A Special Interview with Dr. Cees Vermeer
By Dr. Mercola

DV: Dr. Cees Vermeer
DM: Dr. Joseph Mercola, DO

DM: We're just delighted to have today Dr. Vermeer, who is one of the top researchers in the world in Vitamin K2. This is an emerging powerful nutrient that is really falling short behind Vitamin D as a leading nutrient with so many beneficial actions. We'll go into those in more details with Dr. Vermeer.

Dr. Vermeer, can you introduce yourself and explain to our listeners some of your training and what your specific experience are?

Where are you located? You're overseas, in Europe.

BACKGROUND OF DR. VERMEER

DV: I'm living in Maastricht, The Netherlands. That is a small town in the south of the country.

I got my education in Leiden, the oldest university of The Netherlands. As the youngest one, I have helped start up this university in Maastricht.

In 1975, I founded my Vitamin K research group, which I have continuously enlarged. We started with two, and now we have 12 persons. We are only working on Vitamin K. And to my knowledge, this is, by far, the largest research group on Vitamin K.

I'm a biochemist by training.

I did my PhD in Leiden. I have in my group several PhD post docs. I have a clinical person, along with highly trained technicians. We're collaborating and working on Vitamin K and Vitamin K-dependent proteins. When you say Vitamin K then it's one thing, but Vitamin K has a certain action in the body – that is, it helps activate certain proteins, and you have to be able to measure those proteins to quantify them and see how active they are.
DM: We'll definitely go into that because that's one of the areas that I really want to explore with you, the way to measure your Vitamin K2 and such.

Is your focus of research primarily on Vitamin K1 and K2 or almost exclusively on Vitamin K2?

DV: We started on K1. It was 12 years ago, I think.

Then we discovered the superb effects of Vitamin K2. That was in a collaborative study together with Rotterdam University, where we differentiated between intake in K1 and in K2.

And there we saw that those who had a high K1 intake had normal health. But if the high K2 intake was just selected, then you saw major advantages for cardiovascular health. So those with a high K2 intake had lower cardiovascular mortality, lower coronary calcification and the kind.

DM: Were there any other organ systems that you notice improvements in other than the cardiovascular system?

DV: Yes, of course.

There is also the bone, which very much benefits from high Vitamin K intake and especially again, Vitamin K2. But recently, a German group has discovered that Vitamin K2 also protects substantially against prostate cancer.

DM: That’s exciting because that’s one of the leading causes of cancer in men in the U.S. at least.

DV: Yes, it has been published, I think, earlier this year. It has a massive effect. I think that the highest quartile for intake of K2 had 50% lower prostate cancer, so that is substantial.

DM: From a theoretical perspective, are there any other benefits that you’re speculating or you’re suspicious of?

Many times, it just takes a while to tease out the details and actual studies, but you’ve got a really good idea that there may be some other benefits that are emerging but haven’t been really quantified.

DV: Oh yes.
Now emerging is osteoarthritis and diseases of the cartilage. The first publication was from Sarah Booth from Boston. And it shows that again, high Vitamin K intake has a lower risk for osteoarthritis.

There is one maybe very far-fetched item: the brain. I don’t know what these things are in the brain—maybe something linked to dementia or something else. But we are tracking the brain.

**IS VITAMIN K THE NEXT “VITAMIN D”?
TOOLS IN DEVELOPMENT FOR MEASURING VITAMIN K STATUS**

DM: That’s excellent.

Vitamin D has gotten quite a lot of attention in the media and, certainly, the scientific community. I’ve had an opportunity to interview Dr. Robert Heaney; I don’t know if you’re familiar with him, but he is regarded as certainly one of the major researchers and pioneers in this field.

He specifically told me that 99% of what we learned about Vitamin D was in the last 10 years, and we can relate that to the fact that we had an assay to measure Vitamin D just relatively recently, in the late 90s--it became commercially available.

I’m wondering if you could comment on the state of the field at this point with respect to developing some type of quantitative titer or measure of someone’s Vitamin K2 status.

It seems to me that you have all the best compelling information in the world, but unless you are able to measure it in people in a practical level, it’s going to be difficult to implement and monitor.

