NMN EFFECTS ON HUMAN BODY

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DESCRIPTION

About: The Boston Supplement Inc, PURE NMN

In humans, research into the effects of NR and NMN is still gaining traction with a few small-scale registered clinical trials completed and multiple others underway. Ultimately, no mouse study is proof these molecules will work or will fail in humans to treat a disease or affect the lace of aging. We have to test them in people, in rigorous and independent scientific studies.

The single oral administrations of NMN did not cause any significant clinical symptoms or changes in heart rate, blood pressure, oxygen saturation, and body temperature. Laboratory analysis results did not show significant changes, except for increases in serum bilirubin levels and decreases in serum creatinine, chloride, and blood glucose levels within the normal ranges, independent of the dose of NMN. Results of ophthalmic examination and sleep quality score showed no differences before and after the intervention. Plasma concentrations of N-methyl-2-pyridone-5-carboxamide and N-methyl-4-pyridone-5-carboxamide were significantly increased dose-dependently by NMN administration. The single oral administration of NMN was safe and effectively metabolized in healthy men without causing any significant deleterious effects. Thus, the oral administration of NMN was found to be feasible, implicating a potential therapeutic strategy to mitigate aging-related disorders in humans.

Therefore, I give you this guarantee. If after 3 months you do not feel any change in your health and well-being, please contact us and we will refund the cost of all your products. Because until now we have sold our products in some part of the world. Customer satisfaction is 100%

CHAPTER 1

WHAT IS NMN AND DOES IT HAVE ANY SIDE EFFECTS?

NMN is short for Nicotinamide mononucleotide, which is a Vitamin B3 derivative. Although it occurs naturally, you can obtain it from different dietary sources like veggies, milk, and fruits. In your body, NMN generates NAD+ (nicotinamide adenine dinucleotide), which is an essential molecule in your body cells. Let's find out further what NMN is and if it has any side effects.

Unfortunately, if NAD+ levels drop below the minimum limit in your body, you won't be alive for more than 30 seconds. Aside from this, NAD helps activate Sirtuins. If there is no NAD+, Sirtuins can't protect you against different types of diseases and deterioration.

As you get older, NAD+ continues to decrease in your body, which is not good for longevity. Although many foods like tomato, cabbage, broccoli, and avocado contain NMN, the concentration is too low. Moreover, NAD+ molecules are too big to be taken directly. Therefore, it's better to have a precursor supplement, such as NMN.

According to experts, NMN supplements boost your NAD levels in addition to provide SIRT1 genes with NAD+ molecules.

Does it have any side effects?

Many studies have been done on NMN and none of them has found any evidence that it has negative side effects. However, you may rarely have the following side effects if you take NMN supplements without following the given guidelines.

- Stomach upsets
- Rashes
- Dizziness
- Nausea

Anti-aging benefits of NMN:

NMN is a good anti-aging agent as well. So, it can be consumed in order to reverse the aging process. Listed below are two of the popular anti-aging benefits of NMN.

Reduces age-related weight gain

If you consume these supplements, you can reduce your fat and gain muscle. These are the primary ways of improving muscle health and looking much younger.

Boosts metabolism

These supplements can break the nutrients to supply the required power to your cells and reduce stress.

Why should you opt for NMN Supplement?

NMN plays a great role when it comes to creating NAD+. As a result, you get the energy to perform your routine tasks and prevent DNA damage. Besides, NAD+ boosts Sirtuins that increases your longevity working as an anti-aging agent.

NMN supplements boost NAD+ levels in your body, which helps fight symptoms of aging. As a result, you look much younger for your age, which is the dream of most of us. These supplements don't cost a lot but offer a wide spectrum of benefits for those who want to look younger.

Aging is not an inevitable process in the sense most people take it. You don't have to accept this idea. Instead, you may want to take the right steps to fight mutation processes, oxidation, free radicals, and DNA damage. What you need to do is trigger your longevity pathways in order to reverse your aging process.

Supplementing with NMN and following a healthy lifestyle allows your body to fight against all the elements that have a negative impact on your health. Therefore, taking NMN supplements is a stroke of genius.

NAD AND HOW DOES IT RELATE TO AGING?

Aging is a process that all living beings go through. People spend billions on products that may help them fight their aging process. And most of these products claim that they can help reverse the symptoms of aging. We are going to discuss NAD and its precursor, which is known as NMN. We will also find out how they have an impact on your longevity. Without further ado, let's get to the point.

What is NAD?

NAD stands for Nicotinamide Adenine Dinucleotide, which is a coenzyme that your body cells contain. It protects the main organs of your body from many diseases. You can find NAD in two types: NAD+ and NADH.

The role of NADH is to improve your alertness, memory, focus and mental clarity. On the other hand, NAD+ helps maintain a healthy internal organs and neurological system.

The role of NAD+

Given below are the biological processes that are fueled by NAD+. These are the most important functions of NAD in your body. So, increasing NAD levels is paramount.

- Post-translational modifications
- Sustenance of chromosomal integrity
- Epigenetic modifications
- Gene expression
- DNA repair
- Calcium signaling
- NAD+, age-related diseases and overall health

Over the past few years, a lot of research has been done on NAD+ as it helps control biological functions. You can't survive without NAD or NAD precursors. Given below is a description of some findings that shed some light on the importance of this coenzyme.

NAD+ precursors and their role

Your body can produce NAD using NAD+ precursors, and each of them follow a different way or method for NAD+ conversion. Actually, these precursors use natural pathways that help with the NAD synthesis.

NAD precursors can mitigate pellagra, which is a killer disease. Milk and yeast are good source of this coenzyme and helps reduce the symptoms. Other common precursors include NMN, nicotinamide riboside and nicotinic acid.

NMN and its importance

Your body contains a limited amount of NAD+. With time, this amount continues to decline. Therefore, you need to increase this amount using different methods, such as eating veggies, fish, and following a caloric restriction.

You can also supplement with NMN as it can be converted into NAD+. You can eat fruits and veggies but they don't have enough of this coenzyme. Therefore, taking supplements is the only easy way out.

So, you can see that it's possible to slow down the aging process with the help of anti-aging supplements. The idea is to increase the NAD+ levels in your body. Besides, you can also use NAD+ precursors to fight age-related diseases.

If you are looking for an anti-aging supplement, we suggest that you give a go to NMN supplements. They can help you lead an active life that is free of diseases.

CHAPTER 2

HOW THESE NAD+ PRECURSORS MEASURE UP

NR is often thought of as a highly efficient precursor to NAD+, but its cousin molecule NMN, while not an ingredient in Basis, is raising eyebrows as the new kid on the block.

