrition Quadra Lean

29. Muscle Tech Nitro-Tech
30. True Grit Test Booster
31. EVlution Nutrition EVLTEST
32. JYM ZMA JYM
33. Quest Nutrition Quest Bars
34. RSP Nutrition CLA
35. BPI Sports Best Vreatine
36. JYM Shred JYM
37. Optimum Nutrition Gold Standard 100% Casein
38. BSN Amino x
39. GAT Nitraflex
40. Optimum Nutrition Micronized Creatine Powder
41. JYM Alpha JYM
42. RSP Nutrition L-Carnitine
43. EVlution Nutrition VIta BCAA 5000
44. EVlution Nutrition VItaMode
45. RSP Nutrition AminoLean
46. Pro Supps Mr.HYDE
47. JYM Post JYM Carb
48. RSP Nutrition DyNO
49. Universal Nutrition Animal Pak
50. Muscle Pharm BCAA 3:1:"

In [amazon's case](#) we are looking at:

1. 100% Pure Garcinia Cambogia Extract
2. Hyperbiotics Pro-15
3. Orgain Organic Protein
4. Optimum Nutrition Creatine Powder
5. Culturelle Probiotics for Kids
6. SmartyPants Kids Complete Gummy Vitamins
7. Optimum Nutrition Whey Gold Standard
8. Doctor's Best High Absorption Magnesium
9. Dr. Tobias Omega 3 Fish Oil
10. Natrol Biotin 10.000 mcg Maximum strength
11. Nature's Bounty Probiotic 10
12. Doctor's Best High Absorption Coq10
13. Nutrition Essentials Probiotic
14. Nature Wise Cla 1250
15. Ddrops Bay 400IU

16. SugarBearHair Vitamins
17. Dr. Tobias Colon: 14 Day Quick Cleanse
18. Vitafusion Multivite Gummy Vitamins
19. Biotin 5000mcg

as of 23rd of July 2016. We can see that protein seems to take a stronger hold here as it would be in the larger scale total market analysis we looked at before.

Conclusion

If you wanted a simplified answer to the question which supplements sell the most it would be vitamins most likely driven mainly by multivitamin sales through supermarkets. To me this makes sense when I look at my own household and also think about that vitamins are taken for various reasons not only by sports enthusiasts. If you narrow it down to sports nutrition it looks a lot like that protein and above that whey protein seem to be the most sold in this category.



Supplements

The following pages will provide an insight and links for your own research in the most commonly used supplements paired with my personal experience.

Supplements: Colostrum



Supplements: Colostrum

I personally have not tried colostrum yet and I am not a doctor, so please always double check before supplementing it. Colostrum is not suitable for vegetarians and individuals who are allergic to milk products. All in all, colostrum seems to be a more natural, more active growth, more expensive supplement which can replace your [whey](#), casein, and creatine diet components if you can afford it.

What is colostrum ?

Colostrum is a special type of mother milk which is produced by mammals right before birth. It has less volume and more nutrients than the milk which is being produced after birth. Therefore, colostrum has [higher concentrations of growth hormones, proteins, and ingredients which strengthen the immune system](#). As the digestive systems of

young mammals have to develop and therefore can not process high volumes of milk this is beneficial to the newborn. [Think about colostrum as a super food for newborns to grow quicker and immunise them.](#)

What are the benefits of colostrum ?

The Australian Olympic team claims a correlation between their successes in 2000 and 2004 and the supplementation of their athletes with colostrum. This led to an inquiry whether colostrum should be banned. The result was that colostrum was deemed natural and legal to use as a superfood to supplement. The claimed benefits are:

1. Increased endurance
2. Quicker recovery
3. Improved function of the immune system
4. Prevention of leaky gut (found in long distance runners... yes it is what it sounds like)
5. [Showed positive effect in fighting HIV in clinical studies](#)

All in all if you look at [several sources](#) it seems to have the same benefits as whey protein, casein and creatine, with the two added bonuses of being natural and also have ingested growth hormones, which the former three supplements have not. [Here is the most interesting report about colostrum I have found](#), which praises its benefits mainly, while talking about downsides briefly.

How much do you have to take ?

The Most common number I have found is 60 grams a day. Greg Everett talks in Olympic weightlifting of an amount of 20 - 23g a day. In my personal opinion 60g a day seems a bit excessive, unless you are training 3 - 4 times a day if I base it on creatine consumption. Colostrum is described in some circles as the "new creatine" therefore treat it accordingly.

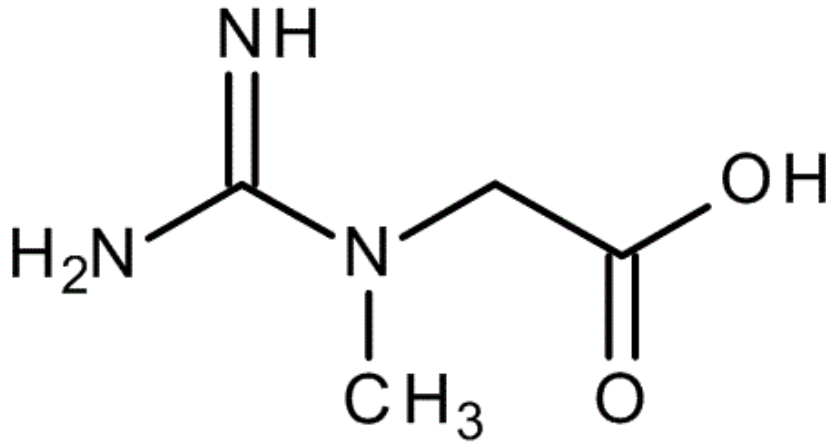
What are the downsides of colostrum ?

If you already have cancer there is a good chance that colostrum will contribute to it growing more quickly. There seems to be no clinical evidence at this stage that it can be the cause of cancer. The other downside is the price. Compared to creatine you have to pay about 5 - 10 times more for colostrum than for the same amount of creatine. In addition, there is a high likelihood that all of the additional effects compared to more common protein supplements caused by the growth hormones will not take effect for adults due to their fully developed digestive systems.

Conclusion

All in all, if you can afford it, colostrum seems an interesting alternative to protein + creatine supplementation on a natural basis. Even if the adult digestive system destroys most of the benefits, if only some of them take hold, you have the better product compared to protein only. The fact that it is more natural than the highly processed creatine is also not to be underestimated if the quality of your supplements is of special importance to you. The more I learn about supplements it seems to me that all of them could cause and prevent cancer at the same time, depending on which study you consult. So shockingly enough, I exclude this as deciding criteria, as I want to supplement. The only way to get around that risk is not to supplement at all (and then you might cancer from the stuff that your couch is made of... so, either way, you are screwed...). On a positive note, creatine and protein have helped my to reach my strength goals.

Supplements: Creatine



Supplements: Creatine

This article summarises points about the supplement creatine based on my personal experience and information that can be found publically. I am not a doctor or nutritionist, so please consult your doctor first and get your current health levels checked before you decide to supplement with anything. All in all, creatine seems to work for small performance increases for anaerobic exercises for most individuals with little studies available for long term implications and consequences especially for the kidney and liver, where most of the bodily processes to create and process creatine before it goes into the blood stream take place.

What is creatine ?

Creatine occurs naturally in the body and is formed from glycine and arginine. It was [discovered in 1832 by Michael Eugene Chevreul](#), synthesized first in the 1970s and had a surge in popularity in during the 1990s. The synthesis of creatine takes place in the liver and kidney. 95% of creatine in a human body can be found located in the skeletal muscle and a bit half of it originates from food, especially meat. The levels of creatine in meat can also be used as an indicator for its quality. [Oral supplementation for healthy individuals seem to be safe between 1 to 20g a day](#) and there is [evidence that](#)

supplementation with creatine seems to work to enhance athletic performance. Based on which studies you look at most benefits can be seen high-intensity work and explosive exercise. There seems to be very little positive impact for endurance athletes.

The 1992 Olympics in Barcelona had Linford Christie, Sally Gunnell and Colin Jackson take home medals and report on the use of creatine in the preparation for their competition. One of the first products to be available for purchase in the UK was phosphagen, a creatine monohydrate complex. There studies which show an performance increase for anaerobic repetitive work when using creatine in the range of 5 - 15% and for single effort work like Olympic weightlifting in the range of 1 - 5%. This is achieved by increasing the likelihood of nuclei donation from the satellite cells to the muscle cells, lowering myostatin levels, a protein which limits the growth of muscle and increasing testosterone as well as dihydrotestosterone levels. In industrial environments creatine is produced from sarcosine and cyanamide. An indicator of quality for creatine is the granularity. The more granular the produce the easier it is soluble in liquids for consumption and the costlier was the production of the end product as it has been milled for longer. The recommended form which is said to have the highest impact is powder of creatine monohydrate. Any other products like creatine in liquid or capsule form are deemed to be inferior to creatine monohydrate proper in its effectiveness.

There are no conclusive studies on the timing of supplementing creatine. There seems to be a consensus that it has to be taken shortly before, during or shortly after exercise as it is related to the speedy ATP process of the body and the energy chain related to it. One trick I found on the internet is to mix it with fruit juice rather than other liquids to enhance its effects leveraging the extra sugar supply.

Side effects of creatine

Creatine is very popular nowadays as it is widely distributed and can be obtained without a prescription. There are no good long-term studies available as of now regarding the effects of the body as it only has been around for 20 years (you would consider that a long time, but when it comes to long-term broad studies it actually isn't. (Read Ben Goldacre's book "Bad Pharma" if you want to understand the nature of medical tests in more depth) Apparently, 8% of adolescents take creatine and this number goes up to 40% amongst college and professional athletes. Reported side effects are:

- weight gain caused by higher water retention
- muscle cramps
- upset stomach

- diarrhea
- dizziness
- high blood pressure

There is a debate whether these side effects are of a more anecdotal nature than real, as there have been problems to reproduce them in short-term clinical studies. So if these side effects persist and harm especially the livers and kidneys, effects are most likely to show after years of use. Diabetes medication, acetaminophen & diuretics can have dangerous side effects with creatine. So if you are a diabetic or have liver / kidney problems it is recommended to not supplement with creatine. If you want to dive deeper into the matter there is an interesting [article on creatine linking it to the death of rugby player Jonah Lomu](#). Here are some direct quotes:

In 2013 the Irish Sports Council recorded 56 separate requests online to check if Creatine was on its prohibited substances list. The IRFU states on its website that it "strongly advises against the use of nutritional ergogenic aids, in particular, Creatine, in young players under 18 years of age".

"Taking Creatine may cause stomach cramps, diarrhea, and renal issues," says Tom Coleman, a health scientist and consultant specialising in performance and recovery and founder of My Nutrition.

The article itself is most critical in the use of creatine for minors in sports environments, especially those which emphasize strength, like rugby, football, and martial arts.

Personal experience with creatine

I used creatine the first time at 16 to bulk up one weight class in Judo from -73 to -81 as I could not make the cut anymore for the lower weight class. I used it for a month for the desired result as I seemed to have responded very well to it packing on about 6 -7 kg in mass. I did not change my training routine and my diet stayed the same. I personally did not experience any of the described side effects when I was younger.

After leaving school for college I quit Judo and fell into bad habits during my first years in my professional life. I found my way back to exercising regularly against a certain goal set in 2013 preparing for my first marathon. In 2015 I switched gears to weightlifting only and work my way up to a 200kg squat. I am supplementing creatine at the moment but the effects are not as obvious as when I was a teenager. I experience some of the side effects at times, but I personally can not say whether they are just related to me being older and having a generally more fragile digestive system or the creatine itself. If I cut out my whey protein and the creatine for a time I definitely feel less bloated. I do not experience any creepy / severe side effects which would make me

worry.

Conclusion

Overall creatine seems to work for small performance increases for non-endurance athletes. It seems to be relatively safe as there are generally seem to be no big side effects and it is widely traded over the counter as an oral supplement. (Cynics would at this point say that same goes for alcohol) There is a lot of debate and advice around that minors should stay away from it so I personally would be a bad example. There were multiple mentions in my research that creatine supplementation is a high risk for patients with existing kidney and liver malfunctions. In fairness to creatine, though, if you have problems with your liver and kidney you are on a super tight diet plan anyway unless you want to needlessly experience pain and suffering followed by eventual death...

So overall it is up to you whether you want to take the risk of unknown long-term effects on your body as they are not studied to increase your performance in the gym or for the sport you do. Creatine works for that purpose if your body responds to it.

Supplements: Digestive Enzymes



Supplements: Digestive Enzymes

This is a write up discussing digestion and the role that digestive enzymes play in it. We will shortly cover that supplementation of enzymes can be helpful in cases of sickness and surgery, while the uses in sports might be far fetched. Please leave a comment or a

link to enhance the content or view it from an angle that I have overlooked.

What are digestive enzymes ?