DV: Yeah, it’s very good that you come up with this.

Vitamin K measurements in blood plasma or so can be done quite accurately, but the question is whether it’s helpful because it mainly reflects what you have eaten yesterday.

DM: That’s interesting.

DV: There is another way you can do this. You can measure the activity of the Vitamin K-dependent proteins.

**Matrix GLA Protein (MGP)**

Again, we are coming to the area of the vessel wall, which has only one tool to protect itself against calcification: Matrix Glu Protein (MGP).

There are two forms: the active MGP and the inactive MGP.
The active form is made in Vitamin K sufficiency, and inactive MGP is made when you have insufficient Vitamin K intake. If you want to know your Vitamin K status in the vasculature, then you have to measure the circulating level of inactive MGP. We have a patent on the method to do that.

This patent has been also granted in the United States, and this is a very accurate and good method that protects the risk of your arteries getting calcified.

DM: That’s very exciting.

Are there any companies that have commercially made this kit, this assay that you patented, available so that the big labs like Quest or LabCorp can actually make it available to patients?

DV: There are several labs with high interest in this technique.

But, of course, you can imagine that there is a vast amount of money at play here, and we are now trying to select the correct strategy to commercialize this.

Suppose you have a method to screen the whole population for risk of artery calcification!

Another option of this test that’s a little bit different application is that you can more or less quantify the amount of calcium already present in the arteries. So you can do a pre-selection of those who need very expensive techniques like electron beam computed tomography and that kind. You can just take a drop of blood and you can record how much calcium is in the arteries.

That’s unbelievable, but it works.

DM: That’s very exciting.

Do you have any estimates, ideas and projections as to what the cost of this test would be? Will it be something under a hundred, five hundred, a thousand?

DV: The test itself can be made with just like what I call a microtiter plate essay or an automated clinical lab assay. And then we are speaking about, say, prices between 20 and 50 dollars or so. Maybe less, if it scales up.

Lab Test That Predicts Your Cardiac Mortality is on the Horizon

DM: Okay, that’s very exciting.
Do you suspect that the accuracy of this measurement would be comparable to some of the techniques that we have now to measure coronary calcification or arterial calcification, such as stress EKGs or the typical heart scanning that people are using to quantify that?

**DV:** The technique was applied to a group of cardiovascular patients, and we compared those with normal levels of inactive MGP and those with high levels of inactive MGP. It turned out that there was a tenfold difference in life expectancy, mortality or survival, whatever you call it.

So there is a very high potential in this technique.

**DM:** Is that overall life expectancy related to cardiac disease?

**DV:** This is life expectancy to cardiac mortality. In some cases, we have also one cohort where we see, I think, 40% or so overall mortality. It was stunning that it was so large, this difference.

**DM:** Yeah, that’s shocking.

**DV:** Yeah, really.

But whether you can measure, say, coronary calcification as comparably accurate with computer tomography, I doubt it. I think you should use this test as a pre-selection. This leaves the very expensive techniques to those who don’t, and you can help the people much better at a lower price.

**DM:** Yeah, certainly with this economy and worldwide challenges, we’re going to look for far more cost-effective methods to take care of people.

I’m wondering what your projections are as to when this assay might be available. Are you looking into next year or a few years down the road?

**DV:** Between one and two years.

**DM:** That’s so exciting.

With that, I can assure you that we will popularize that test. I think I’m probably, singlehandedly responsible for maybe 50% of the increase in the Vitamin D testing in the U.S. They’re doing a lot of that because it’s such a useful measure. I love these tests that are simple, relatively inexpensive, and can help you really take control of your health. It’s a simple intervention and you can monitor how effective it is.

**DV:** Yeah.
We are also now heading to a home test, so that people can just go to the drugstore and buy it. That should not be too expensive.

And the nice thing here is that you can just make a paper strip or so and see whether it stains red when you add a little bit of blood. If it works with saliva, we still have to see. If you don’t take extra Vitamin K2 that is, of course, the other part of our activity, then you can improve this marker for cardiovascular disease. That means that after two, three weeks of extra Vitamin K2, you directly see with this home assay that you are in a better condition. And that’s important.