Moving into a new home is never easy. Just because a large bed can fit inside a bedroom doesn't mean it'll fit through the door of the room. So it's typical for beds to come in parts that need to be disassembled to make it through a door and then reassembled once inside.

The same can be said for nicotinamide mononucleotide, a molecule called NMN for short. NMN is a precursor to NAD+, or nicotinamide adenine dinucleotide, meaning it becomes NAD+ through a series of chemical transformations. NAD+ is a critical found in every cell of your body, but levels of NAD+ naturally fall with age, making it — and NMN, as a result — crucial.

However, NMN is like a large bed that movers are trying to get through a door: It doesn't enter the cell easily. One way for NMN to enter the cell is for it to chemically transform into another molecule (called nicotinamide riboside, or NR) before it can enter the cell. NR has earned a name for itself as a highly efficient precursor to NAD+ and can enter the cell as is. NMN, meanwhile,

sometimes becomes NR before entering the cell, where it chemically transforms back to NMN and then ultimately becomes NAD+.

We've learned that NR leads to NAD+ and that it also has its own pathway that bypasses various steps other NAD+ precursors have to take. In early 2019, though, new research revealed NMN might only have to become NR for certain cell types, as NMN can enter cells in the small intestine of mice. It's unclear how this will translate to humans, if at all, but it's teed up NMN as the newer kid on the block, making many wonder: How does it stack up against NR?

NR vs NMN Molecule

Pitting NR and NMN against each other is, for now, somewhat of a moot point because the two molecules have never been studied side by side in humans. The biggest, and most obvious, difference between NMN and NR is size. NMN is simply larger than NR, meaning it often needs to be broken down to fit into the cell. NR, when compared to other NAD+ precursors (like nicotinic acid or nicotinamide) reigns supreme in efficiency.

But give NMN a new door, one it can fit through, and it's a whole new game. This is where cellular transporters come into play. Transporters are proteins that are doors on the cell; they allow molecules to enter the cell without needing to chemically transform.

Why We Need NR and NMN

So you might be wondering: Why should I care? What does it matter that these molecules get into the cell a certain way and how they do it? NR and NMN are both beneficial because they elevate levels of NAD+, which decline with age. NAD+ is vital to cellular metabolism, turning nutrients into cellular energy, and it also activates sirtuins, a set of proteins that regulate cellular health. We all get NAD+ in our bodies thanks to our diet, by consuming foods with NAD+ precursors in them. While NR and NMN can be found in trace amounts in various foods, though, one can't eat enough of anything to boost NAD+ levels. As a result, supplementing with an NAD+ precursor can help mitigate the decline.

Supplementing NR and NMN could provide other myriad benefits as a result of boosting NAD+, though additional research is needed to confirm similar effects in humans.

At the end of the day, though, what we know is that when compared to other precursors, NR is the highly efficient one of the bunch. The latest research on NMN could prime it to be the next great vitamin B3, but for now, more research in humans is needed to better understand how beneficial it could be and how it might stack up against NR. One possibility is that each precursor could provide varying benefits depending on the target, especially if transporters, like the recently discovered one in the gut, are only available in specific cells in the body.

ANTI AGING VITAMIN SUPPLEMENTS

When you're shopping for anti aging vitamin supplements, what should you look for? The best products are likely to be comprehensive multivitamin and mineral formulations that contain all the same vitamins and minerals you're used to, plus some special additions believed to be important for healthy aging. Because we now know that many aging processes are caused by tissue damage done by free radicals, supplements for healthy aging usually focus on antioxidants, substances that capture free radicals.

Antioxidant multivitamins contain a variety of antioxidants that remove free radicals - reactive molecules produced by pollutants, toxins, and metabolic processes - from tissue before they have a chance to react with healthy cells and do damage. Some familiar vitamins and minerals - such as Vitamin C, A, and E, zinc, and selenium - are potent antioxidants, so anti aging vitamin supplements usually contain them. Other antioxidants that are frequently added include lycopene, naturally found in tomatoes; sulforaphane, an extract of broccoli; lutein; and beta carotene. Getting a variety of antioxidants is important because, while they are all beneficial, they don't all act in the same way.

Choose your anti aging vitamin supplements with care - be sure to buy from a reputable source and check the product information for the amounts of all the ingredients. Just like regular vitamin preparations, antioxidant multivitamins should be clearly labeled, and have safe dosage information. Look for the letters "RDA" (recommended dietary allowance) and check what

percentage of this your multivitamin provides. You may also see "EAR" (estimated average requirement) or "UL" (upper intake level). The UL is especially important because it tells you how much of something it is safe to ingest. Never exceed this level, and remember that you receive many nutrients and antioxidants in your diet as well. Too much can be just as bad as too little.

There is still controversy with respect to antioxidant multivitamins. While scientific research has clarified the role that free radicals play in the aging of our bodies, and experts agree that antioxidants are valuable weapons against free radicals, it's unclear whether getting those antioxidants in anti aging vitamin supplements really does much good. There's no doubt that antioxidants found in foods are highly beneficial so, as a first step in an anti aging routine, eat a healthy diet with lots of brightly colored fruits and vegetables, nuts and seeds, and whole grains. This will provide you with beneficial antioxidants. Then you can choose from the range of antioxidant multivitamins to top up your dietary intake and ensure that you've got it covered.

CHAPTER 3

ARE NMN SUPPLEMENTS SAFE?

Nicotinamide Mononucleotide (NMN) is a derivative of niacin and has recently gain attention for its potential anti-aging benefits. Studies done on mice using NMN have demonstrated the supplement's ability to improve overall health and assist with weight loss. Before taking any supplements, consumer's need to review any potential side effects and confirm the safety of the product.

Basics of NMN

NMN is a nucleotide that has been derived from ribose and nicotinamide. The nucleotide is considered a precursor to NAD+, a regulator of proteins and a compound responsible for repairing DNA. When mice in laboratory studies were given NMN supplements, researchers found a dramatic reduction in cell death and an increased restoration of blood capillaries. Besides a greater blood supply, the mice in the study had a greater exercise capacity by as much as 80 percent. In another study, mice were given the supplement in addition to a high-fat diet. Compared to the control group, the mice had fewer signs of fatty liver and better glucose levels. Pharmaceutical companies are also conducting studies to see NMN's effectiveness against diseases such as diabetes and Alzheimer's.

More and more supplement companies have begun offering NMN in powder and capsule forms. Consumers should always review safety information regarding any supplements before consuming them. The United States Food and Drug Administration doesn't require the same safety testing for supplements as pharmaceuticals. Nicotinamide mononucleotide has not been the subject of any safety notices by the United States FDA. In studies, NMN has been noted as being well tolerated by subjects with no side effects reported.

A 2017 study did find that the supplement could increase cholesterol levels in users. The increase in blood cholesterol levels was small, but significant enough to note. Any patients with high cholesterol or any other medical condition should discuss supplementation with their doctors first.