[Digestive enzymes help you to break down the food you take in.](#) The process starts in your mouth, continues in your stomach and end in your intestines. There are several places where the enzymes are produced in the body the

- [Salivary glands](#)
- Secretory cells in the stomach
- Secretory cells in the [pancreas](#)
- Secretory glands in the small intestine

Different forms of enzymes are secreted from these sources. **Proteases** and peptidases split proteins into peptides and amino acids. **Lipases** split fat into three fatty acids and a glycerol molecule. **Amylases** split carbohydrates like sugars and starch into simple sugars like glucose. **Nucleases** split nucleic acids into nucleotides. Here is a list of some of the enzymes you can find in your system:

Digestive enzymes **in the mouth:**

- Lingual lipase
- Salivary amylase
- Lysozyme
- Haptocorrin

Gastric enzymes (enzymes secreted **in the stomach**)

- Pepsin (breaks down protein into peptide fragments and amino acids), produced by gastric chief cells
- Hydrochloride acid (stomach acid pepsinogen --> pepsin, kill bacteria and viruses), produced by parietal cells
- Intrinsic factor (helps digesting Vitamin B12), produced by parietal cells
- Mucin (protects from self-digestion by stomach acid), produced by mucous neck cells
- Gastrin (hormone, stimulates Hydrochloric acid and intrinsic factor production), produced by g cells
- Gastric lipase

Digestive enzymes **in the pancreatic juice:**

- Trypsinogen

- Chymotrypsinogen
- Carboxypeptidase
- Elastases
- Pancreatic lipase
- Sterol esterase
- Phospholipase
- Nucleases
- Pancreatic amylase

Digestive enzymes produced **in the small intestine**:

- Secretin controls the secretion of the small intestine
- Cholecystokinin, proteins, and fats
- Gastric inhibitory peptide
- Motilin
- Somatostatin

Brush border enzymes:

- Erepsin
- Maltase converts lactose to glucose
- Lactase
- Sucrase converts sucrose to disaccharides and monosaccharides

The **process which takes place can be described in short** as followed:

1. The digestive process starts with the release of salivary amylase in the mouth to assist in breaking down food in its molecules
2. This process continues in the stomach under the help of hydrochloric acid and pepsin together with other enzymes in which gastric amylase takes over from salivary amylase
3. After 60 to 90 minutes in the stomach, digestion continues in the duodenum where the hormone secretin is released
4. Secretin signals the pancreas to release further digestive fluids for which the most relevant contents are lipase, trypsin, amylase, and the nuclease.
5. Bicarbonate released from the pancreas switches the chyme from acid to alkaline so that beneficial bacteria can survive again and assist further in digestion

This is a quick overview of the digestive functions in our body and which role digestive enzymes play in it.

Why should you use digestive enzymes ?

There are several reasons for using digestive enzymes. Some of them can be that the [naturally occurring digestive to not function anymore](#) as you want because of:

- Diseases may prevent proper digestive enzyme production
- Pancreatic problems, including cystic fibrosis, pancreatic cancer, and acute or chronic pancreatitis.
- Brush border dysfunction, the most severe is long-standing Celiac disease, where the brush border is flattened or destroyed. Other diseases like Crohn's can also cause severe problems.
- Aging has been associated with decreased digestive function
- Low stomach acid
- Chronic stress

The symptoms you might have due to insufficient digestive enzymes are:

- Gas and bloating after meals
- The sensation that you have food sitting in your stomach (a rock in your gut)
- Feeling full after eating a few bites of food
- Undigested food in your stool*
- Floating stools (an occasional floating piece is fine, but if all your poop consistently floats, that might be a sign something is wrong)
- An "oil slick" in the toilet bowl (undigested fat)

Further reasons which might be more related to the world of sports can be:

- Need to take in more food in shorter time (Strongman athletes)
- Wish to absorb more nutrients per bite
- Get certain Nutrients to the muscle as quickly as possible after a workout

Whatever the reasons are, please always consult a doctor before taking digestive enzymes. If you are generally healthy there is usually no need to take supplements at all.

How to use digestive enzymes are available ?

There is a good description on how and which digestive enzymes to take at [Enzymestuff](#) here is an excerpt for you:

- gradually start a broad-spectrum enzyme product at meals until you get to 1 capsule at each meal
- gradually add in a strong protease enzyme product at meals until you get to 1 capsule at each meal
- gradually add in a probiotic between meals (or at the end of meals) until you get to

the recommended dosage. If you are already taking a probiotic, skip this part.

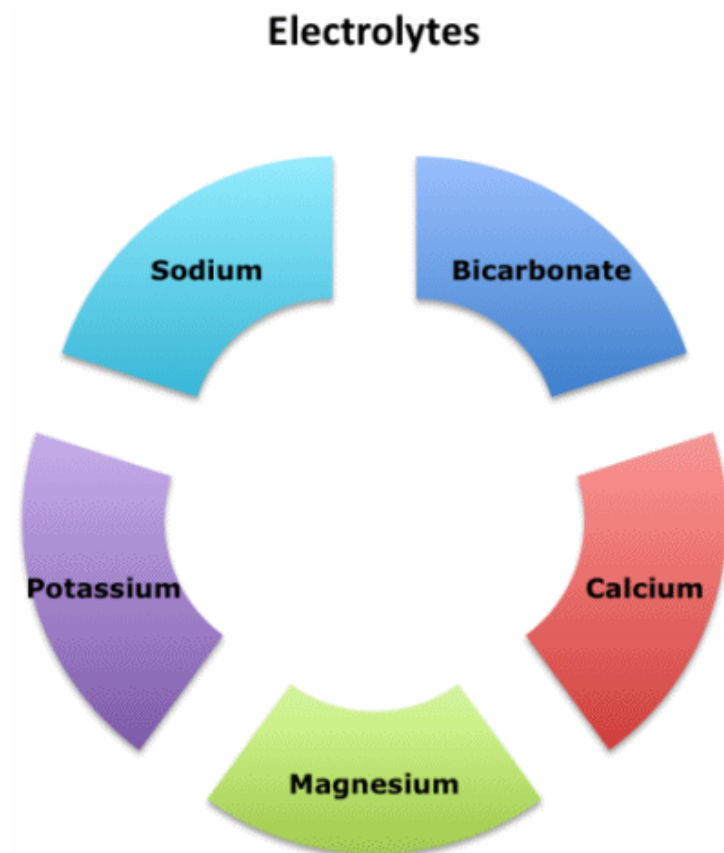
- gradually add in a yeast-targeting enzyme product between meals until you reach a comfortable level or 1 capsule 3 times a day.
- gradually add in a yeast killer between meals with the yeast-targeting enzyme product until you reach the desired level

Enzymestuff mainly discusses the use of digestive enzymes after you had minor or major problems with digestion. Applications for enhancement of sports performance are not being discussed. Recommended entry level products are [V-Gest](#) and [Lacto](#). Read the full post if you are interested in supplementing digestive enzymes for health purposes and discuss it with your doctor. I personally think it is a very detailed and interesting read.

Conclusion

The most I could find on digestive enzymes were discussions on medical uses after complications in the digestive system to rebuild it quicker to a former status. This makes sense to help the body digest food when the necessary enzymes and environment has been destroyed due to sickness and surgery. For me personally, I would be very skeptical when it comes to applying digestive enzymes to sports. The idea of artificially bump up your digestion rate take even more supplements in quicker does not seem like a sustainable and healthy approach to performance enhancement.

Supplements: Electrolytes



Supplements: Electrolytes

When you talk about electrolytes think sports drinks. Here is an overview of why and how you should supplement and what the risks and opportunities involved are. Please consult your doctor before making a decision on supplementing electrolytes and whether you have one of the mentioned symptoms or not, before taking action.

What are electrolytes ?



Electrolytes help you to transport information within your body via electrical charges to enable brain functions, muscle contraction, and transport of nutrients. [Here is a definition for electrolytes which I found:](#)

An electrolyte is a substance that produces an electrically conducting solution when dissolved in water. Electrolytes carry a charge and are essential for life. All higher forms of life need electrolytes to survive.

The most commonly known electrolyte is salt. Salt consists of Sodium (Na^*) and Chlorid (Cl^-). In its solid form, it is stored in any household. If dissolved into water, it creates a solution which is capable of transporting electrical charges. [Pure water does not carry electrolytes](#). This is also the reason why drinking distilled water and too much water can be harmful to you, as you create [Hypernatremia](#) by lowering the concentration of sodium in your bodily fluids. [Here are the main electrolytes in your body](#) :

- [Sodium](#)
- [Chloride](#)
- [Potassium](#)
- [Magnesium](#)
- [Calcium](#)
- [Phosphate](#)
- [Bicarbonate](#)

Sodium is mainly [found in the fluids outside of cells and plays a main part in the regulation of fluids](#) within the body. Potassium (K^*) [is concentrated most inside of your cells](#). Magnesium (Mg^{2*}) and calcium (Ca^{2*}) are closer to the blood stream of the body than to the cells (of course everything in the body is connected, so this is relative) and attach to [proteins](#). If there are calcium deficiencies detected in an individual the magnesium concentration usually has to be brought up first to achieve the goal of

calcium increase. Overall the body [closely regulates the balances of the electrolytes via hormones \(Renin, Angiotensin, Aldosterone, Vasopressin\)](#) which are mainly produced in the kidney and to some part in the heart, lungs, and brain.

Sodium helps to maintain the fluid balance to keep muscle contraction and nerve signalling up and running.

Chloride helps to maintain the fluid balance majority functioning as the chemical counterpart of sodium when solved in the bodily fluids.

Potassium stabilises blood pressure, regulates heart contractions and helps with the functionalities of muscles.

Magnesium has many roles including muscle contraction, regulating heart rhythm, nerve functioning, bone building, and strength, reducing anxiety, keep stable protein fluid balance and digestion.

Calcium forms and maintains bone and teeth. Supports blood clotting, cell division, muscle contraction and nerve signalling.

All in all a good electrolyte balance supports you in sports to perform at your best and avoid cardiovascular issues in endurance sports. Therefore, you should actively work on keeping the levels in balance when exercising hard.

How to take care of electrolyte intake ?

There are several factors playing into this. First and foremost your diet. The more processed food you eat the more likely it becomes that you are taking in too much sodium. Salt is an ingredient in processed food to make it more lasting and better tasting that you come back for more. By simply making your meals from scratch, rather than ready-made, you are already making a big step towards taking better care of your electrolyte intake.

While this will take care of most scenarios based on a healthy diet, marathoners and other athletes who are regularly exercising for a very long period of time (more than an hour) or have multiple very intense workouts planned through the day, want to go beyond just eating healthy. Electrolyte drinks are recommended for marathoners when running a marathon or their weekend long distance runs. A good rule of thumb for me when I was preparing for my three marathons in 2013 / 2014 was to drink every 30 minutes, slow a bit down for that purpose and drink about one cup. A cup is roughly two to three big sips out of a bottle. [Some experts recommend 1.5 to 2.5 cups on every hour of training.](#)

While I would not disagree with this fact, apply some common sense, also. Electrolytes need to be replaced because you sweat. My first marathon was a great example of that as I had some [SKINS A400](#) on which messed up my natural hydration. The result was, that I could literally scrap salt from the inside of the suite when I finished the marathon. The point I am getting to here is that you only need to drink if you actually exercise hard and sweat. The more you sweat, the more you have to drink water with electrolytes in it. So the hotter the climate, the longer and harder the workout and the more prone you are to sweating, the more you need to replace.

Also remember, if you are on a very tight diet to get ripped, that most sport's drinks will also use a lot of sugar to make themselves appealing to you. So drinking Gatorade, [the first ever of these sport drinks invented in 1965 in Florida](#), before and during exercise will help your electrolyte levels, but will also add some unnecessary sugar to your diet.

Greg Everett proposes to add half a teaspoon of common salt and half a teaspoon of potassium chloride to a liter of water to provide a home-made sugar-free alternative (I have not tried, so do not ask if this tastes nice, sounds horrid...). Here are the **levels of electrolytes** you should maintain:

- Calcium: 5–5.5 mEq/L
- Chloride: 97–107 mEq/L
- **Potassium**: 5–5.3 mEq/L
- **Magnesium**: 1.5-2.5 mEq/L
- Sodium: 136–145 mEq/L

As for natural sources of electrolytes here is a list of ingredients which help you to a [more balanced diet](#). Watch out for recipes / diet plans including these:

- Electrolyte drinks
- Coconut water
- Celery
- Watermelon
- Cucumber
- Kiwi
- Bell peppers
- Citrus fruit
- Carrots
- Cultured dairy (amasai / kefir /yogurt)
- Pineapple

Causes of Electrolyte imbalance

As with all causes of diseases / malfunctions in the body, there can be many causes for electrolyte imbalance. They cluster around losing too much water, keeping too much water in or hormonal defects which inhibit the ability to maintain healthy electrolyte levels. This can include, but still is not a full list of possible causes:

- Poor diet
- Vomiting
- Diarrhea
- Medication
- Alcoholism
- Heart failure
- Kidney disease
- Diabetes
- Eating disorders
- Severe burns
- Chemotherapy
- Excessive exercise

As a common sense approach, if you have to go to the bathroom a lot while exercising like a maniac and taking an assortment of pills because of your medical history while only eating processed food... look into electrolytes and a different approach in general. If you are eating healthy, do not take medicaments, have healthy urine (white to straw coloured) you are fine. You get the gist of this.