**DM:** Just to clarify: at this point in time – in the United States, at least – there’s really no commercial assay other than the one you’ve patented to measure this MGP.

**DV:** That’s true.

**DM:** I thought that was the case; I just wasn’t sure.

**DV:** There is a method at the University of California, I think, but that’s in a university and not for diagnostic purposes. It’s just an investigator who has this assay, and that is not differentiating between the active and the inactive form. So, it is an all-over test.

Of course, the principle of our test is that you compare active and inactive MGP.

**DM:** Excellent.

The major reason to get excited about having a test that can serve as a predictor is that we have a relatively inexpensive intervention. And you’ve mentioned that for over three decades, you’ve been focusing on your research, and clearly you are one of the leading experts in the world in this area.

**THE MULTIPLE TYPES OF VITAMIN K AND BENEFITS OF EACH**

**DM:** So I’m wondering if you can help our listeners understand some of the benefits of the vitamin K2 that we mentioned and maybe go into a little more detail.

But before you do, let me preface to say that this is an area that most people don’t understand clearly. It’s really the astute student of natural medicine that will recognize that there is a difference between vitamins K1 and K2.

And that’s about as far as they get.

But when you get to K2, there is another even more important differentiation, which is between the types of K2: MK7 and MK4, the two big ones. I really want to get your opinions on this, and I’d like to focus most of the attention on it so that we can develop a
better understanding and appreciation of a therapeutic intervention to change this MGP protein.

**DV:** MK4, in fact, is a synthetic product. It’s very similar to K1. That means it has a short half-life.

After being taken to the intestines, it goes to deliver to and stays most of the time in the liver, where it is useful in synthesis of blood-clotting factors. The MK7 is in a supplement that is extracted from a Japanese food called *natto*, while MK8 and MK9 are from dairy—cheese mainly.

These things are incorporated in what is known as LDL or low-density lipoproteins.

LDL is carried from the liver to the vessel wall, where there are receptors to take it up. So this MK7 is very efficiently transported from the liver to the place where it has its beneficial activity.

You also have to know that the half-life of MK4 is about one hour.

The half-lifetime of MK7 is three days.

That means that there is a much better chance to build up a constant relatively high level of MK7, compared to MK4 or K1.

**Vitamin K Dosing**

**DM:** Just from a cursory review of the literature, it seems that most of the initial research was done on MK4. Then the newer stuff is MK7, which you or your co-workers probably did a lot of research on.

From your perspective as the expert, is it reasonable – even though there is a much shorter half life – to give someone MK4 on a more frequent basis, three or four or five times a day and expect to get similar results as MK7? Or is it that MK4 is really much closer to Vitamin K1 and you’re not going to see those benefits?

**DV:** I think that K1 (MK4) can, of course, do the same trick as MK7, MK8, and MK9. It’s only a matter of dosage. You have to apply very high doses of K1 and MK4 to see effects comparable to MK7.

In experimental animals, for instance, we see that they calcify when you give them 1500 mcg of K1, whereas they really don’t calcify with only one microgram of MK7. That shows the huge difference. But, of course, the Japanese give their patients 45 mg of MK4. You load the body with this.
All these K vitamins have the same function, which means that in the end, you will have a comparable effect. It’s just a matter of dose--but then you use the vitamin as a drug and not as a vitamin.

We try to stay in the nutritional ranges.

**DM:** Physiological ranges.

This is a very important question because it’s really a philosophical approach, and I’m glad you brought out the distinction.

From your perspective, obviously, it seems like you’re going to get similar benefits.

But are there any dangers or concerns with going to something that’s so outside the typical dose that one would experience in nature? To me, it’s intuitively common sense, and you would expect that that there might be. I’m wondering if you have some concerns, or if you’ve seen any observations in the literature that address this.

**DV:** It is very clear that Vitamin K has no harmful effects, whether you give it to healthy people or to patients.

**Cautions With Coumadin**

There’s only one exception, and that is the patients on Coumadin. Coumadin is a drug that’s meant to keep your blood thin and to anticoagulate patients. Coumadin is an anti-Vitamin K, so if you give extra Vitamin K, then you counteract the effect of the drug. So you shouldn’t do it with MK7 and with K1 and MK4.

