

No. 3: Mega-Mix Muesli

This just about has it all.

As you know I'm all for making your own anything so you know what goes in it and that goes for muesli too.

Most shop bought mueslis have a wheat base and added sugar so will have a higher glycaemia index (GI) than this one made out of my favourite oats (see recipe No. 1 for health benefits of oats), barley, rye and quinoa. This lower GI base will release its energy more gradually and help reduce harmful blood sugar spike as well as giving you all the additional health benefits of the other cereals. You can then get creative and throw in all the dried fruit, nuts and seeds you can get your hands on. Every batch will be different and every mouthful a different taste sensation (I've got a feeling I've nicked that strap line from an advert somewhere). All the sweetness comes from the fruit so there should be no need to add sugar.

Serve with extra fresh fruit (bananas and any berries my favourite combination) to top up the vitamin C and taste level, a little milk and a favourite yogurt (soya yogurts are good if you really want to maximise health benefits – see recipe No. 1).

With all that you have got a fantastic combination of slow release carbohydrates (from the cereals and fruit), protein (from the oats, quinoa, nuts, milk and yogurt), antioxidant vitamins (from the fruit and dried fruit – see Recipe No. 2 for notes on antioxidants), minerals (in all of it) and essential fatty acids (in the nuts and seeds (see below for the Science behind Omega-3s): all in a low fat, absolutely delicious package.

There is so much 'good stuff' in every ingredient in this recipe that I'm going to take the unusual step of writing the recipe in a table with some nutritional information supplied. Don't let this list limit your creativity: if you find it and you like it then throw some in. My favourite shop to source most of this stuff is Julian Graves. You can buy the individual cereals from most health food shops.

Ingredients	Nutritional information
Oats (mix of small and large)	<ul style="list-style-type: none"> • A source of soluble fibre shown to lower 'bad' cholesterol and reduce the risk of heart disease. • Oat protein (avenalin rather than the gluten in wheat) is nearly equivalent to soy protein which has been shown to be equal to meat, egg and milk protein. Protein content ranges from 12-24%, the highest among cereals. • Low GI. • Apparently they have the perfect balance of carbohydrate and protein for human consumption.
Rye flakes	<ul style="list-style-type: none"> • A member of the wheat tribe rye with a lower gluten content than wheat and a higher proportion of soluble fibre. • Seems to be active in the prevention of prostate cancer.
Barley flakes	<ul style="list-style-type: none"> • Contains all 8 essential amino acids. • Eating whole grain barley can regulate blood sugar for up to 10 hours after consumption compared to white or even whole grain wheat, which has a similar GI. • Another source of the soluble fibre shown to reduce 'bad' cholesterol, also found to 'smooth out' the glucose and insulin response when eaten with higher GI foods (same for oats).
Quinoa flakes	<ul style="list-style-type: none"> • Pronounced keen-wah. • High protein content (12-18%). • Contains a complete balanced set of essential amino acids. • A good source of dietary fibre. • High in phosphorous, magnesium and iron. • Gluten free and considered easy to digest.
Whole unblanched almonds	<ul style="list-style-type: none"> • Rich source of the antioxidant vitamin E • Rich in monounsaturated fat (found to lower 'bad' cholesterol). Also associated with raising blood levels of 'good' cholesterol. • Claimed health benefits include improved complexion, movement of food through the colon and prevention of cancer.