What are the symptoms of electrolyte imbalance ?

There are minor and major symptoms of electrolyte imbalance. Minor symptoms are

- Nausea
- lethargy
- fluid retention
- Muscle aches twitches and weaknesses

If you have any of these look into your diet & supplement some sport's drinks. If it persists I think a visit to the general practitioner might be in order (the scenario of I do all the right things, but still have these symptoms on a continuous basis). In this case it might be electrolytes or other factors contributing to your symptoms.

More severe symptoms in which you should call 911 / consult a doctor immediately are:

- confusion or sudden change in behavior

- severe muscle weakness,
- rapid / irregular heartbeat,
- seizures
- chest pain

Depending on which electrolytes are out of balance the cure is usually an increase or decrease of fluid intake which provides electrolytes. Discuss this with your doctor.

Who is at risk for imbalance ?

Here is an overview of people who are at risk for imbalance:

- Elderly people
- Marathoners
- Crossfitters
- Anorexia and Bulimia patients

Elderly people have generally lesser fluids in their body and are therefore more prone for electrolyte imbalance. Marathoners and crossfitters exercise very intense for long periods of time at high stress. Therefore they should have a plan in place for replenishing electrolytes during competition. Anorexia and Bulimia patients are mainly at risk because they lose a lot of fluids through vomiting.

Why are electrolytes important for athletes ?

If you do not have your electrolytes in check you will not perform to your utmost best. This is due to your muscles and nervous system being impeded to perform through lack of electrolytes. If you want to outdo the competition, make sure that your body is well nourished and prepared for the battering. Electrolytes are an important part of this, especially when competition drags on for hours or days. Sprinters might see less need for electrolytes than endurance athletes due to the nature of their sport.

Conclusion

For you as a marathoner, crossfitter, lifter and sports enthusiast (which I assume if you read this blog) we can focus on the sports appliances of getting more electrolytes in your body and whether you supplement or not. Based on what I read I think it is advisable to have a sports drink ready for your intense workouts which make you sweat heavy. Take two to three sips when you rest between sets when weightlifting longer than half an hour. It is up to you whether you buy a ready made sports drink for that purpose or mix your own.

For endurance athletes, have a bottle with you especially for your long runs. I found that runs longer than 10 miles definitely need a water bottle with some extras in it. 3 - 10km runs depend on your fitness level. I dared to do those without any water bottle on me, as I can do these runs in 30 - 50 minutes. However if your fitness level lets you go over an hour for these distances, prepare yourself accordingly.

Supplements: Fish Oil



Supplements: Fish Oil

Fish Oil is a very prominent supplement which you can find in wholesale stores all over the world. While the list of acclaimed benefits is long, it is a very controversial supplement with many sources speaking for and against. Based on what I have found it has a most likely positive impact on heart disease and lowering triglycerides levels. I am not a doctor or specialist, so please consult one before supplementing fish oil (although I could call myself a nutritionist if I wanted, no degree needed for that). If you have any information which would help to make this article better, please say so in the comments and I will revise accordingly after checking.

What is fish oil ?

Fish oil is obtained from the skin of oily fish like [mackerel](#), [herring](#), [tuna](#), [salmon](#), [cod liver](#), [whale blubber](#), [seal blubber](#) and [shark liver](#) oil. Its main components to which its health benefits are attributed are the [fatty acids eicosapentaenoic acid \(EPA\)](#) & [docosahexaenoic acid \(DHA\)](#). EPA and DHA are [essential fatty acids](#). This means that the

body can not produce them on its own and therefore they have to be obtained via your diet. If you wanted plant-based sources of omega 3 you can [opt for edamame, walnuts, flax seeds, black beans, kidney beans and / or winter squash.](#)

The fish used to obtain omega 3 do actually not produce the fatty acids themselves, but obtain them by preying smaller fish who get them in turn from the microorganisms they eat in the sea. Therefore the fish with the highest concentrations of the wanted ingredients are those who heavily prey on other fish. As international waters [are getting more and more polluted with mercury](#) eating fish only to get your Omega 3 intake up can be dangerous. Therefore some sources recommend fish oil supplements and plant sources over fish if you were to actively bring your omega 3 levels up. This graphic taken from [Dr.Axe.com](#) might help you to get a clearer picture:



Controlling the balance of omega 3 and omega 6 in your body can be of interest as the modern has a tendency to have an excessive amount of omega 6 levels. This is [mainly due to consumption of processed and fried food that contains vegetable oils like soybean oil, canola oil, cottonseed oil and corn oil.](#) The ideal ratio is said to be around

1:1 to 4:1 while it tends to be 15.1/1 to 16.7/1 in modern western society. Influencing this ratio in a positive way is said to have multiple health benefits which are related to the functions of these two essential fatty acids in the body.

The two acids are modified in the body to take part in processes linked to fighting inflammation, influencing mood & behaviour and take part in cellular signalling and acting on DNA.

If you want to supplement fish oil it comes in many forms like capsules, liquids, tablets and powders. Most commonly you will see fish oil in capsule form. Common brand names are:

- *Animi-3*
- *Cardio Omega Benefits*
- *Divista*
- *Dry Eye Omega Benefits*
- *EPA Fish Oil*
- *Fish Oil*
- *Fish Oil Ultra*
- *Flex Omega Benefits*
- *Icar Prenatal Essential Omega-3*
- *Lovaza*
- *Marine Lipid Concentrate*
- *MaxEPA*
- *MaxiTears Dry Eye Formula*
- *MaxiVision Omega-3 Formula*
- *Mi-Omega NF*
- *Mom's Omega Advantage*
- *Omega Essentials*
- *Sea-Omega*
- *Sea-Omega 30*
- *TheraTears Nutrition*
- *TherOmega*
- *Vascazen*

Here are some examples of packaging and marketing of different forms of fish oil:



Gummies with different flavors, as untreated fish oil can be quite unpleasant.



Marketing for children, as fish oil has supposed benefits for children suffering from ADHD according to the university of Australia.



Fish Oil capsules are probably the most common form of fish oil being sold today. If you use the capsules **do not puncture or open them**.

If you want to dig deeper into different products there is a good overview of fish oil supplements at [labdoor](https://www.labdoor.com). Two of the main findings were that, as so often with dietary supplements, the labelling was inaccurate. Total omega-3 content ranged from -60.0% to +62.5% versus their stated label claims. In addition, this research found that the

capsules have a higher concentration of the wanted ingredient than their chewable and liquid alternatives.

What are the benefits of fish oil ?

The [list of claimed benefits for fish oil is very long](#). Here a taste of it:

- Prevents heart disease
- Prevents stroke
- Lowers blood pressure & cholesterol levels
- Helps with depression, bipolar disorder, psychosis attention deficit-hyperactivity disorder (ADHD), [Alzheimer's disease](#), developmental coordination disorder, [migraine headache](#), epilepsy, schizophrenia, post-traumatic stress disorder, and mental impairment.
- Helps with clogged arteries, chest pain, [irregular heartbeat](#), bypass surgery, heart failure, rapid heartbeat, preventing blood clots, and [high blood pressure](#) after a [heart transplant](#).
- used for diabetes, prediabetes, asthma, a movement and coordination disorder called dyspraxia, dyslexia, eczema, autism, obesity, weak bones (osteoporosis), [rheumatoid arthritis](#) (RA), [osteoarthritis](#), psoriasis, an [autoimmune disease](#) called systemic lupus erythematosus (SLE), [multiple sclerosis](#), HIV/AIDS, [cystic fibrosis](#), gum disease, Lyme disease, [sickle cell disease](#), and preventing weight loss caused by some cancer drugs.

My personal favorite is a graphic that I found on Dr.Axe.com which claims "glowing skin" as a benefit of taking fish oil

10 FISH OIL BENEFITS

- 1 Reduces Inflammation
- 2 Cancer Prevention
- 3 Reduces Alzheimer's Risk
- 4 Improved Joint Pain
- 5 Lifts Depression
- 6 Gut Health
- 7 Improved ADHD
- 8 Thickens Hair
- 9 Glowing Skin
- 10 Heart Health

Dr. Axe
FOOD IS MEDICINE

I mean do I turn into a glow worm by taking fish oil ? Maybe i can light the way for captain Ahab to find moby dick after taking this super supplement, stay underwater for two hours and kill the sperm whale myself while I am at it. Then I will drink its blubber to rinse and repeat the process. Bodybuilding.com takes a similar approach, overselling the benefits of fish oils with statements like:

"Regardless of who you are, it's almost certain you will benefit from it"

"There are few supplements on the market that offer as many benefits as fish oil does"

"It would be a very smart move to start paying attention to your fish-oil consumption for bone health."

Watch out for claims like this which suggest to you that you would be stupid not to take fish oil and that everyone und any circumstances would benefit. Usually, it is a lot more complicated than that.

Supported health claims by the U.S. Food and Drug Administration are for coronary heart disease and to lower levels of triglycerides. A high level of triglycerides can increase your risk of heart disease just as cholesterol can. The longer fish oil is under the scrutiny of the public eye, the more the big claims to not seem to hold in structured trials. So to get benefits for these two scenarios you would have high levels triglycerides or coronary heart disease for which, I do hope, you are seeing a doctor and he/she will most probably already have talked about fish oil with you.

There is more evidence surfacing, that the claimed health benefits for do not hold which you can find [here](#), [here](#) and [here](#). The [Durham Trials discussed in Ben Goldacre's book Bad Science](#), in which it was suggested that fish oil would enhance the intelligence of children, also showed no improvement. Ben Goldacre goes on to point out that government spent 80p for pills a day for the 5.000 students in question while only spending 65p on their daily meals in the canteen. I think starting with diet rather than supplements is a valid point.

What are the risks of fish oil ?

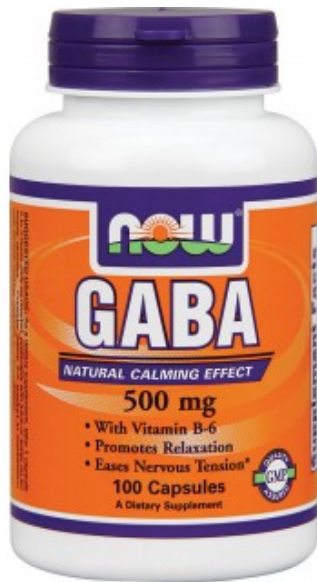
The usual risk groups are:

- Pregnant women
- Elderly
- People who already take medicine
- People with diabetes;liver disease;a pancreas disorder;underactive thyroid;if you drink more than 2 alcoholic beverages per day
- People with fish allergy or soybean allergy

Some interesting statements are [that fish oil tablets should not be administered to children](#), while we have the Durham Trials going on and products actively marketed to being put in front of children. For the following medication, fish oil can [lower their impact](#)

- estrogens (birth control pills or hormone replacement);
- a blood thinner such as warfarin (Coumadin, Jantoven);
- a beta-blocker such as atenolol (Tenormin, Tenoretic), carvedilol (Coreg), labetalol (Normodyne, Trandate), metoprolol (Dutoprol, Lopressor, Toprol), nadolol (Corgard), propranolol (Inderal, InnoPran), sotalol (Betapace), and others; or
- a diuretic (water pill) such as chlorothiazide (Diuril), hydrochlorothiazide (HydroDIURIL, Microzide), chlorthalidone (Hygroton, Thalitone), indapamide (Lozol), metolazone (Mykrox, Zaroxolyn), and others.

Supplements: GABA



Supplements: GABA

Please always consult a doctor before taking any supplements. Supplements are no replacement for a well-balanced diet. In this article, I look at information about Gaba from various internet sources. I am not a doctor or nutritionist and just help you to save time by consolidating what I read. Please follow the links to make up your own mind. In total GABA seems to be a suboptimal supplement for the purposes of strength training compared to other options like protein supplements.

What is GABA ?

GABA is the abbreviation for [Gamma Amino Butyric Acid](#). Based on its molecular structure it is an amino acid but does not take part in the building of [proteins](#). GABA is built by a [metabolism of glutamate and vitamin B6](#) in the body and is said to be [one of the most important and widespread inhibitory neurotransmitters in the body](#). There are estimates that up to [40% of the synapses in the human brain work with GABA](#).

