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www.reachmd.com  
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Good and Bad Dietary Fats Explained

### HEALTHY BALANCE: OMEGA-6 AND OMEGA-3 FATS

You are listening to ReachMD, The Channel for Medical Professionals. Hi, this is Dr. Thomas Bersot, President of the National Lipid Association, and I'd like to welcome you to Lipid Luminations hosted by Dr. Larry Kaskel and presented by the National Lipid Association. Do you know your omega-3, omega-6 ratio? You are listening to ReachMD XM160, The Channel for Medical Professionals. Some suggest human beings evolved and a diet with a ratio of omega-6 to omega-3 essential fatty acids of approximately 1 whereas our diet now of most Americans is estimated to be about 16:1 and is believed to promote the pathogenesis of many chronic diseases including cardiovascular disease. Welcome to Lipid Luminations. I am Dr. Larry Kaskel, your host and joining me gain today, Dr. Seth Baum, Cardiologist and Medical Director of the Integrative Heart Care Center from Boca Raton, Florida and he is here to explain the importance of the omega-6, omega-3 ratio for cardiovascular disease prevention.

DR. LARRY KASKEL:

Seth, welcome back to the show.

DR. SETH BAUM:

Well, thank you for having me again.

DR. LARRY KASKEL:

Can we start first by just explaining what is an omega-3 and what is an omega-6 fatty acid for those who haven't heard about it yet?

DR. SETH BAUM:

Well, first of all I think we should explain the nomenclature for that just because so many people ask me about it, you know, the issue of saturation versus unsaturation always comes up.

DR. LARRY KASKEL:

Go for it.

DR. SETH BAUM:

So saturated fat is one that is complete with hydrogen atom. So there are no areas of desaturation, no areas of double bonds, and when you start removing hydrogen atoms, and start having double bonds, then you have areas of unsaturation. So you go from a saturated fat to a monounsaturated fat where there is one area of unsaturation and then you can go to a polyunsaturated fat where there is more than one area where there is a double bond. So the omega-3s and the omega-6s are polyunsaturated fatty acids and the 6 stand for the position of the first double bond counting actually from the end of the molecule.

DR. LARRY KASKEL:

Now you have confused everybody.

DR. SETH BAUM:

Really.

DR. LARRY KASKEL:

That's okay. No, it is heady, heavy stuff. Yeah, I think it helps to see it, but I appreciate the attempt at clarifying the nomenclature.

DR. SETH BAUM:

Okay, wait, wait, wait. Let me give it just one more shot here.

DR. LARRY KASKEL:

Go ahead.

DR. SETH BAUM:

So basically, the polyunsaturated fatty acids have more than one double bond. The 3 just means where that first double bond is and the 6s where the first double bond is at the sixth position versus the third position.

DR. LARRY KASKEL:

So where would a Trans fat fit in? What does that do? Is that adding more double bonds?

DR. SETH BAUM:

It's really the shape of the molecule. The cis versus trans are the shapes of the molecule and the trans fat obviously, I don't want to go down that road, only because it will get even more confusing, but basically the trans being bad for you if you will and cis generally speaking being good for you. There are some exceptions to that rule.

DR. LARRY KASKEL:

So if we look at an average cell in our body and each cell has a cellular membrane and those cellular membranes are made up of fatty acids and there should be a certain ratio of 3:6 in that membrane. So where do we get the information or the ideal ratio. Is that based on guesstimates or is it based on some science?

DR. SETH BAUM:

Several things. It is based on science and it is based on our understanding of what we have evolved from really. If you look at from an evolutionary standpoint where our diets were many moons ago that's where you come up with that original position of, you had mentioned 1:1 ratio of omega-6, omega-3. Some people think may be the optimal ratio would be omega-6 to omega-3 of 3:1. So 3 times as much omega-6 to omega-3. I think we need to take this for a moment another sort of complex discussion, but I think it is very, very important. Lets look at omega-3 and omega-6 and let's just imagine side by side and you have the start point of the omega-6 on one side and the start point of the omega-3 on the other. The omega-6 on one point, the start point, they are both 18 carbons long, okay. The omega-6 start point is linoleic acid, the omega-3 alpha linolenic acid.

DR. LARRY KASKEL:

You must be a fascinating date.