Natural Alternatives

Although supplements are considered widely safe, there are food items containing naturally high levels of NMN including broccoli, green cabbage, cucumber, avocados, and tomatoes. However, supplementation offers more concentrated amounts of the nucleotide. Consumers would need to eat excessive amounts of these food items to reach the same usage amounts as a single supplement dosage.

THE CELLULAR DAMAGES THEORY OF AGING (CDTA) APPROACH TO ANTI-AGING TREATMENT

CDTA supporter's of stimulating the natural production of antioxidants claim that natural antioxidants provide better protection against the damaging effects of free radicals than taking antioxidant supplements. One concern this group has is that the triggering mechanisms for the production of natural antioxidants can be desensitized by the over use of antioxidant supplements. The belief here is that a continuous production of natural antioxidants brought on by very mild activation of the Nrf2 protein is the healthiest possible state for human body. Anything that disrupts this does more harm than good. They also claim that the natural antioxidant production may be disrupted by taking too much of known Nrf2 activators such as curcumin or resveratrol. Some supporters in this group believe that current antioxidant over-supplementation has already created serious health issues.

The main proponents of CDTA support the idea of taking significant amounts of readily available external antioxidants such as vitamin C, E, and other supplements. Many of them recommend taking one or more grams of Vitamin C daily. They believe this can safely reduce the amount of cellular damage free radicals generate. The good news is that some research actually does support this claim. The not so good news is that the concerns of the pro natural antioxidant camp are not being taken seriously. It is also true that, by focusing on a few well known antioxidants, too little attention is being paid to the role antioxidants play in the body.

Humans utilize numerous (1000s) types of antioxidants and their variants. Each antioxidant's biochemical reactions with different kinds of free radicals are unique. A few antioxidants, such as Vitamin A, C, and E are popular and are well known. Most others such as Uric acid, best known for its association with gout, are much less well known but are equally important. Using this antioxidant as an example, Uric acid, which in humans happens to have the largest blood concentration of all antioxidants, is responsible for over half of the antioxidant capacity of human blood serum. Uric acid can reduce oxidative stress caused by high-altitude hypoxia. A great many antioxidants that counteract free radicals also inhibit viruses and bacteria. Most of this CDTA related antioxidant research is only reported in technical journals but the research itself suggests that lots of interesting anti-aging tidbits being put on the shelf for future study or are under reported.

The human body has several enzyme systems that fight free radicals by using antioxidants (vitamins A, C, E, and the mineral selenium) we can only get through our diets and/or by supplements. Vitamins A, C, and E are also essential nutrients. Dietary deficiencies of these antioxidants can cause specific diseases and possibly lead to other chronic and/or degenerative health problems. A Beta-carotene (vitamin A) deficiency can cause night blindness. Vitamin C deficiency can cause scurvy. Vitamin E deficiency can causes nerve conduction problems. In the U.S. a diet rich enough in fruits and vegetables (6 to 8 daily servings) can prevent such deficiencies and is highly recommended. In reality such an ideal diet may be difficult to maintain. This presents a strong argument for supporting the use of at least a few antioxidant supplements.

Bickering among advocates of CDTA has left us with several pressing unanswered questions. Should we rely on naturally produced antioxidants and limit our use of external antioxidant supplements? What are the correct antioxidant supplement dosages you need to slow down the aging process? At the moment there are no agreed upon standards to go by.

CDTA tells us cellular damage is cumulative. This may mean the real answers are relative; i.e. they will vary depending on how old you are. It is a well established fact that the efficiency of many of the body's homeostatic mechanisms declines with age. If you are getting older, say over 60 years of age, your natural antioxidant defences are slowly weakening. How long can you rely on them to adequately protect you? The efficiency of the body's digestive absorption of many foods, including the trace minerals that the natural antioxidant systems require, slowly decreases with age. At a certain point in life an increase in antioxidant supplements and/or supplemental digestive enzymes may really be helpful. Several of the antioxidants produced in our body are becoming available in the supplement market.

The current interpretation of CDTA's vague approach to anti-aging is that to slow down the rate at which cellular damage accumulates you should increase your daily intake of dietary antioxidants (fruits and vegetables) and perhaps take some unspecified amount of various vitamins and anti-aging supplements. With increasing age you may need to increase your intake of vitamins and antioxidant supplements. Until the experts agree on supplement dosages you will have to diligently research any supplement you are interested in.

There are hundreds of health supplements available on the market. Many scientific studies on the benefits of any given health supplement are at odds with each other. Some claim taking supplements has benefits while others claim there are few or no benefits, or that supplements may even be harmful. The vitamin and anti-aging supplement business has become a 23 billion dollar industry that is not being regulated very well. This has allowed the market to become full of overpriced products that may have few real benefits. You need to be careful.

CHAPTER 4

EFFECTS OF NICOTINAMIDE MONONUCLEOTIDE (NMN) ON AGING AND LONGEVITY

Supplementation with Nicotinamide Mononucleotide (NMN) has preventive and therapeutic effects against age-associated functional decline and common ailments of aging. Even though science has improved our understanding of the progressive decline in function our bodies experience because of aging, there is not yet a clear mechanism that can explain why chronic diseases are an inherent part of the aging process. We expect to live longer lives, but our quality of life is affected by age-related diseases.

Maintaining Cellular Energy Levels at Youthful levels

Many of these age-related impairments have common roots at the cellular level and can be traced back to deficits in the production of cellular energy. NMN has an important effect on the production of cellular energy because it is a critical component in the production of NAD+. Levels of NAD+ are of critical importance for keeping mitochondria, the body's powerhouse, working at peak, youthful levels. Because of its importance as a NAD+ intermediate, active supplementation with NMN increases the concentration of NAD+ in the body, providing a readily available supply of this important nutrient for the amelioration of age-associated diseases and conditions. As we get older, NAD+ levels consistently decline, energy production is less efficient, and the aging

process gains momentum, which contributes to the development of many of the “typical” diseases of aging.

When it comes to the production of NAD+, no other nutrient is more important than NMN. In fact, NMN is considered to be the rate-limiting biosynthetic enzyme for the production of NAD+, not only in humans, but in all mammals. Multiple studies have demonstrated that supplementation with NMN promotes the biosynthesis of NAD+ across organs such as the pancreas, liver, muscle, kidneys, eyes, and blood vessels.