Glutamate and Gaba help your nervous system to regulate impulses in the brain and to the rest of your body. While glutamate promotes activity, Gaba inhibits it. Therefore,

drugs who regulate GABA levels and bring them up either directly or by changing your metabolism in favor of GABA being promoted in the body [have relaxing, anti-anxiety and anti-convulsive effects](#). Examples would be [alcohol, cannabis, and tranquilizers](#) which promote that effect. GABA is said to be a help for patients with anxiety issues, depression and other diseases of a similar kind. GABA is also said to [provide a positive effect on the production of human growth hormones and as a result gained popularity as an orally taken nutritional supplement amongst bodybuilders and strength athletes](#). A lack of GABA can lead to over functioning of the nervous system. [Results can be:](#)

- Anxiety disorders
- Panic attacks,
- Addiction,
- Headaches
- Parkinson's syndrome

Depending on the source it is promoted and sold as a

- Sleeping pill
- Weight loss pill
- Strength pill
- Tranquiliser
- Reducing symptoms of PMS
- Stabilising blood pressure
- Improving exercise tolerance
- Treatment for ADHD

[As it is considered to be GRAS \(generally considered safe by the FDA\)](#) it is sold over the counter. Depending on the source the recommended daily intake is between [250mg - 750mg to 2g - 5g a day](#). These are usually provided in capsules or powder form.

Does GABA work ?

[GABA itself can not cross the brain blood barrier](#). The blood-brain barrier is a semipermeable membrane which prevents certain minerals / nutrients etc. to get from the blood into the brain. As this is the case GABA is often referred to as a placebo in medical circles for relieving anxiety if taken orally in its pure form.

There is a prodrug version in which Niacin has been combined with Gaba to make it possible to cross the brain blood barrier. However, there are little studies done on this version while the effect of GABA as an inhibitor of activity in the brain seems to have been well studied and proven. So adjusting GABA levels in the brain to get the desired

effects does work, but taking it orally seems to have little to no influence on the GABA levels in the brain. Better alternatives which need lower dosages to promote the same effect regarding anxiety seem to be:

- 5-HTP
- Tryptophan
- Valerian herb
- Kava herb
- Passion-flower

As this blog is most centered around getting fitter, you are most likely interested in the effects of GABA on muscle & strength gains. There are very little studies being conducted on this topic. Wherever GABA does seem to have an influence, based on what I read, the dosage has to be pretty high (3g -5g). immediately before exercise and exercise has to be hard. As in addition, a higher level of GABA makes you more docile rather than pumping with adrenaline it seems not to be a very good choice for the purpose of strength training. Adrenaline, dopamine, serotonin & glutamate seem to be a better fit for this purpose. These substances are harder to come by over the counter than GABA though.

As for dosage and side effects I leave you with a description of Carl Pfeiffer taken from his the book the healing nutrients:

"About ten minutes after taking the GABA, I started to wheeze and my breath rate increased to 45 a minute. Five minutes later, my heart rate peaked at 140 and my blood pressure at 180/100. I was choking, fidgeting and could not sit still. I had a massive anxiety attack, thinking I was going to die.....I vomited into the waste basket. Over the next half hour, this anxiety attack let up, but I continued to be nauseous for the next two hours.

"This dose of GABA also caused a constant flush sensation, like that of niacin, although my skin was not red. I had a tingling in my hands and over my entire body. This effect occurred even at the lesser dose of 3 g of GABA and is likely neuralgic, unlike the effect of niacin which is primarily vascular."

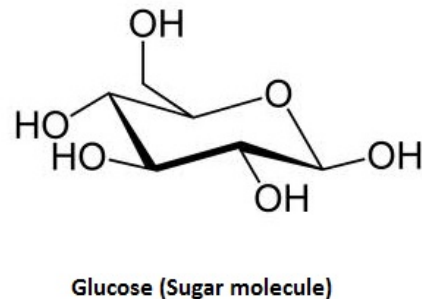
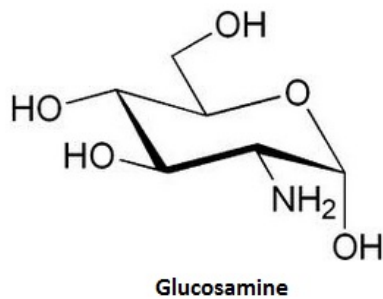
How much does Gaba cost ?

Depending on where you source it and in which form you get it prices vary between 7.95 USD to 30 USD. Most of the material is labelled and promoted for anxiety relief or to calm you down. There is less advertisement for muscle gains and fat loss.

Conclusion

All in all in my personal opinion based on what I have read GABA seems to be not an ideal choice for muscle and strength gains. Most research is being done on its effects on anxiety relief for calming people down. Oral intake also seems to have little to no effect based on the chemical structure of GABA, unless you get into ranges for the dosage gets you some funny feelings, based on Pfeiffer's description. It just does not make sense in my world to use a product that is mainly related to functions to calm someone down to promote body fat loss and muscle gains. I find it easier and more straight forward to make this connection for adrenaline if you are already going down that path. The final nail in the coffin for GABA is that it is an amino acid which is **not** taking part in the protein metabolism. I think that says it all for its real value for bodybuilders, but never underestimate the real effects that placebos can have on your mind and body.

Supplements: Glucosamine



Supplements Glucosamine

Glucosamine is a fairly popular dietary supplement which is marketed to athletes for preventing joint injury and helping to recover quicker for them. Looking up some data and reference points this seems to be a non-reproducible claim in bigger studies. I am personally not a doctor or statistician, so please do your own research, double check and consult a doctor before supplementing Glucosamine and come to your own personal opinion. I hope this write-up helps you down this path for a quick start. If you find any information, have comments or are a professional who stand to correct me, please leave a comment which will be reviewed, replied to and incorporated in the article to improve it.

What is Glucosamine ?

Glucosamine is one of the [most abundant monosaccharides](#) on the planet. It is an amino sugar which can be found in the cell walls of fungi. It was [first prepared in 1886](#) by [Georg Ledderhose](#). For the purpose of this article, we will look at Glucosamine in its use as a [dietary supplement](#).

The monosaccharide is mainly derived from [shrimp, lobster, crab](#) and other shellfish and ground in industrial processes to end up as a supplement on the shelves of your local stores. It can be obtained as capsule, tablet, liquid or powder. There are also

options which are free from shellfish in case you are allergic. Depending on the target group it comes in many packages and with a multitude of claims. These claims are mainly around easing joint pain or fastening up recovery in sports. In some instances, these products have additional ingredients like chondroitin sulfate, MSM, or shark cartilage chondroitin sulfate, MSM, or shark cartilage.

When you find Glucosamine it usually comes in one of three variations:

- Glucosamine sulfate
- Glucosamine hydrochloride
- N-acetylglucosamine

Most scientific research has been done on Glucosamine sulfate. Any statements which will follow therefore correlate most with the effects of Glucosamine sulfate.

What are the benefits of Glucosamine ?

Glucosamine products claim to have benefits for relieving joint pain and especially osteoarthritis. You will, for example, find them in your local hollands and barrets or boots showing a sore knee or elbow and that taking the product will get rid of the pain.

While these are the claims by the ones who market the product it seems to be hard to establish prove in long-term studies that glucosamine is any better than placebo. As the evidence is mixed the natural medicines comprehensive database rates glucosamine is likely effective to relief pain from Osteoarthritis. There is evidence, however, that Glucosamine has no effect in feeling less pain for osteoarthritis in the knee, the one effect I would be most interested in as a runner which would render it useless for this target group.

What are the risks of Glucosamine ?

Glucosamine is stated to be generally safe at doses of 1500mg a day. If mild side effects occur they are usually described as:

- Upset stomach
- heartburn
- drowsiness
- headache

Also if you have one of the following conditions please always consult a doctor before taking Glucosamine as a dietary supplement:

- shellfish allergies
- diabetes
- kidney disease
- heart disease
- bleeding disorders
- high blood pressure

There are [proven severe interactions with warfarin](#). Warfarin is an [anticoagulant](#) normally used in the [prevention](#) of [thrombosis](#) and [thromboembolism](#), the formation of blood clots in the blood vessels and their migration elsewhere in the body.

In all fairness to Glucosamine, if you have one of these conditions, most of the times you have to check back for any kind of pill that you take with your doctor as you are in a higher risk group and probably on heavy medication to treat your current symptoms already. Usually, shellfish allergies relate to the flesh of the animals rather than the shell, which glucosamine is made of, however, there might be residue from the production progress that could lead to an allergic reaction. So to be sure if you are allergic, take one of the options which have not been made from shellfish.

There was also evidence that [doses of 3000mg of glucosamine could lead to diabetes which has been shown in rodents](#). On both, the shellfish allergies and heightened risk of diabetes, an [irish times report claimed that these were not sustainable](#). To be on the safe side opt for non shellfish Glucosamine and stay around 1500mg a day which has been found to be generally safe in bigger, well structured trials (well structured meaning there were control groups in place & bigger, randomised samples).

What is your personal experience of Glucosamine ?

I took Glucosamine when I had bursitis in my elbow from too much bench pressing. The injury was not painful to begin with which led to me postponing the visit to the doctor until I had a tennis ball sized lump sticking out of my arm. That was in February 2015 and I took Glucosamine as I thought it would help me to recover quicker. I can not possibly say whether it had a positive effect. I stopped training entirely for that month and I think that was the greatest help for my recovery, rather than taking two pills of Glucosamine daily, based on what I have learned now.

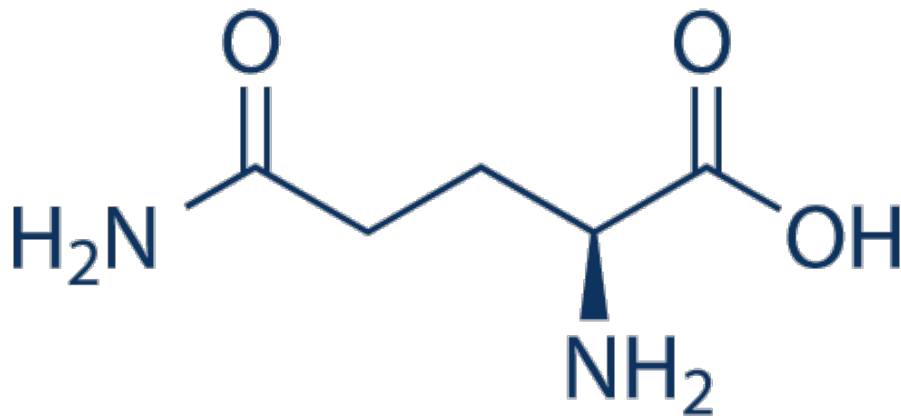
What are the costs of Glucosamine ?

Glucosamine comes in many colours, forms and concentrations. You will usually pay between 5 to 50 bucks depending on what and how much you get.

Conclusion

All in all, Glucosamine seems to be generally not that effective for what is claimed by the dietary industry. There are cases [where companies are paying up for their false claims in the states](#). There are also voices that [the concentration of 1500mg a day to rebuild tissue in the joints is 10 - 100 fold too low](#) to have an effect. If you have a shellfish allergy or any other condition mentioned above be cautious and check for the labels and dependencies with your current medication. The purpose of rebuilding tissue and avoiding joint injury in sports can be achieved without dietary supplements by having a proper training plan, lifestyle choices and taking recovery measures like going to the sauna and proper stretching before and after working out. Please do not tread osteoarthritis with glucosamine, as this is a serious, chronic condition for which you should consult a doctor and take prescribed medicine which is monitored professionally.

Supplements: Glutamine



Supplements: Glutamine

Glutamine is quite popular amongst bodybuilders and readily available from most online stores for purchase. All in all, it seems to help prevent destruction of muscle tissue rather than being actively anabolic when I personally looked over the studies. I am not doctor or specialist. Please consult an expert before supplementing anything. Here is my write-up about Glutamine looking at the conservative and positive side.

Facts & Figures

Glutamine is one of the 20 [proteinogenic amino acids](#) which are in the standard genetic code. These split into groups of [essential and non-essential amino acids](#). These two groups derive from whether they can be synthesized by the body or not. Glutamine falls into the group of non-essential amino acids as your body produces it and you do not have to provide it via your diet.

19% of Glutamine is made of nitrogen and it is used in [protein synthesis](#) and [lipid synthesis](#). Roughly 61% of your skeletal muscle is made from glutamine and therefore 90% of the overall production of it takes place in the same area of the body. While the liver takes a regulating role bringing down surplus glutamine produced by the gut and intestines, the brain and lungs also contribute to the production at a significantly lower level than the [skeletal muscle](#).

Glutamine is used for many anabolic processes as a donor of nitrogen due to its high concentration of it on a molecular level and as a donor of carbon for the [citric acid cycle](#). If you have not majored in medicine the nitrogen in Glutamine is mainly used in the building of muscle while the carbon helps you digest food.