	<ul style="list-style-type: none"> Recent studies have shown that the constituents of almond have anti-inflammatory, immunity boosting, and anti-hepatotoxicity effects.
Whole hazelnuts	<ul style="list-style-type: none"> Rich in protein and unsaturated fat. Contain significant amounts of thiamine and vitamin B6. Good source of vitamin E.
Whole cashew nuts	<ul style="list-style-type: none"> Good source of thiamine, iron, magnesium, phosphorous and zinc. Kelly Holmes says she ate cashews to help replenish her strength after races.
Dark & golden raisins	<ul style="list-style-type: none"> About 60% sugar, most of which is fructose so you get the sweetness without the high GI sugar hit. High in certain antioxidants.
Dried cranberries	<ul style="list-style-type: none"> Classed as a 'superfruit' for their nutritional content and antioxidant properties. Cranberry tannins have anti-clotting properties and may reduce urinary tract infections and the amount of dental plaque-causing oral bacteria. These are the same tannins that are supposed to give red grapes their cancer prevention properties and in a study of 20 fruits cranberries beat red grapes into a very poor second on the levels of these tannins.
Dried goji berries	<ul style="list-style-type: none"> High levels of vitamin C (comparable to many citrus fruits) in the whole fruit means that unusually for dried fruit they still contain a significant quantity (they make great trekking food when you can't carry fresh fruit). Also high in iron and selenium.
Crystallised pineapple & papaya	<ul style="list-style-type: none"> A good source of manganese (pineapple) and vitamin C (both) the main reason to add a few chunks is just that they taste good and add a little sweetness.
Toasted coconut strips	<ul style="list-style-type: none"> A surprising addition to the list considering its notably high %age of saturated fat. There has however been much debate as to whether the saturated fats in coconut are healthier than from other sources and the latest I've heard is that they are. Polynesian populations that consume large quantities of coconut meat have raised cholesterol but this is not associated with higher rates of heart attack and cardiovascular disease (the link between raised cholesterol and heart disease is at best tenuous as

	<p>often people with high cholesterol levels just have a very poor general diet and take little exercise so there are masses of complicating factors). Race horses fed on coconut were found to be leaner – so eat coconut if you want to be a race horse.</p>
Pumpkin seeds	<ul style="list-style-type: none"> • Good source of zinc (important for the immune system). • 1 gram of pumpkin seed protein contains as much of the essential amino acid tryptophan (precursor of serotonin, the ‘happy hormone’) as a full glass of milk. • A good source of magnesium, manganese, phosphorus, and phytosterols, which can benefit the liver and increase immune response. • Pumpkin seeds contains fatty acids which help maintain healthy blood vessels and nerves, and are loaded with essential fatty acids that help to maintain healthy blood vessels, nerves and tissues.
Sunflower seeds	<ul style="list-style-type: none"> • Contains the essential fatty acid Omega-3. • Excellent source of dietary fibre, protein, Vitamin E, B Vitamins, and minerals such as potassium, magnesium, iron, phosphorus, selenium, calcium and zinc. • Rich in cholesterol-lowering phytosterols.
Flax/ linseeds	<ul style="list-style-type: none"> • High levels of Omega-3 fatty acids (see below). • High in lignans which may benefit the heart and possess anti-cancer properties. Studies performed on mice found reduced growth in specific types of tumors. Initial studies suggest that flaxseed taken in the diet may benefit individuals with certain types of breast and prostate cancers. • May also lessen the severity of diabetes by stabilizing blood-sugar levels. • Has a mild laxative effect so you can stop buying those expensive little bottles of yogurt that claim to relieve ‘digestive discomfort’. Don’t go wild though, remember too much of a good thing.....
Yogurt coated raisins	<ul style="list-style-type: none"> • Just because they taste good and you can pick them out of the muesli as a treat before you add the milk.

Method

1. Take a big bowl and add as much of each ingredient as you like.
2. Mix it all together with you hands.
3. Store in an airtight container.

Top Tips

- This is a complete meal and doesn't have to be limited to the breakfast table. If you know you are going to be 'on the run' all day then put a couple of handfuls of your muesli in a plastic tub in the morning before you leave (with a few berries if you have them), grab a banana, a yogurt and a spoon and throw the lot into your bag. You then have access to a perfectly balanced, low fat, tasty meal at any point during the day without having to resort to some dodgy service station sandwich or take away on the way home because you are about to faint from hunger.
- If you are late home and can't be bothered to cook this also makes a great quick supper.
- It also makes a pretty good 'meal replacement' if you are on a bit of a diet. Substituting this for either your lunch or dinner for a few days can be a really effective way of regulating your calorie intake and losing a couple of extra pounds (not recommended for long term dieting as that should be much more about changing your long term eating habits) and avoids drinking shakes of over priced chemicals that claim to do the same thing.

The Science bit

Balancing your Omega-3s (It's all about fish and flax)

Omega 3's and Omega 6's are both essential fatty acids in that, unlike other fats, we have to have in our diet as our bodies cannot make them. In the body, essential fatty acids are primarily used to produce hormone-like substances that regulate a wide range of functions, including blood pressure, blood clotting, blood lipid levels, the immune response and the inflammation response to injury and infection.