DR. SETH BAUM:

Now, so those are both 18 carbons long. Those are truly essential fatty acids because our bodies can make them. They are really where the omega-6s and the omega-3s start off and the important thing here is that there is competition for the enzymes that elongate and desaturate both of those fatty acids and that's really, really important because if you consume too much of the omega-6s they will win and basically you go down that chain of desaturation and elongation and create more of the omega-6 end products then you will the omega-3.

DR. LARRY KASKEL:

So some of the end products of 6s, for my simple brain, are more pro-inflammatory omega-3 byproducts are antiinflammatory. Would you say that that's a simpleton understanding?

DR. SETH BAUM:

That's a great understanding and also the omega-6s are more prothrombotic.

DR. LARRY KASKEL:

Excellent.

DR. SETH BAUM:

And the omega-3s are more antithrombotic.

DR. LARRY KASKEL:

So we want a milieu that is obviously antithrombotic and antiinflammatory.

DR. SETH BAUM:

Correct.

DR. LARRY KASKEL:

All right. So you have these 2 omegas that are competing.

DR. SETH BAUM:

And they do so down the line. So from desaturation elongation standpoint they do stay down the line. You get to the 20 carbon and, you know, everyone knows about araquidonic acid, that's an omega-6. Its counterpart on the omega-3 side is going to be EPA or eicosapentaenoic acid and then there is a 22 carbon one down on the omega-3 side that's even longer obviously than EPA and that's DHA. Now EPA and DHA really come from fish or originally actually from algae.

DR. LARRY KASKEL:

Right.

DR. SETH BAUM:

And although we see the enzymatic capability of our bodies making those the reality is we really are very inefficient at making them and that's really the sticking point here and that's why we should be eating fish and/or taking fish oil supplement because we just don't have

the ability to manufacture it as much as we should.

DR. LARRY KASKEL:

Seth, so what food source that we are consuming in mass quantities in the United States is making our ratio so crazy out of whack with too much 6 and not enough 3?

DR. SETH BAUM:

First of all, all commercially baked goods have a plethora of omega-6s. So all of the oils, you know, safflower, sunflower oil, any cooking oil really will have a lot of omega-6 in it. There are omega-3s as ALA that are in the same foods as some omega-6 as LA and that would be some of the nuts, you know, walnuts, other nuts, and some oil that are derived from nuts, but if you remember the problem is that even if you start consuming that imagine or you assume that you are going to create the downstream product EPA and DHA from that precursor you are going to be wrong and that's part of the problem and flax is a great example of that. People consume flax because they think they are going to get a good omega-3 but in reality what they end up getting is just the ALA part of it and they don't get the EPA and the DHA.

DR. LARRY KASKEL:

All right. Let's move to clinical practice. I am in the office tomorrow and I want to start my patient on 2 g of fish oil because I think their diet is terrible and they have high triglycerides and I believe that this fish oil is going to benefit every cell membrane in their body. Now I have a choice. What kind of fish oil do I recommend to them? There is Wal-Mart, there is Costco, there is Lovaza. There are pharmaceutical grade fish oils on the market. How do I pick and how do I convince or steer my patient to the right product?

DR. SETH BAUM:

Okay, well first of all there are couple of things to recognize. When somebody is picking a fish oil product what they need to focus in on is that the active ingredient, if you will, is the DHA and the EPA. You have to look at the back of the label.

DR. LARRY KASKEL:

Right.

DR. SETH BAUM:

And you have to add up DHA and EPA. So its not 2000 mg of fish oil you are looking for, its 2000 mg of DHA plus EPA.

DR. LARRY KASKEL:

Right, I don't need the omega-6, I don't need the vitamin E, I don't need other stuff.

DR. SETH BAUM:

I don't need anything else. It's the DHA plus EPA. So that's what they have to add up. Now for every 1000 mg of combined DHA plus EPA on average this is a statistical thing. So it's not going to work, you know, across the board, but on average you get an 8% decline in triglycerides for every 1000 mg of DHA plus EPA that you consume. So now you put your patient on 2000 of combined DHA and EPA, they should go down about 16%. EPA actually functions more as a precursor for eicosanoids or, you know, the prostaglandins, prostacyclin, and DHA is actually incorporated more in the cell membranes. So you might want to focus if you are really interested in cell health on DHA. DHA also is represented in our bodies much more than EPA on about 6:1 ratio.