Furthermore, its function is as a transporter of ammonia in the blood circulation. [Whether it is toxic or not is being debated as it was assumed for a longer time to be not toxic, but there are studies which say otherwise.](#)

Glutamine supplementation has shown to have a positive effect in patients with [muscle waste](#), [ulcers](#), and [cancer](#) as treatment, if dosed right depending on the glutamine depletion caused by these diseases (of course the trick is to find the right balance per patient).

Glutamine itself can be found in beef, pork, chicken, fish, eggs, milk, dairy products, wheat, cabbage, beets, beans, spinach, and [parsley](#). It is also highly concentrated in whey and casein supplements. There is also a wide range of L-glutamine powders available for purchase, especially for bodybuilding purposes.

If you are supplementing it and want to see effects most sources that I could find agree that you should take about ten to fifteen grams a day distributed in three servings. One in the morning, one after activity and the last one in the evening.

Benefits & Risks

Depending on the source you will find a wide-ranging claim of benefits provided by the supplementation to name a few:

- 400% more growth hormones in the body when supplementing L-glutamine
- Improves gastrointestinal activity(1)
- Helps heal ulcers and leaky gut (2)
- Is an essential neurotransmitter in the brain and helps with memory, focus, and concentration (3)
- Improves IBS and diarrhea by balancing mucus production (4)

- Promotes muscle growth and decreases muscle wasting (5)
- Improves athletic performance and recovery from endurance exercise (6)
- Improves metabolism and cellular detoxification (7)
- Curbs cravings for sugar and alcohol (8)
- Fights cancer (9)
- Improves diabetes and blood sugar (10)

When you do your own research I would personally recommend that you take a close look at who is writing the content. Anyone who is a physiotherapist, nutritionist and in the bodybuilding / strength industry will most likely have an agenda to push glutamine as a product for you to purchase. Therefore, the content will be written in a way that blows the benefits out of proportion. That does not necessarily mean, that the claims are completely wrong, just slightly misrepresented to increase sales.

On the other end of the scale, we have doctors, governments, and other official institutions. For them, the risk is considerably higher if they publicize wrong statements, therefore, these sources usually come in from the very cautious side.

The truth mostly lays somewhere in the middle when you connect the dots. Read several articles from both ends of the spectrum to get the gist of it.

On the risk side for glutamine, the most striking input that it might function as a contributor to brain tumors. I do not understand the complete ins and outs of it, but you will find material outlining that there is a possibility of having a higher risk of a brain tumor occurring if you use Glutamine. These studies are not conclusive yet, still I think this is worth mentioning.

Glutamine products

Glutamine can be bought as capsules, powder and part of a mix with [creatine and protein](#) components depending on the vendor and the training goal. As with every other supplement, they come in various packages, forms, concentrations and price ranges. A pure glutamine supplement should come in between 15€ to 20€ euro for 300g to 500g. A blended product with other components usually comes in a tub of 2.5kg and sets you back somewhere between 30€ to 60€.

Conclusion

Based on what I have read in the various medical reports and on supplementation sites that there is slim to no evidence that glutamine actively lets muscles grow. The benefit that I found most repeated was that it somehow helps to prevent the deconstruction of muscle tissue. This is helpful if you are training very extensive with high repetitions to

avoid tissue breakdown, but seems to have no anabolic effect in itself. The risk you take for this is a not proven, but hinted at, possibility to have a higher risk of a brain tumor. Now there is always a study out there that eating too much of something leaves free radicals in your body and therefore you run a higher [risk of cancer](#) because of it, so that does not bother me too much.

I like the medical approach to this which states that you should not medicate if there is a need to. the same approach should be taken for supplements. If you can reach your goals (which you can) without taking supplements, there is no need to take them and spent your hard earned money on them.

Supplements: Multi Vitamin / Mineral



Supplements: Multi-Vitamin / Mineral

Please consult a doctor before taking any supplements! Now that that is out of the way here is an overview of how the benefits of multivitamins for generally healthy individuals are negligible and that especially Scandinavians seem to produce evidence that supports that these pills promote cancer. This is all of what comes in a nutshell but see for yourself ;).

What are multivitamins ?

Multivitamins are dietary supplements which contain macronutrients like vitamins and dietary minerals. They are recognized by the [Codex Alimentarius Commission](#) as food. There is no commonly accepted definition in markets or from scientists and the term [can apply to a wide variety of products](#). This is a reason [why pills with the same ingredients can be found as in antioxidants or multivitamins on the shelves](#). Therefore the ingredients of multivitamins vary greatly based on marketing strategies and local preferences. The [first multivitamins in the states were available in 1940](#).

In the United States, a dietary supplement is [considered to be a multivitamin when it contains 3 or more vitamins and minerals](#) without containing any herbs, hormones or drugs. Usual multivitamin formulas contain:

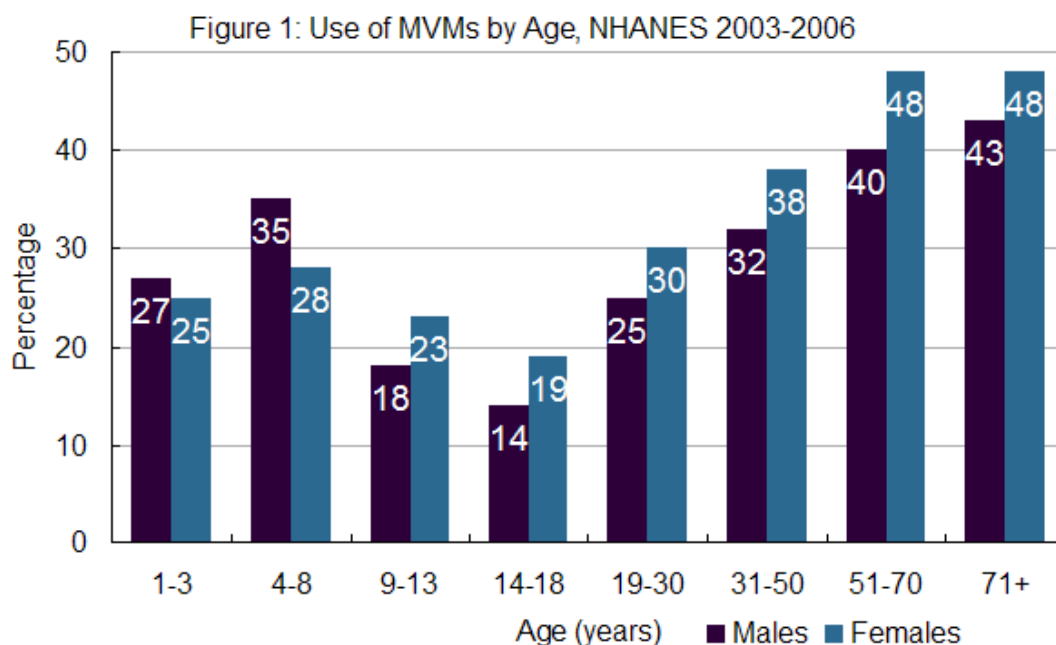
- Vitamin C
- B1
- B2
- B3
- B5
- B6
- B9
- B12
- Biotin
- A
- E
- D2 (or D3)
- K
- Potassium
- Iodine
- Selenium
- Borate
- Zinc
- Calcium
- Magnesium
- Manganese
- Molybdenum
- Betacarotene
- Iron

and come as tablets, capsules, pastilles, powders, liquids, and injectable formulations (only per prescription). For men there is usually less iron in the multivitamins, as this group usually already has enough in their system naturally, [while for 50+ the vitamin D](#)

doses might be increased as in this age group absorption of nutrients like calcium, vitamins b6 and 12 seems to slow down.

As age groups and gender, specific pills are available, which could also be called special formulas, you will also find cocktails which will give 100% to 1000% of the recommended daily intake of the certain macronutrients. So-called "high-potency-formulas" or "overdose multivitamins" are usually paired with extreme health or sports benefit claims. Some nutrients, mainly calcium and magnesium, are usually not included in MVMs as this would make the pill too large.

In the 1999–2000 [National Health and Nutrition Examination Survey](#), 52% of adults in the United States reported taking at least one dietary supplement in the last month and 35% reported regular use of multivitamin-multimineral supplements. That the use of multivitamins is further underpinned by the graphic shown below which shows the trends from 2003 through 2006:



Theoretically, multivitamins are the best option for lower income parts of the population to get all of the nutrients they need which they can not afford to consume via a more balanced natural diet. Practically, though, according to this study in the time period from 2003 to 2006 use is more frequent among women and the children of women who use supplements; the elderly; those with more education, higher incomes, healthier lifestyles and diets, and lower body-mass indexes; and residents of the western United States. So if you are living in L.A., have a university degree, work in the movie industry & exercise regularly it is very much more likely that your children will also use supplements and that your household will make the pill manufacturers happy.

You can obtain multivitamins online, in local shops and basically anywhere where you would do your normal shopping. Price ranges differ from 5 USD / Euros to 50 USD / Euros. Here you find a selection of different products as an overview.

Products available from Holland's and Barrets:

- [Radiance Multi Vitamins & Iron Ore](#)
- [ABC Plus Senior Capsules](#)
- [Healthy Kids Multivitamins plus Omega 3](#)
- [Radiance Multi Vitamins & Minerals](#)
- [Vegan Multivitamin and Mineral Tablets](#)
- [Vitabiotics Wellkid Tablets](#)
- [Ultra Man Caplets](#)
- [Nature's Way Alive! Children's Soft Jell 60 Tablets](#)

From [bodybuilding.com](#):

- [Jym Vita Jym 60 Tablets](#)
- [MuscleTech Platinum Multivitamin, 90 Caplets](#)
- [EVLUTION NUTRITION VitaMode](#)
- [Opti-Men](#)
- [Universal Nutrition Animal Pak](#)
- [Controlled Labs Orange Triad](#)
- [Opti-Women](#)
- [GAT Mens Multi+ Test](#)

And there is also a further article @ [Muscle & Fitness magazine](#) discussing several multivitamin options.

What are the benefits of multivitamins ?

All in all, it seems that you only benefit von multivitamins significantly when either your diet is not very balanced or when you are old. [Specific groups would be the very young and the very old, or very sick people who eat an extremely limited diet.](#) Cases in which MVM supplementation can be potentially of advantage:

- Supplementation with calcium and vitamin D [might increase bone mineral density and decrease fracture rates in postmenopausal women](#)
- [People over age 50 should obtain recommended intakes of vitamin B12 mainly from fortified foods or dietary supplements](#) because they could be less able than younger people to absorb the protein-bound, naturally occurring vitamin B12 in food

- [Pregnant women should see benefits from supplementing iron](#)
- Vegans can supplement easier based on their dietary needs
- If you have problems eating, supplementing might be beneficial after seeing a doctor
- A 450.000 people analysis [found no clear evidence that multivitamins prevent cancer or heart disease](#)
- [Some studies with high variability so that some certain individuals do benefit while others do not](#)

IN summary, it seems like that benefits for generally healthy individuals who eat a healthy diet are slim to none. The dynamic changes for special subgroups like the elderly, people with special diets or pregnant women. As this usually should go with being observed by a doctor go with the prescriptions you will get.

What are the risks of multivitamins ?

This is a mixed bag. Some, it seems especially European, studies claim that multivitamins can increase the risk of cancer and mortality.

- [A prospective study of Swedish women found an association between MVM use and an increased breast cancer risk](#)
- [A study in which postmenopausal women in Iowa were followed for 18 years found that those taking MVMs had a slight but significant increased total mortality risk as compared to nonusers](#)

Other big studies that went for years and seem to adhere to best practices for testing (read Ben Goldacre's books to understand this better) seem to find [no significant positive or negative effect by MVMs](#).

The main risks are overdosing on multivitamins when taken too often or taking the pills as a supplement for a healthy diet... The side effects can be many depending on individuals for being either undernourished or having too high levels of certain vitamins.

How good is the quality of the products ?

[Labdoor tested 68 multivitamins across 1.072 assays based on their labeling in correspondence with recommended daily intake](#). They also analyze if there are any harmful substances in the products which should not be in it and/or are not stated on the label. The outcomes were as followed:

- Labelling was incorrect with a range from -11.330 to +3000 (see website for details what this means)
- Gummy and Chewable multivitamins had on average 52.8% less vitamin and 77.3% lesser minerals
- Generally little sugar in the products

Here is the top ten of multivitamins based on this analyses:

- Garden of Life Vitamin Code for men
- Garden of Life Vitamin code perfect weight
- Nature's way alive max potency multivitamin
- Rainbow light men's one
- Garden of life vitamin code for women
- NOW Foods adam men's multivitamin
- NOW Food's Eve Women's Multivitamin
- GNC Mega Men
- Carlson Labs super 2 daily
- Rainbow light Women's One

What is your experience with Multivitamins ?

I have used the solvable tablets which you can get at Lidl in Ireland and [MYPROTEIN Alpha men](#). I mainly use them to make my water a bit more interesting. As I am eating generally healthy (at least I'd like to think so) and do not monitor my intake I can not say whether it is beneficial or harmful to take them or not. Here you can also see the dilemma of individual experiences vs big data analyses in randomized trials. There is little chance that I will personally pinpoint any positive or negative impacts of the multivitamin intervention in my diet apart from placebo effects. This is due to too many factors coming into play and too little data points to balance out.