You can imagine that if you give those huge doses to patients on anticoagulants, then you run into problems.

But there is a possibility to give the MK7 in relatively low doses so that it is beneficial to the general population and not harmful for those who are on oral anticoagulant treatment. In fact, there have been publications saying that you get a much more stable way of anticoagulation if you would combine MK7 with the Coumadin therapy.

**DM:** Interesting.

So by combining it – and perhaps you can mention the doses that you recommend to someone on Coumadin – you’re not going to impair the lowering or the elevating of the prothrombin time to prevent the clotting ability. But you’ll still get the benefits of the Vitamin K2 on preventing osteoporosis and cardiovascular disease.

**DV:** I don’t know at this time if during anticoagulation or Coumadin use you will have the same preventive effect against cardiovascular calcification.
I do know that if you use a dose of about 45 mcg a day of MK7, you don’t seriously interfere with the therapy. So, those people may not benefit from it. Anyhow, they are not at risk of harm. There’s no any harmful effect.

DM: I just want to make sure that I understand what you said completely on an earlier question.

Because of the relative innocuous or benign nature of Vitamin K – even at these huge physiological doses that seem to be far outside what one would experience in a normal environment, and from your understanding and review of the literature – there’s really not any harm that you are aware of, outside of Coumadin therapy?

DV: Exactly.

**Vitamin K and Osteoporosis**

You have to realize that in Japan, menaquinone 4 is used 45 mg per day as a drug in tens of thousands of osteoporotic women. It is their drug against osteoporosis.

DM: Is it more commonly used than the –

DV: I would say bisphosphonate. I think you should use bisphosphonates maybe in combination with MK4, but not MK4 alone. I think bisphosphonates are far more powerful. But we have done a similar study as the Japanese with also a very high-dose regimen and for three years among 350 women. We have not seen any adverse effects.

DM: What type of doses were you using?

DV: 45 mg a day. Also at a very high dose. We have specifically investigated blood clotting, and there is really no deviation in it. It’s harmless.

DM: And that’s the total dose per day? So it would be like 15 mg three times a day that you’re using?

DV: Yeah, that’s it exactly.

DM: Excellent.

You mentioned the study in osteoporosis and your use of MGP as a Vitamin K parameter or index. Another functional protein that Vitamin K2 affects is the osteocalcin. Besides MGP, is there an assay that looks at that to measure Vitamin K status?

DV: You measure the Vitamin K status of the bone, and this assay is commercially available. It’s from a Japanese company Takada, and they send it out for research purposes only. It’s not for –

DM: It’s not commercial.
DV: It is commercial, but only for investigators and not for the routine doctors.

DM: It would seem intuitively that there should be a correlation between a sufficient osteocalcin level and an MGP, because it’s due to the same factor--Vitamin K2 status.

DV: It just depends, of course, at how efficiently the tissue can take up the Vitamin K. It could be that bone takes up Vitamin K more efficiently than vessel wall. Maybe that sounds a bit strange, but it’s true. The vessel wall doesn’t have so many capillaries that supply it with blood itself. It guides the blood clots. But it’s just like a pipe, and when you look at the tissue, it is completely white and it doesn’t contain so many small blood vessels for its own benefit.

So the uptake by the blood vessels is not that easy, I think.

Two Forms of Vitamin K Compared: MK4 and MK7

DM: I’d like to go deeper with the MK7 versus the MK4 again.

It seems the biggest issue is this absorption. Can you explain why you need such a large dose of the MK4?

Is it that the MK4 isn’t absorbed well and the MK7 is?

Is it solubility? What do you think is going on there?

DV: In food, you have the food matrix that can have a major difference. But if you compare the pure compound – the salt and oil or whatever – and you take or ingest it, then you get absorption, which is comparable for K1, for MK4 and for MK7.

I think that in the liver, you will see comparable levels of all three at the start.

But then the liver will start secreting the MK7 and retaining the K1 and MK4. MK7 is more lipophilic; it is more in the fat fraction. It is incorporated into LDL, and K1 is not incorporated so well. So, that is the transport vehicle.