Countering Age Related Metabolic Decline

The effects if NMN supplementation go beyond just the increased production of NAD+. Studies done in rodents have shown that NMN improves glucose tolerance in aging mice who developed diabetes because of high-sugar diets. These findings suggest similar effects might be possible in older humans who develop diabetes because of a poor diet. Further studies have demonstrated the benefits of NMN supplementation for improving sugar metabolism as we age. NMN increases the production of insulin, when insulin-resistance has been caused by a high-fat diet. This is achieved by restoring adequate production of NAD+ and by reducing inflammation and stress caused by free radical damage, countering the effects of age-related chronic inflammation. These studies have also shown that NMN reduces inflammation in fatty tissue, and improves sensitivity to insulin across several different organs. Most importantly, these beneficial effects were found to be more effective in old age.

Keeping Circulation Young

The circulatory system carries blood rich in oxygen, exchanges heat and nutrients, and removes waste from all the organs and systems in the body. The aging process may lead to chronic changes that diminish the density of the blood vessels that compromise this system. This decline in blood flow worsens over time and contributes to the occurrence of chronic disease and premature aging.

One of the direct consequences of this reduction in blood flow is the loss of muscle mass. This progressive loss of muscle mass is a huge contributor to decreased quality of life in old age due to its impact on performance and loss of mobility. NAD+ precursors such as NMN increase the production and maintenance of blood vessels by repairing damaged DNA at the cellular level, optimizing mitochondrial energy production, and promoting glucose tolerance.

Sirtuin deacetylase (SIRT1) is a compound critical for the production and maintenance of new and existing blood vessels. NAD+ precursors such as NMN are an effective way of stimulating SIRT1 activity. Studies done in rodent's show that supplementation with NMN has a dramatic effect on the preservation of blood vessels. In one study, NMN was shown to restore the number of blood vessels and increase circulatory density in old mice, effectively reverting circulatory capacity to levels seen in young mice. Remarkably, the mice that received the NMN supplementations demonstrated a 60-80% improvement in muscle endurance.

Preserving a Sharp Mind in Old Age

One of the most exciting findings regarding how NMN can promote the production of NAD+, is that administration of NMN was shown to cause an increase of NAD+ production in the brain. Findings from recent studies suggest that NMN may be of benefit for preserving cognitive function and protecting neuronal health. Studies done with models for Alzheimer's showed that NMN had significant, beneficial effects on memory and cognition. NMN not only is protective against the decline in cognitive abilities associated with old age, but has found to be of value for preservation of neurons after a stroke.

Extending Cellular Lifespan

Research into the anti-aging properties of NMN shows that the notion of aging being an irreversible process may no longer be an absolute, experiments done in human stem cells have demonstrated that providing an environment rich in NMN extends the lifespan of these cells by delaying age related decline that is a result of continued cell replication. These anti-aging benefits have been related to NMN's ability to maintain a high production of NAD+ for production of energy in the cell's mitochondria.

Anti-aging research has shown that supplementation with NMN, a key NAD+ intermediate, is effective at mitigating age-associated metabolic decline and slowing the progression of a multitude

of age-related diseases. NMN has beneficial effects on the production of energy at the cellular level, improves tolerance to glucose, reduces inflammation, helps preserve the circulatory system, repairs DNA, and has beneficial effects on the preservation of cognitive function. NMN has also shown potential as a therapeutic agent against neurodegenerative disorders typical of old age. Supplementation with NMN may be of benefit in preserving endurance and mobility. Preserving the functions of these diverse systems across the body promotes health and longevity and significantly improves quality of life as aging progresses.

NAD FOR WEIGHT LOSS

Our body is a magical mystery maze of chemical reactions governed by dictations from our DNA and yes - the daily choices we make.

We all understand our food choices and exercise impact our body fat levels, but we also need to understand more about our inner chemistry. As we have all learned the hard way - fat loss is NOT as simple as calories in and calories out!

By focusing on manipulating the edicts from our DNA - we can influence our chemistry to work with us, in our fat loss endeavors - not against us.

Our Goal: Taking the mayhem and cacophony that happens with daily living - and orchestrating our chemistry into a beautiful symphony.

We have all felt there are saboteurs lurking to spoil our fat loss efforts - it is true.

Here, we are going to talk about a big one - losing NAD.

Bottom line: NAD allows sugars, fats, and proteins to be converted into energy

Research on NAD for fat loss centers around the various building blocks of NAD, most importantly vitamin B3. Milk is a good source of B3. Don't just go and pop B3 supplements - there are various forms of B3. B3 in larger doses can cause side effects, even though it is a water soluble vitamin, and too much of the wrong form of B3 can be counter productive in the efforts to boost NAD.

NAD (nicotinamide adenine dinucleotide) is in every cell of the body and an absolute necessity for mitochondrial function - those power houses, or energy producers in our cells.

NAD decreases with age, but researchers agree NAD is 1 in the anti-aging process - as it dictates to turn off those genes that contribute to the aging process.

How do we lose NAD?

- Aging... a normal process of aging, is the dissipation of NAD - unless we step in a consciously set out to raise our NAD levels.

- Alcohol - also a major culprit in every aspect of aging (no the resveratrol in red wine is minimal, and we cannot rationalize more wine to get more resveratrol)
- DNA alterations from lifestyle, medications... again unless we step in and consciously protect our DNA
- Lack of exercise - sedentary lifestyle - sitting is the new smoking
- Certain foods can decrease our levels over time - but certain foods can help increase our levels.

Sirtuins

Sirtuins (AKA longevity genes) are a group of 7 proteins that play a role in aging by regulating cellular health. Sirtuins must have a good supply of NAD. Sirtuins control DNA expression and aging, manage all things cellular... alas... if NAD levels are declining... so is cellular efficiency & productivity.

Fasting - often used as an effective tool in fat loss - maybe this is one of the reasons why: Fasting has been shown to increase NAD - which activates Sirtuins.

There is great hope in sirtuins research with cancer, metabolic issues, glucose metabolism, HIV & neurodegenerative disorders.

Clinically healthy yet obese people have shown to have lower NAD/Sirtuin levels in studies. Calorie restriction has shown to increase these levels, and to decrease oxidative stress.

The Sirtfood Diet

Yes - there is a Sirtfood diet. It is also affectionately referred to as "hacking the skinny gene diet".

The sirtfood diet combines calorie restriction and "Sirtfoods". I have no problem with the SIrtfoods (except for the red wine) because they are great foods for us to eat for many reasons: walnuts, olive oil, blueberries, coffee, turmeric...

Why do I put huge faith in the Sirtfood diet?

To eat enough of these foods to activate Sirtuin activity, well that would not at all be consistent with the calorie restriction aspect of the diet.

I am a big supporter of intermittent fasting for most people - if their physician agrees the person is a candidate for intermittent fasting. However a few things to keep in mind about calorie restriction, which is NOT intermittent fasting.