So I have not dropped dead yet because of them, but also did not turn into the hulk.

Conclusions

Based on what I looked at generally supplementing multivitamins seems only to make sense for certain subgroups of the population like the elderly, sick and people on a special diet. Even then the benefits seem to be minimal rather than breathtaking, which becomes a more common observation the more I look into different types of supplements. The risks seem to be minimal and inconclusive for now based on what study you look at. Again the final conclusion is: Pay attention to a healthy diet with good ingredients and you won't need to supplement unless you get sick and need to

Supplements: Probiotics



Supplements: Probiotics

Probiotics are being marketed as helping you with the balance of your gut flora. While this holds true in some trials, especially when there are minor problems with diarrhea already, generally the authorities do not accept health claims for probiotics due to lack of evidence. It seems to work for my fiancée, though, and the placebo effect should never be underestimated!

What are probiotics ?

Probiotics are bacteria and yeast which are claimed by some institutions and authorities to have benefits for your body, especially for your digestive system, They consist of billions of bacteria in your digestive system which are making up to 1 kilogram of your overall bodyweight. In the gut flora there are around 400 different bacteria, some of them beneficial to your health, some of them harmful. The world health organisation defines probiotics as

"Live microorganisms which, when administered in adequate amounts, confer a health benefit on the host"

Probiotics were first discussed in a background of a healthy gut and lifestyle when [Elie Metchnikoff](#), 1908 Nobel Prize Winner, observed Bulgarians who drank sour milk and he made a connection between the bacteria in the sour milk and their healthy living. Since then probiotics have become a billion dollar business developing from a market of US\$23.1 billion to US\$31.3 globally in the years from 2010 to 2014.

The live organisms in probiotic products are mostly bacteria. The produce on the shelves at your local store or pharmacist usually contain [Lactobacillus](#) or [Bifidobacterium](#). Other options can be [Streptococcus](#), [Enterococcus](#), [Pediococcus](#), and [Lactococcus](#). A live organism has to pass all of the acids in your stomach alive. This is one of the reasons apart from overselling why the labels of probiotic products seem to be very unreliable as the manufacturers state the concentration directly after production, while bacteria can die during shelf life and still have to be concentrated enough to have the impact when you consume while having to pass through your body.

If you come across products stating that they have prebiotic, probiotic and synbiotic ingredients the main component helping you are still the probiotics. Prebiotics are non-digestible organisms which are utilised as food for the probiotics so that they stay alive for longer. A mix of the two is named synbiotic.

The [European Food Safety Authority](#) has [rejected all petitions by commercial manufacturers for health claims on probiotic products](#) in Europe due to insufficient research and thus inconclusive proof of effectiveness.

[In the United States, probiotic manufacturers have received warning letters of impending legal actions for using exaggerated claims](#) of health benefits not supported by clinical evidence of efficacy.

What are the benefits of probiotics ?

Claimed benefits of probiotics are:

- Treat diarrhea, especially following treatment with certain antibiotics
- Prevent and treat vaginal yeast infections and urinary tract infections
- Treat irritable bowel syndrome
- Speed treatment of certain intestinal infections
- Prevent or reduce the severity of colds and flu

Depending on the source the benefits get more overstated and wider or more moderated. If the source is mentioning or selling any products it is usually leaning towards overselling the benefits while the more clinical sources get, the more they are sceptical. Government bodies even flat down deny the validity of health claims for probiotics. Here an example on how probiotic products are being advertised:



Which completely clashes with the statements of the EU (scientifically proven??). All in all, the most benefits seem to occur, if there are any, for people who already have mild bowel irritations of some kind. For the cases for which [there is evidence of benefits in studies the doses for the microorganisms to have an effect is between 1 billion to 15 billion CFU](#). CFU stands for [colony forming unit](#) and is a measurement to determine how many bacteria are in one mg of fluid or one gram of solid.

What are the risks of probiotics ?

They are in general deemed to be [safe for healthy](#) adults based on what I read there are only concerns in some cases. Pregnant women, children, and individuals with badly affected digestive systems from disease should stay away.

What is an imbalance of the microbiota in the

digestive system ?

This was the biggest question for me while sifting through the material at hand, admittedly mainly internet sources. You will find a lot of material on that you should take care of your gut flora and that it can be easily disturbed (and fixed with pürobiotics for that matter), but i did not find specifics for what a healthy or unhealthy gut flora is. This is quite nerve wrecking when you want to determine what to take in and in which amounts. So just pause here and think about this whole probiotic thing.

How much do probiotics cost ?

In the range of 2 - 50 US\$. [Labdoor](#) did a more extensive study on a couple of available probiotic products in the US which found that the labels are inaccurate and that there are some health benefits for over 5000 million cfu.

Conclusion

Looking at everything, i personally think that what I have read points towards that probiotics are not as effective as they made out to be. It makes sense to me that if you take antibiotics the bacteria in your gut flora get a knock and taking new ones orally can help you to get better / recover quicker. In the context of strength training and marathon running, I think it can be helpful if you experience problems with your digestive system during training on a regular basis. If that is the case try probiotics to make you feel better and therefore perform better after consulting a doctor.

Supplements: Protein



Supplements: Protein

Main benefits of proteins are that they help as enzymes in the body to catalyze chemical reactions. In the context of sports nutrition, this yields the promise of more muscles faster and quicker recovery from injury. While the popularity of protein supplements is on the rise, critics are not tired pointing out that same can be achieved by natural means and the risk for supposed negative effects on kidney and liver are too high. I am not a doctor or dietician so please consult your expert of choice if you want to supplement, but here is my write up of what I was able to gather and the experiences I had with protein powder.

What are proteins ?

Proteins are large biomolecules which consist of chains of amino acids which are stuck together by peptides. They are involved in DNA replication, responding to stimuli, transporting molecules and catalysing metabolic reactions. Some of the catalyzing effects of proteins are quite staggering. In the case of orotate decarboxylase, a [protein shortens the reaction time from 78 million years to 18 milliseconds](#). This is achieved by the protein's main characteristic to bind molecules with their binding site. This is often a depression or "pocket" in the molecular surface. Proteins, therefore, come in many shapes and forms as they fit in three dimensions to allow for these depressions to form.

Proteins can exist for minutes or years with an average lifespan of 1-2 days in mammalian cells. Once they have fulfilled their purpose they are degraded through the process of protein turnover. Bacteria cells contain about 2 million proteins per cell, yeast cells about 50 million and [human cells in the range of 1 to 3 billion](#). The most common role of proteins is, as mentioned, the form of an enzyme to catalyse chemical reactions.

In terms of bodybuilding and strength development actin and myosin play a special role in the mechanical function of the body and muscle growth as they are one of the building blocks for skeletal muscle.

Protein as a dietary supplement

Protein has a great popularity among athletes and sports enthusiasts of all walks of life to support their performance. While it started as a [bodybuilding supplement](#) and it is now getting more and more into the mainstream and more commonly available. This can be seen that sports stores like Elvery's have now protein powder stocked or milk producers like Avonmore are actively marketing protein milk to sporty target groups.

The forms in which protein as a supplement comes are many. You can get as powder, in a bar, pre-packaged milkshakes, and other formats. The protein is [usually derived from](#)

- Whey
- Soy
- Casein
- Egg
- Hemp
- Rice
- Peas

Whey protein [is considered a complete protein containing all of the essential nine amino acids](#) (tryptophan, threonine, isoleucine, leucine, lysine, [Methionine+Cystine](#),

[Phenylalanine+Tyrosine, Valine, Histidine](#)). It is a byproduct of the process of turning milk into cheese. Two of the [biggest producers of whey are Glanbia in Ireland and Hilmar in California](#). Based on which product you are looking at whey concentrate has 29% to 89% protein by weight whereas whey isolate is usually in the 90%+ area. Usually, the higher the quality of the product the higher the concentration, given that the manufacturer did not mislabel. Whey is quicker digested than the other forms of protein and within the forms of whey, the hydrolysate whey is the one that is digested the quickest. [This helps bodybuilders and strength athletes in muscle recovery](#). Casein is another form of protein which usually takes longer to digest and is therefore taken before going to bed. If you want to [check the quality of your protein without sending it to a lab divide the grams of protein per scoop by the size of the serving](#). The higher the percentage rate the better.

[Soy protein, Rice protein, Pea protein & Hemp protein](#) are options for vegetarians who want to supplement protein in their diet. While soy protein can have the risk of an allergic reaction, if you are allergic, combinations of pea and rice protein can be used as an alternative. Hemp protein is derived from hemp seed and has the benefit of also providing essential fatty acids (which bodybuilders usually get from fish oil). These forms of protein have most likely to be bought online in a specialist online shop and are rare to be found in wholesale.

IN the UK one of the leading brands is [MYPROTEIN](#). There top ten sellers listed below:

- [Power Tower](#)
- [Muscle and fitness you will find one of the longer pieces on protein](#) on [protein](#) which provides you with list of recommended merchandise:
 - Nytro Whey Ultra Elite
 - GNC Pro Performance AMP Amplified Wheybolic Extreme
 - Optimum Nutrition 100% Whey
 - BPI Sports ISO HD
 - Allmax Isoflex
 - Muscletech Performance Series Nitro-Tech
 - BSN Clean 100% Whey
 - MHP Maximum Whey
 - Zero Carb Isopure
 - Animal Whey

What are the benefits of protein ?

According to webmd protein supplementation can be beneficial in the following scenarios:

- Wehn you are growing as a teenager

- For beginners in strength training
- When you are increasing the intensity of your training
- When you get injured
- When you go vegan

The claim is that the extra protein while helping you with growth, recovery from injury, getting into a program and balancing out the greater toll that the increase of intensity takes on your body. If you want to build one pound of muscle you need about 10 to 14 grams of protein a day extra per day compared to the 80g a serving some of these supplements give you. A [way to calculate your intake which I found is](#)

- Recreational athletes need 0.5-0.75 grams of protein daily for every per pound of body weight
- Competitive athletes need 0.6-0.9 grams per pound
- Teenage athletes need 0.8-0.9 grams per pound
- Athletes building muscle mass need 0.7-0.9 grams per pound

That might sound like a lot but here are some numbers to compare on how you can obtain this amount through normal food:

- one 4-ounce hamburger contains 30 grams of protein
- 6 ounces of tuna has 40 grams of your desired ingredient
- and a single ounce of cheddar cheese has 7 grams.

What are the risks of protein ?

Excessive intake of protein has been linked in some cases to kidney and liver diseases. It has to be said though that the people in question are often bodybuilders who are under suspicion to take a dangerous cocktail of several supplements and that the cross effect and the illegal / prescriptive parts of this combination create this effect. Protein intake has also been shown in some cases to speed up the growth of cancer cells in the body. The recommended [daily intake by the department of health is 55.5g for men and 45g for women](#). So if you use protein powder two times a day you are very likely to be above that. Anything which is more than twice this amount is advised against by the department. The main point being made against protein powders are that it is excessive, not well studied and that the products are being mislabeled. A higher protein diet can be achieved by natural means by consuming

- [red meat](#), such as beef, lamb, and pork
- poultry, such as chicken, duck, and turkey
- [eggs](#)
- [dairy](#), such as milk, yogurt, and cheese

- [beans](#)
- [tofu](#)
- [greek yogurt](#)

A very poignant and negative article about protein and its effects can be found on [this blog](#). The main points are being reproduced here:

- Two of my favorite professional bodybuilders, Nasser El Sonbaty and Mike Matarazzo, recently died in their forties, likely from diet-related health issues. In all probability, their deaths were a result of too much protein consumption, coupled with the use of performance enhancing substances day after day until their organs failed.
- Many companies (and entire industries) have gone to great lengths to convince the public that they need to seek out high protein foods and consume as much protein as possible, without any consideration of the health consequences that accompany excess consumption.
- The amount of protein required by the human body (5-10% of total calories per day) is relatively low in comparison to the other macronutrients. It is, therefore, impossible to be protein deficient when sufficient calories are consumed. This is how nature works. In reality, most people in developed countries, including those following a plant-based diet, eat too much protein, not the other way around.