But the focus is all on Omega 3's at the moment – why is that?

There are three essential Omega-3 fatty acids. Our bodies can't make any of them from scratch but if we have the shortest chain one in our diet it can make the two longer ones from it. That would all seem simple enough but it's complicated by the fact that this elongation process is slowed by the presence of Omega-6 fatty acids. **They both compete for the same enzymes and the Omega-6's usually win.** It's a bit like not being able to put your IKEA chest of drawers together because your big brother has stolen the Allen key to assemble his shelves (not very much like it I accept but I'm hoping the analogy helps).

The substances made from Omega-3 and Omega-6s in our bodies often have opposing functions (i.e. anti-inflammatory rather than inflammatory) and imbalances are therefore thought to be important in **immune/inflammatory-system response**. Good research now shows conclusively that fish oil supplements (high in Omega-3s) can reduce the inflammation of **arthritis**. The anti-inflammatory properties of Omega-3s are also relevant in diseases such as **lupus** and **asthma**.

Intake is also thought to **improve circulation and reduced blood pressure** and therefore reduced risk of **coronary heart disease, varicose veins** and **stroke**. Omega-3 fish oils (preferably with the fish still attached) really are a must for anyone with **cardiovascular risk** (which lets face it is all of us because how are most of us to know if we're at risk until it happens?). In a major clinical study in 1999 of 11,324 patients with a recent myocardial infarction, treatment of 1 gram per day of Omega-3 fatty acids reduced the occurrence of death, cardiovascular death and sudden cardiac death by 20%, 30% and 45% respectively. If you've had one heart attack **eating just one**

servicing of oily fish a week cuts your likelihood of having another heart attack by a third. But why wait until the first heart attack?

The protective effect of Omega-3s in cardiovascular health presumably works because Omega-3s help **thin your blood** so can have the same protective effect as taking aspirin. This means you probably shouldn't be taking Omega-3 supplements if you are also on long term aspirin use. If in doubt my usual rule of thumb applies – don't take supplements unless advised by your doctor, just eat good food. It makes everything so much easier.

60% of the dry weight of your brain is fat so it's not surprising that the type of fat we eat affects its composition and function. In a study on Omega-3 fatty acids published in the April 2007 *Journal of Neuroscience* a group of mice were genetically modified to develop accumulation of amyloid and tau proteins in the brain similar to that seen in people with **poor memory**. After three months mice on a balanced 1:1 Omega-6 to Omega-3 diet were noted to have a lower accumulation of beta amyloid and tau protein than mice receiving a typical American diet (with a high ratio of Omega-6 to Omega-3). Some research suggests that these abnormal proteins may contribute to the development of memory loss in later years. Another study also concluded that Omega-3 exerts a neuroprotective action in **Parkinson's disease**.

Other well publicised studies have found improvement in **developmental health and reduction of aggressive and attention deficit behaviours** in children that have led to some schools supplementing their pupils' diet with essential fatty acids. In 2005 the results of a large UK project following 14,000 women over 15 years reported that the amount of Omega-3 in a pregnant woman's diet helps to determine her **child's intelligence** and fine motor skills as well as their 'propensity to anti-social behaviour'.

There is also evidence that Omega-3 fatty acids might be helpful in cases of **depression and anxiety**. Omega-3 fats (especially one of the long chain ones) catalyse reactions in your bodies that make **serotonin** (the 'happy' hormone) and are also needed to build the docking ports in brain cells that serotonin and other neurotransmitters attach themselves to. Maybe this is the reason that very low fat diets make us feel so miserable ☺ (that and no chocolate ice cream obviously).

Several studies also report possible anti-cancer effects of Omega-3 fatty acids, improved immune function and improved hormone balancing during menopause and.....I could go on....

What's not to like?

As usual dietary studies are complicated by all sorts of life-style factors and for every report that says Omega-3's are good for you there is someone to say they don't make a difference. But, if you read on and think about it in terms of our evolutionary history it just seems impossible that we can have changed our diet so radically over such a short space of time and it not have had an impact.

Why is this Omega-3 balancing such a problem all of a sudden?