- When your body is calorie restricted, it uses up its emergency energy stores, or glycogen, also burning fat and muscle... never good to sacrifice muscle - the definition of biting your nose to spite your face!
- Glycogen usage releases the water it used for storage. This is "water weight."
- In the first week of extreme calorie restriction, only about one-third of the weight loss comes from fat, while the rest comes from water, muscle and glycogen,
- As soon as your calorie intake increases, your body replenishes its glycogen stores, and the weight comes right back.How miserable and de-motivating.
- body will often lower it's metabolic rate, which nobody wants- making it easier to gain weight in the future.

CHAPTER 5

BOOSTING NAD+ LEVELS MAY BE THE KEY TO EFFECTIVE ANTI-AGING TREATMENTS

Human beings have been searching for the fountain of youth since the dawn of time, whether we're talking about a literal fountain, or a figurative one. Unfortunately, as you probably know, no miraculous anti-aging fountain exists. We simply cannot stop aging—not with a pill, not with a cream, not with a serum, not even with an elixir. But here's a big fat however for you. Though we cannot actually stop aging, thanks to modern science, and a revolutionary cellular health supplement called Basis, we can age better.

The Anti-Aging Science Of NAD+

Over the last quarter century, scientists have made a ton of progress in understanding how aging works on the cellular level. And the most significant thing they've discovered has to do with a molecule called nicotinamide adenine dinucleotide, or NAD+.

What is NAD+? It's a coenzyme found in all living cells. It performs two basic jobs in the human body without which life would not be possible. First, NDA+ plays a key role in metabolism by

helping to turn nutrients into energy. Second, it functions as a kind of helper molecule for proteins called sirtuins.

Also known as “the longevity genes” or “guardians of the genome,” siruins are basically the CEOs of your cells. They protect your DNA and thus regulate the cellular aging process. However, sirtuins require NAD+ to work. And, for whatever reason, NAD+ levels in humans and all other organisms decline with age.

But here’s the good news. A 2017 study published in the journal Science found that boosting NAD+ levels in mice actually reversed the signs of aging in the tissue and muscles of older mice. In fact, the reversal was so drastic that researchers could no longer tell the difference between four-month-old mice and two-year-old mice.

Though hardly conclusive, this study strongly suggests that boosting NAD+ levels in humans could have incredible health benefits.

That’s where Basis comes in.

Basis By Elysium Health

Created by Elysium Health, Basis is a proprietary formulation of crystalline nicotinamide riboside and pterostilbene, which the human body converts into NAD+. In a double-blind, randomized, placebo-controlled clinical trial, it was demonstrated that, on average, Basis increases NAD+

levels by 40 percent. These elevated NAD+ levels won't necessarily stop the aging process. But they will certainly maximize cellular health, boost energy, and support healthy sleep. This in turn should allow people who are in good health to maintain it longer, and thus age better.

Basis anti-aging supplements are designed for long-term use by adult's of all ages. Each bottle of Basis contains 60 caplets. Each caplet is vegetarian, vegan, gluten-free, nut-free, and contains no artificial colors or flavors. They contain 250mg of crystalline nicotinamide riboside and 50mg of pterostilbene, which have no known side effects. Elysium recommends taking two capsules in the morning, with or without food. Thus, each bottle of Basis contains a 30-day supply.

Science strongly suggests that NAD+ is the future of the anti-aging movement. However, you don't actually have to wait for the future. You can boost the NAD+ in your system today with Basis from Elysium Health.

8 KEY DIFFERENCES BETWEEN NMN & NR

If you've been keeping up with aging and science news, you've probably already heard of a critical molecule known as nicotinamide adenine dinucleotide (NAD). You may even already know that NAD is critical to human survival, and decreases as we get older and undergo metabolic stresses. There are a few different ways of increasing NAD, and although the science here is important, it

can easily turn into an eye-glazing-over experience for most people who don't study cells for a living.

Here's a quick breakdown of the key differences between nicotinamide mononucleotide (NMN) and nicotinamide riboside (NR):

1. NR is a vitamin. NMN is not.

NMN is not a form of vitamin B3, and there are no clinical trials to prove it increases NAD in humans. NMN is also not the type of molecule that would ever be considered as a vitamin as it contains a phosphate, which affects its ability to enter cells.

2. NR can enter the cell. NMN cannot.

NR is the largest part of NAD that can enter the cell. This is why NMN supplements turn into NR first before they are able to make NAD.

3. NMN makes NAD in 3 steps. NR requires only 2.

In its supplement form, NMN must become NR first before entering the cell. Then once inside the cell, it converts back into NMN to make NAD. This is a 3-step and rather inefficient process.

4. NR has 4 published human studies. NMN has 0.

NMN's only published trials are in mice and rats. NR has at least 4 published human studies and all of them confirm NR is a safe and effective way of increasing NAD in people.

5. NR is taken orally. NMN is mostly studied by injection.

Despite NMN being sold as a pill to people, NMN is frequently studied through injections in rodents. In NR trials, it's most commonly added to food or water. Plus, in all of NR's published human studies it was administered in capsule form, which represents the recommended way of taking NR as a vitamin.

6. NR has at least 4 published trials confirming it's safe for humans. NMN has 0.

There are no data available stating whether or not NMN is safe for human consumption. Careful analysis of all the information available on NR confirms it is safe and well-tolerated.

7. NR has 3 FDA safety notifications. NMN has 0.

The only commercially available form of NR, NIAGEN, has twice been successfully reviewed under FDA's new dietary ingredient ("NDI") notification program and has also been successfully

notified to the FDA as generally recognized as safe ("GRAS"). NMN has no safety notifications from the United States FDA.

There aren't any human studies comparing NR to NMN (because NMN doesn't have any clinical trials), but we do have them in animal models. And there the evidence is clear: NR is a more efficient way of increasing NAD. That's because NR and NMN are structurally different in one very important way: NR can get directly into the cell, and NMN can't.

CHAPTER 6

VITAMIN B3 SOURCES, BENEFITS AND DEFICIENCY

Vitamin B-3, also called niacin, is one of the eight water-soluble B complex vitamins. Niacin is required by all living cells, as it helps in the release of energy from carbohydrates, fats, and proteins. Niacin is also required for the synthesis of amino acids and fat needed for nucleic acid formation.

This vitamin is different from the other vitamins of the B-complex group, because an essential amino acid, tryptophan serves as its precursor.

Niacin is a major component of the coenzymes - nicotinamide adenine dinucleotide (NAD) and nicotinamide adenine dinucleotide phosphate (NADP). These compounds help remove hydrogen atoms during organic reactions in the body.

Since it is a water-soluble vitamin, niacin is absorbed by the intestine; but very little is stored in the body and any excess of the vitamin which is not used by the body is excreted in the urine. Therefore, it becomes very important to include a regular source of Vitamin B3 through daily dietary sources.