Personal experience with protein

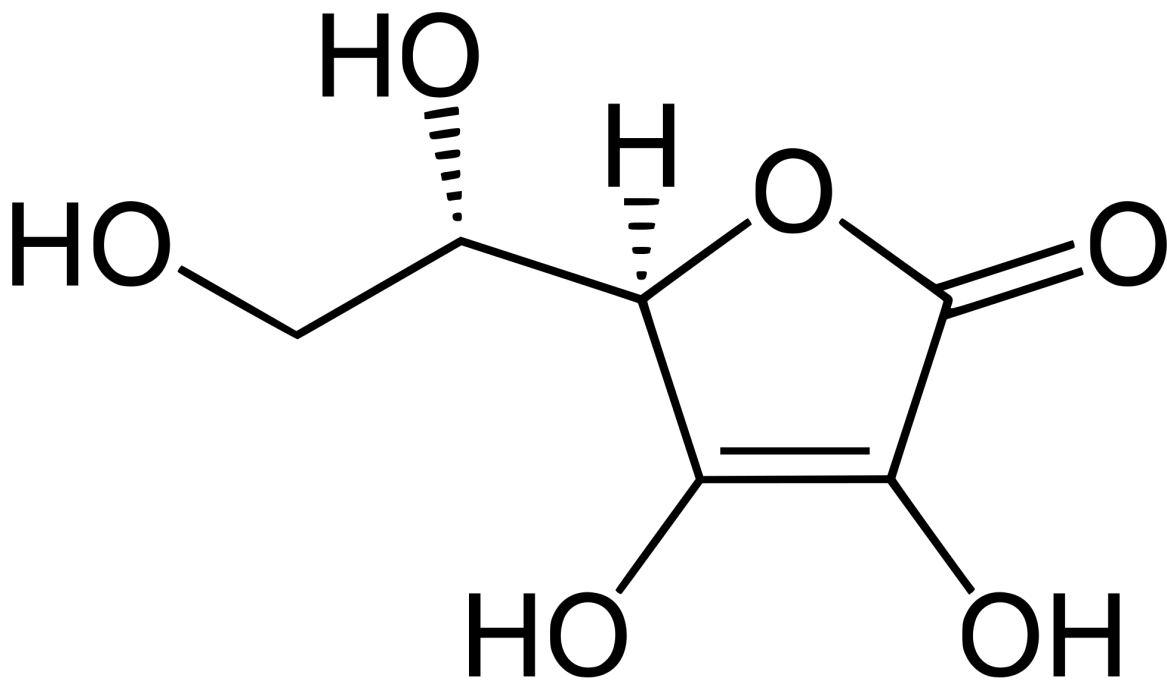
I have been using protein first in my teenage years when I was a teenager. I stopped while I was at college as I got out of shape and did not that much care of myself. Once I went back into lifting in 2014 I started to introduce the powders back in my diet. So far there are no apparent drawbacks from it, but neither did I explode like Arnold taking them. As I stay away from anything that I would have to inject (like testosterone boosters) I would consider it fairly safe to take protein as a supplement. Still, there is not evidence to disprove the claims about the liver and kidneys effects. Out of the supplements I had a closer look at I think protein is one of the easiest to obtain through a healthy diet. Maybe I should reconsider.

Conclusion

Protein is getting more popular and widespread as a dietary supplement. Opinions are split and the risks for liver and kidneys are often cited as a con to protein supplementation. Based on how the body works it can also be taken for granted that with increased activity you will need more proteins to maintain and enhance

athletic performance. The big question as an individual is whether you want to obtain these via natural sources, vegan powder options or the most popular ones where you are getting sold the byproduct of the manufacturing of cheese. The decision is yours to make.

Supplements: Vitamin C



Supplements: Vitamin C

This is an overview based on internet sources about Vitamin C and its uses as a supplement. Please always consult a doctor when you are considering supplementing any kind of vitamins. Especially when you are already ill, take medicine or during pregnancy. I am not an expert or doctor and have reproduced, collected and commented on the information available to me. You can navigate the primary and secondary sources by clicking on the links in the article.

What is Vitamin C ?

Vitamin C is a [water-soluble Vitamin](#) which means that your body does not store it and you have to obtain it via your diet. In fact, humans are one of the fewer species which can not synthesize Vitamin C themselves. [It acts as a reducing agent and is a cofactor in eight enzymatic processes.](#) One of the most important roles of [Vitamin C](#) is related to [synthesizing collagen](#) while it also plays an [important role in the immune system.](#)

Collagen is used to make skin, cartilage, blood vessels and tendons and therefore plays a [vital role in wound healing](#), growth, and [maintenance of bones and teeth](#). Vitamin C is furthermore highly concentrated in immune cells.

Vitamin C is [derived from monosaccharides like glucose through enzyme-driven processes](#). Approximately [70-90% of Vitamin C is absorbed at moderate intake](#) levels between 30 - 180mg daily. A study conducted in Canada showed the mean intake to be 133mg/d for males and 122mg/d for females while the American National Health and Nutrition Examination Survey from 2001 to 2002 found the mean to be 105.2mg/d for adult males and 83.6mg/day for adult females. The degree of absorption of Vitamin C diminishes with higher intake and falls to less than 50% when more than 1g/day is consumed. The total content of Vitamin C in the body ranges from 2g to a minimum of 300mg which is near to showing symptoms of scurvy.

Scurvy was at its height until the end of the 18th century when sailors undertook long journeys with little or no vitamin C intake. This even resulted in death in many cases and therefore became a topic of interest during the mid-1700s when [Sir James Lind](#) experimented and concluded that citrus fruits and juices can cure scurvy. It was [not found out until 200 years later in 1932 that vitamin C was the active component influencing the health of people with scurvy](#) in the Albert Szent-Gyorgyi papers.

While it is uncommon in modern days to suffer from insufficient vitamin c intake, supplementing the vitamin is quite common. According to data from 1999 - 2000 [roughly 35% of adults in the United States take multivitamin supplements containing vitamin c](#) and about 12% different vitamin c supplement. For [children, this number is estimated at 29%](#).

There are about 100000 tonnes of vitamin c produced annually. The main bulk of this comes from China. [There were cases of price fixing by Chinese companies being investigated as prices per kg rose from \\$2.50 to \\$7 kg from 2001 to 2002](#). There was no denial by the companies involved, but they pointed to being pressurised by their government into the price fix. There was another price spike during the 2008 Olympic games when plants were stopped as part of a shutdown of polluting industry in China for better publicity during the games.

You can purchase natural or synthetic vitamin C, in a variety of forms. Tablets, capsules, and chewables are the most popular forms. Vitamin C also comes in powdered crystalline, effervescent, and liquid forms. Doses are ranging from 25 - 1,000 mg.

"Buffered" vitamin C is also available if you find that regular ascorbic acid upsets your stomach. An [esterified form of vitamin C is available for those prone to heartburn](#).

What is recommended Vitamin C intake ?

These numbers vary and are continuously adjusted so this article will reflect the standards by the time of writing in September 2016.

RDA: Recommended Dietary Allowance (RDA) is the average level of sufficient intake to meet the nutrient requirements of nearly all healthy people.

AI: Adequate Intake is established when there is not enough evidence to set an RDA

UL: Tolerable upper Intake Level is the maximum daily intake unlikely to cause adverse effects.

The RDAs for Vitamin C in the United States are

- 90mg/d for an adult male
- 75mg/d for an adult female
- 85mg/d during pregnancy
- 120mg/d during lactation
- 40mg/d 0-6 months
- 50mg/d 7 - 12 months
- 15mg/d 1 - 3 years
- 25mg/d 4 - 8 years
- 45mg/d 9 - 13 years
- 75mg/d 14 - 18 years male
- 65mg/d 14 - 18 years female
- **Smokers** need 35mg/d more than nonsmokers

UL's for vitamin C are 2.000mg/d for adult males and females. You can find more detailed information in the [Dietary Reference Intake report](#) from 2000.

What happens when you have Vitamin C deficiency ?

Vitamin C deficiency shows in the following symptoms:

- Splitting hair
- Decreased ability to ward off infection
- Nosebleeds
- Inflammation of the gums
- Bleeding gums

- Rough, dry, scaly skin
- Decreased wound healing rate
- Easy bruising
- Severe form of deficiency is scurvy

What happens when you take too much Vitamin C ?

The good thing about Vitamin C is that it is [not believed to cause serious adverse effects at high intakes](#). Side effects of unabsorbed vitamin c in the body can be:

- Diarrhea
- Nausea
- Abdominal cramps
- Gastrointestinal disturbances
- Vomiting
- Headache
- Fatigue
- Disturbed sleep

What are good sources of Vitamin C ?

Here is an overview of [Vitamin C as mg / 100g in descending order](#).

Plant sources:

- Kakadu plum
- Camu Camu
- Acerola
- Seabuckthorn
- Indian Gooseberry
- Rosehip
- Baobab
- Chili pepper
- Guava
- Blackcurrant
- Red Pepper
- Chili Pepper
- Parsley
- Kiwifruit
- Broccoli
- Loganberry

- Redcurrant
- Brussels sprouts
- Wolfberry
- Lychee
- Persimmon
- Cloudberry
- Elderberry
- Papaya
- Strawberry
- Orange
- Lemon
- Pineapple
- Cauliflower
- Kale
- Melon
- Garlic
- Grapefruit
- Raspberry
- Tangerine
- Mandarin Orange
- Passion fruit
- Spinach
- Cabbage
- Lime
- Mango
- Rutabaga
- Blackberry
- Potato
- Melon
- Tomato
- Blueberry
- Pawpaw
- Grape
- Apricot
- Plum
- Watermelon
- Banana
- Avocado
- Crabapple
- Onion

- Cherry
- Peach
- Apple
- Carrot
- Asparagus
- Horned Melon
- Beetroot
- Chokecherry
- Pear
- Lettuce
- Cucumber
- Eggplant
- Raisin
- Fig
- Bilberry
- Medlar

Animal sources:

- Calf liver
- Beef
- Oysters
- Cod roe
- Pork
- Lamb brain
- Chicken
- Lamb liver
- Calf adrenals
- Lamb Heart
- Lamb tongue
- Camel milk
- Human milk
- Goat milk
- Cow milk

What does vitamin C interact with ?

This is a short overview of the most commonly observed possible interactions. Please always refer to a doctor, if you are already on medication and want to supplement vitamin c. Without checking you might be doing more harm than good with a well-

meant intervention bought over the counter.

Vitamin C has been **rarely reported to have interactions with Warfarin rarely reported to have interactions with Warfarin**. If you do take any blood thinning medication, please consult a doctor before supplementing Vitamin C.

For **tetracycline, vitamin c seems to promote higher levels of this antibiotic** while decreasing the effects of vitamin c in the body. Similar antibiotics as tetracycline are minocycline (Minocin) and doxycycline (Vibramycin)

HIV / AIDS patients might want to consult a doctor before increasing vitamin c levels as it appears **to slightly inhibit the level of indinavir (Crixivan)** , a medication used to treat these patients.

Vitamin C **also seems to have interactions with estrogen** , which are main components in birth control pills. Vitamin c can cause estrogen to rise even further and oral estrogens can decrease the level of vitamin c in the body. If you already have to monitor your estrogen or vitamin c levels also consult a doctor to get clarity on intakes.

The **functions of Vitamin C as an antioxidant are debated in relation to chemotherapy**. Some experts argue that it interferes with drugs taken for chemotherapy, others say that Vitamin C has a positive effect. Also in these cases sit down with the experts monitoring your chemotherapy before doing more harm than good by taking a vitamin c drink each morning.

Phenobarbital (Luminal), pentobarbital (Nembutal) and secobarbital (Seconal) may decrease the effect of vitamin c.

Maalox and Gaviscon are aluminium containing antacids which could increase the side effects of these medicaments in combination with vitamin c as it increases the body's ability to absorb aluminium.

Vitamin C can cause the levels acetaminophen (Tylenol) in blood levels to rise by lowering the amount of it being passed in the urine. Check with a doctor if you are taking Tylenol.

Aspirin and nonsteroidal drugs can lower the amount of vitamin c by increasing the loss through urine. High vitamin c levels can cause these drugs to stay in the body. If you regularly take aspirin consult your doctor before going over the RDA of vitamin c.

Does Vitamin C work ?

The broader and more randomised are getting the less impact vitamin c has on health. There are a lot of conflicting messages out there which will be represented here. Overall it seems to me, that Vitamin c does not play an active role in preventing diseases, but the lack of it will make you more prone to becoming ill.

- A 2014 study found that vitamin c **can not be recommended as an anti-cancer agent**
- A 2013 Cochrane study found **no benefit** for healthy or high-risk individuals **for lung cancer**
- A 2013 meta-analysis found **no evidence that vitamin C supplementation reduces the risk of myocardial infarction, stroke, cardiovascular mortality, or all-cause mortality**
- Meta-analysis of 44 clinical trials **has shown a significant positive effect of vitamin C on endothelial function** when taken at doses greater than 500 mg per day. The researchers noted that the effect of vitamin C supplementation appeared to be dependent on health status, with stronger effects in those at higher cardiovascular disease risk
- **It has not been shown effective in prevention or treatment of the common cold**
- A 2010 review in the journal *Alternative Therapies in Health and Medicine* **found no role for vitamin C supplementation in the treatment of rheumatoid arthritis**
- A prospective cohort study following 2.000 residents of a rural Japanese community **found risk of stroke to be 29% lower for the individuals with the highest serum levels of vitamin c**
- *Trials involving **marathon runners, skiers, and soldiers** exposed to extreme physical exercise and/or cold environments, prophylactic use of **vitamin C in doses ranging from 250 mg/day to 1 g/day reduced cold incidence by 50%.***

Conclusion

Based on the fact that Vitamin C levels are generally already good in the average population and the benefits of supplementing seem to be minimal I would personally say it is a supplement you can skip provided you are generally healthy and eat a balanced diet. Of course, having a bit of taste to your water from time to time can be nice and that is how I use multivitamin and vitamin c supplements mostly as an alternative to sugar.