And I think the liver just uses the MK7, MK8, and MK9 to supply what we say are extrahepatic tissues with vitamin K.

DM: You mentioned these other forms of the MK7, MK8, and MK9, and probably others, too. Is there a danger of using an isolated extract?

I think you have actually been instrumental in developing some of these MK7 preparations, but is the MK7 exclusively MK7? Is it isolated extract, or does it have
these other components that are part of what is also seen in its natural form, like the MK9?

**SAY CHEESE!**

DV: It’s bound to carrier. So it’s not pure, but it contains MK7 almost exclusively.

There is a little bit of MK6 in it because it is produced by Bacillus subtilis natto, and that is a bacteria growing on soybeans. This bacterium makes MK7 for its own benefit. It uses it but also makes a little bit of MK6 that is a little bit smaller but has the same active group.

So it’s very comparable.

That’s what’s in the MK7 preparations. The MK8 and MK9 are very interesting for the dairy industry, mainly for those who make cheese and curd cheese. You know what this curd cheese is, cottage cheese?

DM: Sure, absolutely.

DV: Okay. These products contain a relatively high amount of menaquinone 8 and 9. That’s also vitamin K2.


DV: Oh yes.

If you take 100 gm of cheese, you eat the same quantity of Vitamin K2 as what you get from a supplement pill normally marketed as the 45 mcg. So, 45 mcg is normally what is present in 100 gm of cheese or curd cheese.

DM: Is that the major source – other than natto – of the Vitamin K2?

DV: Yeah.

Well, it’s not extracted, of course, from cheese.

DM: Right. It’s part of the food product.

DV: And if people don’t want to buy the supplement pills because they say, “I don’t need pills. I eat healthy,” then I say, “You should eat curd cheese because regular cheese is pretty fatty. It contains a high amount of animal fat; it’s saturated fat. That component is not so healthy. If you take curd cheese, even the food fat curd cheese has is much less fat than regular cheese.”
These days you have skimmed curd cheeses, which are very good, tasty, and creamy when you taste it. So, I prefer the skimmed curd cheese, and that contains a high level of K2.

If you take 100 gm of curd cheese every day, then you get your Vitamin K2 supply to the same extent as what we found prevents 50 percent of the cardiovascular mortality.

DM: That is just a shocking observation.

I don’t think I’ve ever seen, heard or read that. Maybe it’s just my negligence, but that is a really powerful observation. That’s amazing!

DV: It’s by combining two of our papers and you see (1) the food content and (2) the observation about Vitamin K2 in those who experience a lot of cardiovascular mortality and those who survived.

DM: Just a few questions on it because it’s such an important point.

What is it in the production of curd that doesn’t really occur in the manufacturing or the production of traditional cheeses?

DV: Both in traditional cheese and in curd cheese, it is to the same level that you grow your K2. And that is because of the starter ferment. It contains certain bacteria – lactococci and propionic acids bacteria – that produce the K2. Again to their own benefits, but when we eat those bacteria, we ingest what they have made. And that is K2.

DM: Oh, that is excellent. That is just really good.

DV: Yeah.

This is very important for the dairy industry because you can imagine that they are willing to improve the K2 production by the ferments. So, they want to have better ferments.

Mum’s the Word

DM: Have you investigated as to which specific species are the most potent at producing this K2?

DV: No.

Well, we do some of that work, but I cannot talk too much about this.

DM: Okay. So, you’ve got a product in development.
DV: Yeah.

DM: Well, that’s exciting.

Is this product going to be something that the commercial dairies use, or is it designed for the consumer who is going to be taking this as a supplement?

DV: No.

We have the supplements on one hand, and then we have the functional foods on the other. The supplements are mainly MK7, while the functional foods will also be MK7 that is mixed with MK7 powder or so.

The other part is then the MK8 and MK9, and that is the curd cheeses. Of course, they will also find bacteria in yogurts, for instance. That will make yogurt K2-rich.

DM: Wow. That is just amazing.

So when do you project to have that product available?

DV: I don’t have the product available. That’s the dairy industry, and that’s why I can’t talk too much about it. But I expect that these products will come on the market maybe next year or in the year after that.

DM: So, relatively soon.