Benefits of Vitamin B-3:

- Niacin plays an important role in helping the body get rid of toxic and harmful chemicals.
- Niacin promotes insulin secretion and increases insulin sensitivity. This is found to be quite effective in stabilizing blood sugar levels and preventing the advance of type I diabetes in some patients, if niacin supplements are given early enough at the onset of diabetes.
- Vitamin B3 required for the production of genetic material in our cells, called deoxyribo nucleic acid (DNA). Deficiency of vitamin B3 has been directly linked to genetic harm.
- It also assists the body manufacture various sex and stress-related hormones in the adrenal glands and other related parts of the body.
- Vitamin B3 is useful in improving blood circulation, and helps reduce cholesterol levels in the blood.
- Vitamin B3 is important for converting protein, fat and carbohydrates into energy.
- It helps the proper functioning of the digestive system and promotes healthy skin, hair and nerves.

Vitamin B3 deficiency symptoms -

Early symptoms of deficiency include:

- Muscular pain

- Skin eruptions, including wrinkles, rashes, dry and coarse scaly skin in areas exposed to sunlight
- Indigestion
- Anorexia - loss of hunger
- Headaches and body aches
- Swollen, red tongue
- General tiredness
- Mood swings along with irritability
- Dizziness
- Nausea and vomiting
- Dementia
- Death in very severe cases

Consequences of Vitamin B3 deficiency -

Severe deficiency of niacin commonly leads to pellagra - typical symptoms include dermatitis, old age dementia, fits, sore tongue and diarrohea. In some people, the skin becomes scaly, cracked and pigmented in those parts exposed to sunlight. Eruptions can appear in the skin leading to mental confusion and stupefaction. Inflammation of the mucous membranes of the mouth and digestive abnormalities also develop in niacin deficiency.

Inadequate intake of iron and vitamins B2 and B6 increase the risk of niacin deficiency.

Dosage of Vitamin B3 -

Vitamin B3 requirements are affected by many factors such as age, body size, level of physical activity, any major illness, pregnancy and lactation. The daily allowance of vitamin B3 should be based on caloric intake. Tryptophan is an amino acid that serves as a Vitamin B3 equivalent.

The Recommended Daily Allowance for women is around 15 milligrams each day and for men, it is around 15 to 19 milligrams each day. RDA for children - 13 mg and RDA for infants - 6 mg.

Extreme high doses of niacin can cause niacin maculopathy, a thickening of the macula and the retina, which leads to blurred vision and blindness.

What foods are high in vitamin B3?

The body's niacin requirement can be met to a large extent by eating protein rich foods because the human body can easily convert tryptophan, an amino acid, into niacin.

Dietary sources which are rich in Vitamin B3 include -

- Meat, poultry, fish
- Peanuts, dried nuts
- Milk and eggs contain small amounts, but are excellent sources of tryptophan, which is converted in the body into niacin.
- Sunflower seeds
- Dairy products including cottage cheese
- Vegetable sources include the husk of cereals, green vegetables, peas, beans, tomatoes etc.

Storage of Vitamin B3 -

Vitamin B3 is one of the more stable water-soluble vitamins and is minimally prone to damage by air, light, and heat.

However, it is better to keep the vitamin away from strong light. If on vitamin B3 supplements, store them at room temperature in a dry place that is free of moisture.

Who are more vulnerable to Vitamin B3 deficiency?

People with chronic intestinal problems, including diarrohea, inflammatory/irritable bowel disease, alcoholics, and people with poor protein intake - in these group of people Vitamin B3 deficiency can be triggered very easily.

A word of caution for people planning to take Vitamin B3 supplement -

Do not take B3 supplements on your own if you:

- Are allergic to niacin or any other niacin containing vitamin supplement.
- Suffering from restricted liver function.
- People with peptic ulcer.
- Diabetes.
- Gallbladder malfunctioning

Combat Aging and Help Prevent Chronic Disease with NMN

What if I told you that there was a supplement you could take to reverse symptoms of chronic disease, combat signs of aging, and increase your vitality well into your “golden years”? Sounds too good to be true, right? Well, in this case, the health benefits of the supplement in question,

NMN, entirely live up to the hype! Nicotinamide mononucleotide (NMN) is a derivative of the B-vitamin niacin that dramatically improves health and longevity by serving as a precursor to NAD+, a compound that plays a crucial role in energy production, metabolism, and gene expression in the body.

The Biochemistry of NMN

To understand how NMN benefits the body, it helps to first have some background knowledge of the biochemistry of this potent compound.

Nicotinamide mononucleotide (NMN) is a compound derived from ribose, a sugar, and nicotinamide, also known as vitamin B3. The human body has enzymes that use NMN to generate another compound, nicotinamide adenine dinucleotide. Nicotinamide adenine dinucleotide comes in two forms: An oxidized form (NAD+) which accepts electrons from other molecules and a reduced form (NADH) that donates electrons to other molecules. From here on I will refer to nicotinamide adenine dinucleotide as NAD+, but remember that it does come in these two forms.

NAD+ has two crucial, primary functions in the body:

NAD+ participates in redox reactions. Redox reactions are those that involve a transfer of electrons from one reaction or molecule to another. The most well-known redox reaction in the body is

cellular energy production, which includes glycolysis, the citric acid cycle, and mitochondrial respiration. NAD+ serves a vital role in each of these components of energy production.

NAD+ is a substrate for enzymes that add or remove chemical groups from proteins. For example, NAD+ functions as a cofactor for sirtuins, proteins that regulate DNA transcription, apoptosis, inflammation, and mitochondrial biogenesis and assist in the function of poly (ADP-ribose) polymerase, a group of proteins that regulate DNA repair and genomic stability.

Low NAD+ Leads to Disease and Aging

Research has found that NAD+ levels decrease in aging and certain chronic disease states. The loss of NAD+ limits redox reactions and deprives enzymes of the substrate they need to function correctly; this ultimately leads to an energy deficit that impairs DNA expression and repair, promotes inflammation, and downregulates metabolism. However, a growing body of research indicates that restoration of optimal NAD+ levels can reverse many of the symptoms associated with chronic disease and aging. How can we naturally boost the body's levels of NAD+? The solution lies with NMN supplementation.

The Many Health Benefits of NMN

Nicotinamide mononucleotide (NMN) supplementation serves as a precursor to NAD+. When we boost NMN levels in the body, we can enhance the biosynthesis of NAD+ and alleviate symptoms

associated with depletion of this crucial nutrient. In fact, NMN supplementation has been found to improve various parameters of health, including physical endurance and muscle strength, neurological function, heart health, insulin sensitivity, dyslipidemia, body weight, and gene expression.