Supplements: Vitamin D



Supplements: Vitamin D

Vitamin D is mainly helpful for your bone development either for the very old or young. Always consult a doctor when supplementing on top of a healthy diet. Lack of Vitamin D can cause rickets and osteomalacia. Main sources of Vitamin D are sunlight and fatty fish.

What is Vitamin D ?

Vitamin D is a fat-soluble vitamin who promotes the absorption of intestinal absorption of calcium, iron, magnesium, phosphate, and zinc. There are four forms of Vitamin D which are known as

- Vitamin D1 (Ergocalciferol with Lumisterol)
- Vitamin D2 (Ergocalciferol made from ergosterol)
- Vitamin D3 (Cholecalciferol made from 7-dehydrocholesterol in the skin)
- Vitamin D4 (22-dihydroergocalciferol)
- Vitamin D5 (sitocalciferol made from 7-dehydrositosterol)

The most common debated versions of Vitamin D for supplement purposes are Vitamin D2 and D3. Vitamin D2 has been first discovered in 1931 followed by D3 in 1935. You can increase the vitamin D levels in your system by

- Eating a healthy diet
- Going out into the sun
- Supplement Vitamin D as a pill

Very few foods contain Vitamin D naturally, therefore the **main source of vitamin D is synthesis via the skin in the form of Vitamin D3**. In this process, 7-dehydrocholesterol is converted into Vitamin D3 in animals in two steps involving ultraviolet light.

For this process to work the UV light has to penetrate the skin. This is why Vitamin D deficiency is often linked to countries with less exposure to sunshine (like Ireland) or people with darker skin. UV light at a wavelength of 290 - 320 nanometers penetrates the uncovered skin. Cloud cover and shade reduce the UVB intensity by 50 - 60%. UVB does not penetrate glass, therefore staying inside at a window does not work with the production of Vitamin D3 by the skin.

While it is often claimed, regularly in combination with proposing a need for supplementing Vitamin D, that in far north latitudes and for dark-skinned individuals it is hard to obtain enough Vitamin D via exposure to sunlight, there are also studies who propose that these factors do not inhibit Vitamin D3 production in the body.

The daily recommendations for exposure to the sun for sufficient Vitamin D production vary from 5 - 30 minutes twice daily depending on the source. You will be hard pressed to find official recommendations by government bodies due to the cancer risk that correlates with too much sun exposure. As a rule of thumb for daily use: "Use no sunscreen and avoid sunburn" which can vary considerably from day to day and region. The sun is less likely to provide your daily needs at higher latitudes, in the winter, or if you're older,

An additional source of Vitamin D can and should be your diet. Conditions like milk allergies, lactose intolerance, ovo-vegetarianism and veganism can lead to a lower level of Vitamin D being taken in through your diet. In combination with little sun exposure, this can lead to Vitamin D deficiency. This has become a worldwide issue among the elderly and common in children and adults. A deficiency of Vitamin D is reached at <30nmol/l of serum 25 OHD, the best indicator for Vitamin D levels in humans to date. If you wanted to counteract these trends in your personal case through your diet good sources of Vitamin D are:

- Salmon
- Tuna
- Mackerel
- Fortified milk

- Fortified margarine

To a lesser extent

- Beef liver
- Egg yolks
- Yogurt
- Cheese

In the United States and Canada, milk and margarine are being fortified since it is known that Vitamin D has positive effects for children to avoid rickets. Rickets is a softening of the bones which lead to malformation of the legs and other bone structures if babies between 0 -12 months develop a Vitamin D deficiency.

The third source of vitamin D is to supplement in the form of pills. These come in various forms and colours. You can see a selection of product at the website of [boots](#) or [hollands & barrets](#).

Following tables taken from the [National Institute of health](#) will help you to stay on top of your Vitamin D intake:

Table 4: Tolerable Upper Intake Levels (ULs) for Vitamin D [1]

Age	Male	Female	Pregnancy	Lactation
0-6 months	1,000 IU (25 mcg)	1,000 IU (25 mcg)		
7-12 months	1,500 IU (38 mcg)	1,500 IU (38 mcg)		
1-3 years	2,500 IU (63 mcg)	2,500 IU (63 mcg)		
4-8 years	3,000 IU (75 mcg)	3,000 IU (75 mcg)		
≥9 years	4,000 IU (100 mcg)	4,000 IU (100 mcg)	4,000 IU (100 mcg)	4,000 IU (100 mcg)

Table 2: Recommended Dietary Allowances (RDAs) for Vitamin D [1]

Age	Male	Female	Pregnancy	Lactation
0-12 months*	400 IU (10 mcg)	400 IU (10 mcg)		
1-13 years	600 IU (15 mcg)	600 IU (15 mcg)		
14-18 years	600 IU (15 mcg)	600 IU (15 mcg)	600 IU (15 mcg)	600 IU (15 mcg)
19-50 years	600 IU (15 mcg)	600 IU (15 mcg)	600 IU (15 mcg)	600 IU (15 mcg)
51-70 years	600 IU (15 mcg)	600 IU (15 mcg)		
>70 years	800 IU (20 mcg)	800 IU (20 mcg)		

* Adequate Intake (AI)

Table 3: Selected Food Sources of Vitamin D [11]

Food	IUs per serving*	Percent DV**
Cod liver oil, 1 tablespoon	1,360	340
Swordfish, cooked, 3 ounces	566	142
Salmon (sockeye), cooked, 3 ounces	447	112
Tuna fish, canned in water, drained, 3 ounces	154	39
Orange juice fortified with vitamin D, 1 cup (check product labels, as amount of added vitamin D varies)	137	34
Milk, nonfat, reduced fat, and whole, vitamin D-fortified, 1 cup	115-124	29-31
Yogurt, fortified with 20% of the DV for vitamin D, 6 ounces (more heavily fortified yogurts provide more of the DV)	80	20
Margarine, fortified, 1 tablespoon	60	15
Sardines, canned in oil, drained, 2 sardines	46	12
Liver, beef, cooked, 3 ounces	42	11
Egg, 1 large (vitamin D is found in yolk)	41	10
Ready-to-eat cereal, fortified with 10% of the DV for vitamin D, 0.75-1 cup (more heavily fortified cereals might provide more of the DV)	40	10
Cheese, Swiss, 1 ounce	6	2

* IUs = International Units.

** DV = Daily Value. DVs were developed by the U.S. Food and Drug Administration to help consumers compare the nutrient contents among products within the context of a total daily diet. The DV for vitamin D is currently set at 400 IU for adults and children age 4 and older. Food labels, however, are not required to list vitamin D content unless a food has been fortified with this nutrient. Foods providing 20% or more of the DV are considered to be high sources of a nutrient, but foods providing lower percentages of the DV also contribute to a healthful diet.

[Average intake levels](#) for males from food range from 204 to 208 UI a day, for females between 144 to 276. For older women from 51 - 70 it was 156 UI in the median and for women over seventy 180 UI Day. The women under the same report who took supplements were around 400 UI. If you want an article that can be easily read on how to manage Vitamin D intake and which foods work, as tables are not for everyone, go to

[this article on vitamin D intake on health.com](#).

What are the benefits of Vitamin D ?

Vitamin D [helps to maintain adequate serum calcium and phosphate concentrations which are linked to bone stability and growth](#). It is also believed to prevent rickets in children and osteomalacia in adults. Vitamin D is also connected to the modulation of cell growth, immune function, reduction of inflammation and neuromuscular and immune functions. There are several instances where Vitamin D intake is also said to have a positive influence on cancer and other diseases, however, [a big study from 2009 to 2013 concluded that it is still not possible to specify a relationship between vitamin D and health outcomes other than bone health](#).

What are the risks of Vitamin D ?

The biggest dangers with interventions like supplementing Vitamin D is when they are being misunderstood and people overdose. In the case of Vitamin D this would mean taking too many Vitamin D pills causing Vitamin D toxicity in the body or exposing yourself to long to UV light via natural sun or under a sunbed exposing yourself unnecessarily to a higher risk of skin cancer.

Vitamin D toxicity can lead to

- Anorexia
- Weight loss
- Polyuria
- Heart Arrhythmias
- Vascular calcification
- Tissue calcification

[The use of supplements of both calcium \(1,000 mg/day\) and vitamin D \(400 IU\) by postmenopausal women was associated with a 17% increase in the risk of kidney stones over 7 years in the Women's Health Initiative](#).

Toxic intakes from food or sunlight for Vitamin D are unlikely. If it occurs it is usually because of taking too much Vitamin D in for of a supplement.

Conclusion

Vitamin D is a good supplement for anyone who is at risk of brittle bones because of their age, medical circumstances or diet choices. For generally healthy people with healthy diets, there seems to be slim to no added benefit of taking supplements for

Supplements: ZMA



Supplements: ZMA

This is a quick look at Zinc Monomethionine Aspartate or ZMA. A formula developed by Victor Conte which benefits of higher testosterone levels and quicker strength gains by providing better REM sleep are being doubted most recently as the supporting studies have been conducted by owners of ZMA patents. I am no doctor, so please always consult before deciding to take or not to take supplements.

What is ZMA ?

ZMA is the short version of [Zinc Monomethionine Aspartate](#). The original formula which was developed by Victor Conte contains 30mg of monomethionine and aspartate, 450mg of magnesium aspartate and 10.5mg of vitamin B6. ZMA claims to raise strength levels and enhance hormonal profiles, especially testosterone, by enabling deeper levels of REM sleep and is therefore used as a recovery aid for athletes. [Namely, NFL stars Brye Paup, Stephen Davis, Lester Archambeau and bodybuilders Flex wheeler & Michael Ashley have come forward with positive statements](#) Flex wheeler & Michael Ashley have come forward with positive statements about the product relating it to

enhanced performance.

It should be taken 30 - 60 minutes before sleep and not be supplemented alongside calcium, as it cancels the effects. ZMA is a registered trademark of SNAC Nutrition and costs between 20 - 50€ for ninety capsules depending on the [make](#) and [brand](#) you are getting.

Based on what I could gather the main claims of benefit can be traced back to a [study conducted at Western Washington University](#) in 1998 which [claimed 43.7% higher testosterone levels and 25% greater IGF-1 levels, as well as a 2.5 times greater strength increase than a placebo group](#). These results [could not be reproduced in studies which were conducted in 2004 and 2006](#). Furthermore was the original study sponsored and conducted by a group of people who had an invested interest in a positive outcome due to owning a patent on ZMA.

As a result, the International Society of Sports Nutrition has declared ZMA's effect on muscle building as "not known" which is further underpinned by the [Australian Institute of Sports stating that there is a lack of proof for the benefits of ZMA](#).

What are the risks of ZMA ?

The [risk of ZMA](#), as with many dietary supplements, are based on taking too much in and can be:

- Diarrhea
- Nausea
- Lowering body's immunity
- Lowering levels of HDL

What are alternatives to ZMA ?

- bananas
- nuts
- shredded wheat
- brown rice
- milk
- spinach
- swiss chard
- fortified cereal
- bananas
- salmon

- potatoes
- chicken
- turkey

Conclusion

All in all the main ingredient in ZMA is Zinc. Zinc is better researched and cheaper than ZMA. Therefore I personally think based on what I have read and seen, I think you will get the same, if not better results by only supplementing Zinc. The best source I found in a quick resource mainly related the benefits of ZMA to the extra Zinc that you are taking in by referring to studies about Zinc. The fact that ZMA is patented and pricey smells like another stab of the supplement industry to make something more complicated than it needs to be to make money. Whenever an article talks about "the right formula which can not be replicated by diet intake" i get very suspicious (because that means you have to buy the patented formula x by company y which can be filled in a bottle, branded and sold to you).

That you might not be getting the same benefit from Zinc when taken in a multivitamin as calcium cancels the effects out might be true and can be easily tested by yourself by getting off your multivitamin and swapping it for a Zinc only supplement and measure the results. 90 capsules for 35.99€ also buys a lot of the mentioned natural alternatives. I just bought 6 "fancy" salmon fillets at Tesco from the fresh stand for 21.35€. Get some nuts and spinach with it and you should be fine for the week.

Want to learn more?

I do not only write and research, I also talk about my training. If you want to know more and see me squat, deadlift, jump and fail from time to time like any other human being, check out my **YouTube channel.**

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