DR. LARRY KASKEL:

And our brains like DHA and the developing foetus' brain.

DR. SETH BAUM:

Correct. Our brains and our eyes like DHA and frankly there is no EPA in our brains and our eyes. So DHA probably should be emphasized over EPA.

DR. LARRY KASKEL:

How long does it take if I start someone on a nice dose of fish oil? How long would it take for their body to actually take up the oil into their cell membranes and actually incorporate it? Is it a week for the turnover, a month, 3 months, any idea?

DR. SETH BAUM:

Yes. Actually within a matter of a few weeks that you actually get incorporation into the cells.

DR. LARRY KASKEL:

So you can see a response within a month.

DR. SETH BAUM:

Yes.

DR. LARRY KASKEL:

Should be able to. Okay, so back to the question of finding high quality fish oil. How does one go about it as a physician?

DR. SETH BAUM:

Well, as a physician I think you have to be very careful and speak to the colleagues who perhaps know something about this. There are number of different products on the market. There is something called [www.consumerlab.com](http://www.consumerlab.com) which just recently did an analysis of 50 fish oil products. You can look there and you can see what's the most concentrated and best products out on the market.

DR. LARRY KASKEL:

Who are in the top 3?

DR. SETH BAUM:

In the top 3, VitalOils 1000 is the most potent fish oil on the market with 1000 mg of combined DHA and EPA per single soft gel. There are Lovaza, I believe, number 2 at 840 per single soft gel and then there are a few others that are in the 600 to 700 range.

DR. LARRY KASKEL:

I mean I still have trouble trying to explain to the patient the difference between pharmaceutical fish oil and Costco fish oil. They really don't want to pay for their fish oil and I think it's like anything else in the world, you get what you pay for.

DR. SETH BAUM:

There is no question about it. You do get what you pay for. There are a number of different purification processes that go into creating a fish oil product. The most important one is molecular distillation which most fish oils undergo. Fractional distillation is fairly unique process which enables extreme purification of a fish oil. I will tell you from a safety standpoint there are some products that there was only 200 mg of combined EPA and DHA in a 1000 mg fish oil pill. So 800 mg are other things. So clearly that's just not a highly refined fish oil product. Is it going to hurt the patient? I really don't think so, but I think they are going to be getting a lot of excess fat that is just unnecessary and also think that they don't need and it is just not as purified a product.

DR. LARRY KASKEL:

How can you assure that your fish oil has not gone rancid?

DR. SETH BAUM:

The [www.consumerlab.com](http://www.consumerlab.com) for instance looked at that. So in that grouping of 50 they looked for issues of oxidation and they would fail products if there were oxidized end product.

DR. LARRY KASKEL:

So how much is too much omega-3 a day? Is there an upper limit where you say, you know, I don't think you are going to get too much more benefit?

DR. SETH BAUM:

You know, I don't think we know that at this point. I would say for somebody without a medical condition and, you know, there are lots of medical conditions that are now being looked at from an omega-3 standpoint, you know dementias, macular degeneration, and colitis. There are whole bunch of different issues that are being looked at in addition to cardiovascular disease, and arrhythmia, a-fib, VT, VF. So there are lots of things that are being looked at. Let's say, you are just doing it for just general health. I think 1000 mg a day of combined EPA and DHA is fine. If you are going for a true condition, I have seen people use many thousands, thousands of milligrams a day without adverse effects. I am not advocating them, just saying for a condition if you want to go for that, well then you can do that as a physician. Be aware that at those very, very high doses there is a theoretical issue of inducing bleeding diathesis. So you have to be careful.

DR. LARRY KASKEL:

Dr. Seth Baum, Medical Director of the Integrative Heart Care Center in Boca Raton, thank you so much for coming on the show today.

DR. SETH BAUM:

Thank you for having me. It was a great pleasure.

DR. LARRY KASKEL:

My guest was Dr. Seth Baum, Cardiologist and Director of the Integrative Heart Care Center in Boca Raton and we were discussing the importance of the omega-6, omega-3 ratio for cardiovascular disease prevention.

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