Haven't Omega 6's always been around? (I hear you ask)

Well yes they have but not naturally in such great quantities or so out of balance with the Omega 3's (you used to have a fighting chance of getting hold of the Allen key). Studies suggest that the **evolutionary human diet, rich in game animals, seafood and other sources of Omega-3**, may have provided a ratio of Omega-6 to Omega-3 ranging from **1:1 to 4:1**. Typical Western diets provide ratios of between **10:1 and 30:1**, dramatically skewed toward Omega-6. Our bodies and brains are not adapted to this new balance, we can't cope and our health (or lack of it) shows it. Fortunately there are several simple ways of **getting the Omega-3 balance back**.

1. EAT MORE FISH.

Typically we used to have more fish in our diet. The most widely available source of the longer Omega-3's (ready assembled) is cold water oily fish such as **salmon, herring, mackerel, anchovies and sardines**. Oils from these fish have a profile of around **seven times as much Omega-3 as Omega-6**. Other oily fish such as tuna also contain Omega-3 in somewhat lesser amounts. It is not as simple as it used to be though because of the potential presence of heavy metals and fat-soluble pollutants which may accumulate up the food chain. Hence the recommendation that you only need eat **oily fish 3 times a week**.

Although fish is a dietary source of Omega-3 fatty acids, fish do not synthesize them; they obtain them from the algae in their diet (so you could just eat algae – good luck with that). Other non-oily, white fleshed fish and shell fish are also good because they are low fat and contains very little of either Omega-6 or Omega-3 so they are kind of neutral as far as the balance goes. Therefore, if you are eating any fish instead of meat (meat always has more 6 than 3) then you are helping to shift the Omega-3 balance in your favour.

I try and **switch one portion of meat for fish most days and make sure I eat oily fish several times a week**. But remember every little helps and to bank the good things you do rather than beat yourself up about the times you miss. A recent study shows that **eating fish just once a week reduces your risk of developing Alzheimer's by 60%**. It increasingly seems that most 'age related' diseases are nothing of the sort and show later in life due to an age related extension of poor life-style habits. For instance only 10% of Alzheimer's is thought to have a genetic link.

2. EAT FREE RANGE MEAT, EGGS AND DAIRY

Just like what we eat affects our bodies, what animals eat affects theirs. Generally, **grass-fed animals accumulate more Omega-3's** in their meat than grain-fed animals (which accumulate relatively more Omega 6's). So when we changed from being **hunter/gatherers** eating grass and herb fed animals to being **farmer/shoppers** eating grain fed animals we significantly shifted the Omega-3 balance.

The Omega-6 to Omega-3 ratio of **grass-fed beef** is about 2:1 compared to grain-fed beef which usually has a ratio of 4:1. In most countries, commercially available **lamb** is typically grass-fed, and thus higher in Omega-3 than other grain-fed or grain-finished meat sources (in the United States, lamb is often finished, i.e. fattened before slaughter, with grain, resulting in lower Omega-3).

Once a low fat option, the fat content of **chicken** meat has perhaps been most drastically altered by intensive production. Crammed into barns with no room to exercise and fed on fattening grain, chicken meat has not surprisingly gone the same way pizza eating people do when confined to the sofa. **Chicken meat now has ten times as much fat as it used to** (there is as much fat in a modern chicken breast as in a hamburger) and up to **100 times less Omega-3**. Free-range seem worth the extra few quid now? And it doesn't stop there. With free-range chicken being so much more expensive, if it doesn't specifically say, where do you think the chicken comes from in your sandwiches and salads and restaurant dishes? I rarely order chicken when eating out now.

Game meat should still be good but you can't rely on it. In the woods near where I live they rear pheasants for commercial shoots. The ground is liberally strewn with grain and the fat pheasants can barely be bothered to run away let alone fly when I spring (gazelle like) past them on my morning

run. The pheasants are shot (gee that must be hard) and then sold at the local butchers. The Omega-3 quality of their meat must be affected but if you didn't go running in the woods how would you know?

Even **fish** doesn't escape. Farmed salmon has significantly reduced Omega-3 levels compared to 'free range'.

Eggs produced by chickens fed a diet of greens and insects produce higher levels of Omega-3 fatty acids (mostly the short, building block, ones) than chickens fed corn or soybean.