DV: Yeah. I think so.

DM: Probably in conjunction with the time that the MGP test will be available.

DV: Could be, yes.

VITAMIN K ABSORPTION

DM: It’s a nice coincidence.

Is there anything that can be done from a supplement perspective to actually improve the absorption—like nanosize these particles so that they will absorb more efficiently and you need less of a dose? I’m just not familiar with the physical biochemistry of it.

Is it a large molecule, or are there some other variables that prevent it from being absorbed?
DV: No.

Vitamin K is a rather small molecule, only it is not soluble in water. So you need fat in the meal.

Capsules are always in certain oils (sunflower seed oil) so you can easily dissolve your Vitamin K. You also need in the intestines a certain bile excretion. Of course, when you eat or ingest a meal, it is a little bit fatty. There, you have sufficient bile production. In the intestines, you have myocele in which this Vitamin K is incorporated pretty easily.

Then it is just transported through the wall of the intestines into the lymph and into the blood stream, until it reaches the liver.

THE IMPORTANCE OF VITAMIN K TO YOUR BONES AND HEART

DM: Excellent.

At the beginning, you reviewed the benefits of the Vitamin K2 and talked about the cardiovascular and bone benefits and the likelihood that there are some emerging brain benefits that we’re just beginning to explore.

Could you be more specific on that?

DV: No. The brain?

I cannot be more specific on that.

DM: You may pick out the other ones like the cardiovascular and bone-related ones, and maybe put into a proper perspective your understanding of the benefits of K2 versus other similar interventions such as lowering cholesterol or doing exercise to increase bone density.

This is just to give the listeners a perspective on the relative importance of Vitamin K2 as intervention. They need a barometer to assess that.

The Dancing Trio: Calcium, Vitamin D and Vitamin K

DV: Okay.

I think that the Vitamin K2 will never do the work alone. You also need other health measures.

One of them is Vitamin D. The two collaborate; there is a synergistic effect of Vitamin D and Vitamin K.
This MGP is synthesized in the vessel wall, but its synthesis is increased by Vitamin D and its activity is increased by Vitamin K. So, those two work together, and that’s also inborn. So, if you’re working on bone health, never do Vitamin D and calcium alone; take in Vitamin K as well.

There is another aspect in that respect.

If you give a high dose of calcium to, for instance, post-menopausal women, then you give an extra calcium load to the body. There is a publication about a pretty large cohort of women taking extra calcium and getting a lot of cardiovascular mortality.

I think that increasing the calcium load in the body is good for the bones. It is demonstrated to be good for the bones, but it’s also bad for the blood vessels because they get calcified. You have to protect the blood vessels, again, with extra Vitamin K so that you can give the MGP the maximum activity in its calcification inhibitory activity.

**DM:** Well, thank you for explaining that.

I’m still curious about the K2 benefit that you observed.

Let’s assume that a person is taking Vitamin D, has a healthy lifestyle, is doing strength training exercise, and taking all the other accessory micronutrients that we know from a bone health. What type of benefit do you see in two groups doing that – one is taking K2 and the other isn’t?

Can they even get close to maximum bone density without the K2?

**DV:** This is a difficult question at this stage of the research.

What was calculated in what we call the Rotterdam Study (the first study demonstrating the beneficial effect of Vitamin K2) was that the life expectancy of those who had 45 mcg of K2 intake was seven years longer than those in the lowest quartile, and that was 12 mcg per day.

So, you can live longer.

In a subsequent study that came later (the Prospect Study) and was from people we did not collaborate with, there was an independent study of 16,000 subjects who were followed for more than 10 years. They calculated how much benefit you have from 10 mcg K2.

It turned out that each extra 10 mcg K2 in the diet gave 9% less cardiovascular events.

**DM:** Yeah. It is a very significant benefit.

**DV:** If you have 45 mcg in your supplement, it means almost 40% less risk for cardiovascular events.
DM: That is a profound benefit.

My personal bias is to take a nutritional approach, and I think there is probably, generally speaking, less risk and perhaps more benefit because you get the whole supplement and its other accessory nutrients.