Endurance and Muscle Strength

Decreased physical endurance and muscle strength are often considered to be "inevitable" symptoms of the normal aging process. However, recent animal research indicates that NMN can prevent these declines in aging mice. In fact, one study found that consumption of NMN enhanced endurance and muscle strength in aged mice to such a degree that they became as healthy as their much-younger peers.

Aging

Endurance and muscle strength are not the only physical symptoms impacted by the aging process; body weight, energy metabolism, blood lipids, insulin sensitivity, and vision are also adversely affected by the aging process. Excitingly, NMN supplementation has been found to suppress age-associated weight gain, enhance metabolism, improve insulin sensitivity and plasma lipid levels, benefit vision, and prevent adverse alterations in gene expression in aging mice. These effects highlight the therapeutic potential of NMN as a beneficial anti-aging intervention for humans.

CHAPTER 7

10 ANTI-AGING FOODS TO SUPPORT YOUR 40S-AND-BEYOND BODY

Beautiful, glowing skin starts with how we eat, but these anti-aging foods can also help with more than that.

NMN is found in fruits and veggies such as avocados, broccoli, cabbage, edamame, and cucumbers. So does this mean that if we binge on veggies that we'll live forever? Not exactly. The supplement that the mice drank was much higher in NMN than vegetables are. While we are unable to eat enough veggies to replicate the exact effects of the study, heading for the produce aisle could still prove to have some anti-aging perks.

When we pack our diet with vibrant foods loaded with antioxidants, healthy fats, water, and essential nutrients, our body will show its appreciation through its largest organ: our skin. After all, the skin is often the first part of our body to show internal trouble, and there's only so much that lotions, creams, masks, and serums can do before we need to take a closer look at what's fueling us.

Researchers have even concluded that eating fruits and veggies is the safest and healthiest way to combat dull complexions and fine lines. Ready to glow? Here are 10 of the best anti-aging foods to nourish your body for a glow that comes from within.

1. Watercress

The health benefits of watercress don't disappoint! This nutrient-dense hydrating leafy green is a great source of:

- calcium
- potassium
- manganese
- phosphorus
- vitamins A, C, K, B-1, and B-2

Watercress acts as an internal skin antiseptic and increases the circulation and delivery of minerals to all cells of the body, resulting in enhanced oxygenation of the skin. Packed with vitamins A and C, the antioxidants in watercress may neutralize harmful free radicals, helping to keep fine lines and wrinkles away.

2. Red bell pepper

Red bell peppers are loaded with antioxidants which reign supreme when it comes to anti-aging. In addition to their high content of vitamin C which is good for collagen production, red bell peppers contain powerful antioxidants called carotenoids.

Carotenoids are plant pigments responsible for the bright red, yellow, and orange colors you see in many fruits and vegetables. They have a variety of anti-inflammatory properties and may help protect skin from sun damage, pollution, and environmental toxins.

3. Papaya

This delicious superfood is rich in a variety of antioxidants, vitamins, and minerals that may help to improve skin elasticity and minimize the appearance of fine lines and wrinkles. These include:

- vitamins A, C, K, and E
- calcium
- potassium
- magnesium
- phosphorus
- B vitamins

The wide range of antioxidants in papaya helps to fight free radical damage and may delay signs of aging. Papaya also contains an enzyme called papain, which provides additional anti-aging benefits by working as one of nature's best anti-inflammatory agents. It's also found in many exfoliating products.

So yes, eating papaya (or using products containing papain) may help your body shed dead skin cells, leaving you with glowing, vibrant skin.

4. Blueberries

Blueberries are rich in vitamins A and C, as well as an age-defying antioxidant called anthocyanin. This is what gives blueberries their deep, beautiful blue color.

These powerful antioxidants may help protect skin from damage due to the sun, stress, and pollution by moderating the inflammatory response and preventing collagen loss.

5. Broccoli

Broccoli is an anti-inflammatory, anti-aging powerhouse packed with:

- vitamins C and K
- a variety of antioxidants
- fiber
- folate
- lutein
- calcium

Your body needs vitamin C for the production of collagen, the main protein in skin that gives it strength and elasticity.

6. Spinach

Spinach is super hydrating and packed with antioxidants that help to oxygenate and replenish the entire body. It's also rich in:

- vitamins A, C, E, and K
- magnesium
- plant-based heme iron
- lutein

This versatile leafy green's high vitamin C content enhances collagen production to keep skin firm and smooth. But that's not all. The vitamin A it provides may promote strong, shiny hair, while vitamin K has been shown to help reduce inflammation in cells.

7. Nuts

Many nuts (especially almonds) are a great source of vitamin E, which may help repair skin tissue, retain skin moisture, and protect skin from damaging UV rays. Walnuts even contain anti-inflammatory omega-3 fatty acids that may help:

- strengthen skin cell membranes
- protect against sun damage
- give skin a beautiful glow by preserving its natural oil barrier

Sprinkle a mix of nuts on top of your salads, or eat a handful as a snack. Don't remove the skin, either, as studies show that 50 percent or more of the antioxidants are lost without the skin.

8. Avocado

Avocados are high in inflammation-fighting fatty acids that promote smooth, supple skin. They also contain a variety of essential nutrients that may prevent the negative effects of aging, including:

- vitamins K, C, E, and A
- B vitamins
- potassium

The high content of vitamin A in avocados can help us shed dead skin cells, leaving us with gorgeous, glowing skin. Their carotenoid content may also assist in blocking toxins and damage from the sun's rays and also help to protect against skin cancers.

9. Sweet potatoes

The orange color of the sweet potato comes from an antioxidant called beta-carotene which is converted to vitamin A. Vitamin may help restore skin elasticity, promote skin cell turnover, and ultimately contribute to soft, youthful-looking skin.

This delicious root vegetable is also a great source of vitamins C and E both of which may protect our skin from harmful free radicals and keep our complexion radiant.

10. Pomegranate seeds

Pomegranates have been used for centuries as a healing medicinal fruit. High in vitamin C and a variety of potent antioxidants, pomegranates may protect our body from free radical damage and reduce levels of inflammation in our system.

These healthy fruits also contain a compound called punicalagins, which may help to preserve collagen in the skin, slowing signs of aging.

CHAPTER 8

THE EFFECTS OF NICOTINAMIDE MONONUCLEOTIDE (NMN) ON AGING AND LONGEVITY

Supplementation with Nicotinamide Mononucleotide (NMN) has preventive and therapeutic effects against age-associated functional decline and common ailments of aging. Even though science has improved our understanding of the progressive decline in function our bodies experience because of aging, there is not yet a clear mechanism that can explain why chronic diseases are an inherent part of the aging process. We expect to live longer lives, but our quality of life is affected by age-related diseases.