Milk and cheese from grass-fed cows may also be good sources of Omega-3. One UK study showed that half a pint of milk provides 10% of the recommended daily intake of the short chain Omega-3, while a piece of organic cheese the size of a matchbox may provide up to 88%.

The **microalgae** *Cryptocodinium cohnii* and *Schizochytrium* are rich sources of one of the long chain Omega-3's and can be produced commercially in bioreactors. This is the only source of this fatty acid acceptable to vegans. Oil from brown algae (kelp) is a source of the other long chain Omega-3. Some **vegetables**, too, contain a noteworthy amount of Omega-3, including **strawberries and broccoli**.

3. WATCH YOUR INTAKE OF FOODS HIGH IN OMEGA-6

If you look at the ratios of Omega-6 to Omega-3 fatty acids in some common oils you can see why our Omega-3 balance is so out of kilter. Soybean 7:1, sunflower (no Omega-3), cottonseed (almost no Omega-3), grapeseed oil (almost no Omega-3) and corn oil a massive **46:1** ratio of Omega-6 to Omega-3. Remember we are aiming for a ratio of 1:1 or at the most 4:1 so if we are eating large quantities of oil with no Omega 3 or ratios of 46:1 that is going to be pretty tough to achieve.

Canola oil 2:1, **olive oil** 3-13:1 and **peanut oil** (no Omega-3) also seem to have skewed ratios but because these consist of approximately 80% monounsaturated fatty acids, (i.e. neither Omega-6 nor Omega-3) they don't significantly effect the balance either way. So, substituting them for the above oils can help get your balance back.

Nuts have recently been in the news for their high Omega-6 ratio. **Walnuts** are one of few nuts that contain appreciable Omega-3 fat and even they only have a ratio of approximately 4:1 Omega-6 to Omega-3. But nuts are so good

for us in so many ways (worth a whole article in themselves at a later date) that I'm sure we shouldn't stop eating them. The old adage of 'everything in moderation' applies here and a small handful of mixed nuts a day is plenty to get all you need from their nutritional benefit without overloading on the Omega-6. And remember Omega-6 is still an essential oil. It's not bad in its self just when it's out of balance with Omega-3 so if you eat some nuts you should also.....

4. EAT MORE FLAX

This is the toppest of top quick fix Omega-3 balancing tricks.

Six times richer than most fish oils in Omega-3, **Flax (aka linseed)** and its oil are perhaps the most **widely available botanical source of Omega-3**. Flaxseed (linseed) oil consists of approximately 55% short chain Omega-3 and has a ratio of approximately **1:3 Omega-6 to Omega-3**.

Its reverse ratio makes it the perfect balancer for Omega-6 excess but doesn't negate the need for watching your Omega-6 intake. If you remember corn oil has a ratio of 46:1 so you are going to need an awful lot of flax to put that right. Also this is still the short chain Omega-3 so if it's outcompeted by Omega-6 it won't be converted to the longer chain Omega-3s your body also needs.

The seeds are available in brown, yellow or golden varieties all with similar nutritional profiles and a subtle nutty flavour. I keep a small open pot by my cooker so it is easy to add half a teaspoon or so to every porridge, soup, stew or salad I make and of course they are always in **Mega Muesli** where they help balance the Omega-6 in the nuts.

In summary

Omega-3s and Omega-6s are both good but whereas Omega-6's are bold and will come find us we have to go looking for the rather shy Omega 3-s. If we are not careful we can have too much of a good thing and be rather overpowered by the forceful Omega-6's with adverse effects to our health.

The accumulation of the tricky to construct long-chain Omega-3 fatty acids in our bodies is more effective when they are obtained directly from food or when competing amounts of Omega-6's do not greatly exceed the amounts of Omega-3. In plain (?) English this means that if you want to ever be able to

use your chest of drawers you should either go to John Lewis and buy it ready assembled (eat fish), limit your brother's access to the house so you have a chance to get hold of the Allen key once in a while (cut down on Omega-6' rich oils and switch to free-range meat) or get some of your mates round so your brother is out numbered (eat flax/ linseeds). Actually a combination of all three but I think the metaphor starts to break down here a little.