Maintaining Cellular Energy Levels at Youthful levels

Many of these age-related impairments have common roots at the cellular level and can be traced back to deficits in the production of cellular energy. NMN has an important effect on the production of cellular energy because it is a critical component in the production of NAD+. Levels of NAD+ are of critical importance for keeping mitochondria, the body's powerhouse, working at peak, youthful levels. Because of its importance as a NAD+ intermediate, active supplementation with NMN increases the concentration of NAD+ in the body, providing a readily available supply of this important nutrient for the amelioration of age-associated diseases and conditions. As we get older, NAD+ levels consistently decline, energy production is less efficient, and the aging

process gains momentum, which contributes to the development of many of the “typical” diseases of aging.

When it comes to the production of NAD+, no other nutrient is more important than NMN. In fact, NMN is considered to be the rate-limiting biosynthetic enzyme for the production of NAD+, not only in humans, but in all mammals. Multiple studies have demonstrated that supplementation with NMN promotes the biosynthesis of NAD+ across organs such as the pancreas, liver, muscle, kidneys, eyes, and blood vessels.

Countering Age Related Metabolic Decline

The effects if NMN supplementation go beyond just the increased production of NAD+. Studies done in rodents have shown that NMN improves glucose tolerance in aging mice who developed diabetes because of high-sugar diets. These findings suggest similar effects might be possible in older humans who develop diabetes because of a poor diet.

Further studies have demonstrated the benefits of NMN

Supplementation for improving sugar metabolism as we age. NMN increases the production of insulin, when insulin-resistance has been caused by a high-fat diet. This is achieved by restoring adequate production of NAD+ and by reducing inflammation and stress caused by free radical

damage, countering the effects of age-related chronic inflammation These studies have also shown that NMN reduces inflammation in fatty tissue, and improves sensitivity to insulin across several different organs. Most importantly, these beneficial effects were found to be more effective in old age.

Keeping Circulation Young

The circulatory system carries blood rich in oxygen, exchanges heat and nutrients, and removes waste from all the organs and systems in the body. The aging process may lead to chronic changes that diminish the density of the blood vessels that compromise this system. This decline in blood flow worsens over time and contributes to the occurrence of chronic disease and premature aging.

One of the direct consequences of this reduction in blood flow is the loss of muscle mass. This progressive loss of muscle mass is a huge contributor to decreased quality of life in old age due to its impact on performance and loss of mobility. NAD+ precursor's such as NMN increase the production and maintenance of blood vessels by repairing damaged DNA at the cellular level, optimizing mitochondrial energy production, and promoting glucose tolerance.

Sirtuin deacetylase (SIRT1) is a compound critical for the production and maintenance of new and existing blood vessels. NAD+ precursors such as NMN are an effective way of stimulating SIRT1 activity. Studies done in rodents show that supplementation with NMN has a dramatic effect on

the preservation of blood vessels. In one study, NMN was shown to restore the number of blood vessels and increase circulatory density in old mice, effectively reverting circulatory capacity to levels seen in young mice. Remarkably, the mice that received the NMN supplementations demonstrated a 60-80% improvement in muscle endurance.

Preserving a Sharp Mind in Old Age

One of the most exciting findings regarding how NMN can promote the production of NAD+, is that administration of NMN was shown to cause an increase of NAD+ production in the brain. Findings from recent studies suggest that NMN may be of benefit for preserving cognitive function and protecting neuronal health. Studies done with models for Alzheimer's showed that NMN had significant, beneficial effects on memory and cognition. NMN not only is protective against the decline in cognitive abilities associated with old age, but has found to be of value for preservation of neurons after a stroke.

Extending Cellular Lifespan

Research into the anti-aging properties of NMN shows that the notion of aging being an irreversible process may no longer be an absolute, experiments done in human stem cells have demonstrated that providing an environment rich in NMN extends the lifespan of these cells by delaying age related decline that is a result of continued cell replication. These anti-aging benefits

have been related to NMN's ability to maintain a high production of NAD+ for production of energy in the cell's mitochondria.

CONCLUSION

It is quite common to come across anti aging products containing Niacinamide. Most of these products are meant to heal acne and have also shown considerable efficacy in healing fine wrinkles, skin blotchiness, yellowing of the skin and in restoring the desired amount of moisture and pigmentation back in to the skin.

Based on several scientific studies, it has been successfully shown that the substance, which is supposedly the precursor of NADP and NADPH coenzymes, works well to reduce the above mentioned effects. It works by restoring the NAD levels in the skin cells and thereby increasing skin rejuvenation. Besides, it also helps in protecting the sensitive skin cells against damage.

An additional component, also known as the a-lipoic acid is used in conjunction with the drug, in order to increase its efficacy against aging. The lipoic acid also helps in increasing and maintaining the needed NAD levels in the body. The acid is also helpful in preventing and curing diseases like diabetes, Alzheimer's disease and Parkinson's disease. A-lipoic acid is primarily used with the substance in order to increase Sir2P activity in the body. Sir2P is the very gene which reduces the aging process of skin cells, thereby making them look attractive and youthful even at an old age.

Although, Niacinamide is a well tolerated drug, yet it is recommended that the daily consumption of the drug and anti aging creams based on it should not exceed two or three grams at most. Besides, it is highly suggested that you consume the drug in conjunction with a B-complex.

Is it Safe to Use Niacinamide Gel to Get Rid of Wrinkles?

It is common to have topical niacinamide products throughout all anti-aging product stores which are mainly use to get rid of acne. It contains skin rejuvenation properties which have shown significant improvement in:

- Fine wrinkles
- Hyperpigmentation and inflammation spots
- Red blotchiness
- Poor texture of the skin
- Skin sallowness (yellowing)
- Stimulating collagen production
- Increase elasticity and moisture levels in skin

All of these above-mentioned common aging skin problems usually make you look much older than your usual age. Based on several scientific studies, it has proven that this precursor of co-enzymes (NADH and NADPH) which are important for maintaining levels of NADH and NADPH as lacking of these particular co-enzymes able to speed up aging process. In other words, by restoring the levels of NAD, it will help to prevent cellular damage and improve regeneration which could extent the lifespan of human cells.

In order to enhance the anti-aging performance of niacinamide, a-lipoic acid is included to enhance Sir2p activity as well as increasing NAD levels. This little known acid is essential in battling diseases such as diabetes, Alzheimer's disease and Parkinson's disease. For your information, Sir2p is a gene that involved in extending the lifespan of cells which able to reverse the aging process.

Recommended daily consumption

Niacinamide is stable, safe and well tolerated in topical formulations even at relatively high concentrations. To be on the safe side, it is recommended to take two to three grams for an anti-aging program with a corresponding decrease in niacin. It should be given with a complete B complex or multivitamin.