But if one chooses to use supplements, can you just give our listeners an idea of the cost of choosing MK7 even at the high doses with the 45 mg that you and the Japanese looked at, versus the MK7?

DV: Okay, 45 mg of MK4.

I do not know if it is available in the United States. Not in Europe, anyhow. This is so high. I think it is only in Japan that you can buy it in that way.

DM: Okay.

DV: What I can say the cost of MK7 here at a drugstore is around $20 for 60 capsules for 60 days. Two months is $20, so that is $10 per month.

DM: So, relatively inexpensive.

DV: Yeah.

Well still, they regard this as pretty expensive if compared with Vitamin D, for instance, which is very inexpensive. Here there’s a vitamin that is coming into the market, and there is a huge amount of research, which also has to be paid, of course.

Our research has to be paid; it is paid by the company, NattoPharma, who is marketing this material. So, it is more expensive than Vitamin D.

DM: And NattoPharma is a company that you are working with to produce the MK7?

DV: They import it from Japan.

DM: Yes.

Is that the only company that is producing MK7 in the world?
DV: No, that’s not true. There are others, but I do not know about the quality. We have checked the quality of the NattoPharma product regularly because we use that product in our studies. The others we have no idea about.

DM: Okay. You haven’t looked at them, so some others might be good but you just have not had the opportunity or the chance to see.

DV: No.

DM: Do you have any suspicions?

Is there anything that NattoPharma is doing that would make their product better, or is it just that they were the first to market?

DV: First, I think they have a good source. The Japanese know how to make it. Of course, after you have extracted it and you have put it in a capsule or whatever, is it better than others?

You proceed to the contaminants. The NattoPharma product is checked for whatever contaminants or bacteria there might be. I do not know if that’s how it is with the others. I am not in the product quality control of all these.

Are All Vitamin K Supplements Equal?

DM: Sure. We’ll stick to the biochemistry then.

I know that with Vitamin D, there really isn’t a major difference between most of the manufacturers.

We have Vitamin D3. Vitamin D3 is Vitamin D3. It does not really matter whom you get it from. It is really inexpensive.

Since it is a similar vitamin, I am wondering if it is the same situation there. With a lot of other supplements, that is not the case, and you do not pay attention to many of these different variables. You are going to have one that’s grossly inferior to the other.

DV: Yeah.

At this time, the product from the market is only a natural product extracted from all kinds of biological materials. Then you can expect, of course, some differences in terms of purity or contaminants or whatever. At the end, I expect that MK7 will also be produced as a synthetic form, and then we come up with 100% purity.
DM: Interesting.

DV: Then you can add it as a pure compound, and you don’t have to have all those other things. But it will take some time before you have synthetic menaquinone 7. It’s not so easy to synthesize.

DM: Yeah.

What are your projections: 5 years, 10 years?

DV: I think 5 years.

DM: 5 years.

DV: I do not know how it is with the regulatory aspect. When you have a synthetic product, maybe you have to go through a whole dossier and file it to the FDA, do toxicology studies and whatever.

I am not familiar with that so much.

DM: It may be a bit longer. So it’s just a rough guide.

Now, you mentioned earlier that MK4 is completely synthetic. Was there ever a natural form of MK4? Is it just something that was created in the lab to replicate Vitamin K2 activity?

DV: No.

In fact, MK4 is present in our bodies also as a natural product to a very small extent. The body is capable of converting K1 into MK4. We don’t understand why it is done, but it is done. We have a rough understanding of how it is done.

Most of the MK4 in our body comes from animal products.

In animal feed, you have a product called menadione. That is a very synthetic, strange form of Vitamin K. It is a bit toxic, but for animals, it’s not so bad; many have poultry or pigs getting a little of that. They use it to protect these animals against breaking the bones.

This is especially important for poultry so they don’t break the bones during transport. They get menadione, and these animals can synthesize menaquinone 4 from the menadione. Then you eat the animals, and you get and ingest a bit of the MK4 that is already in the animal.
DM: Okay. I will ask you one last question.

I'll respect your time and hopefully, we can talk again. You had mentioned the synergism between Vitamin D and Vitamin K. Those are both water-soluble vitamins. The other primary one, of course, is Vitamin A, and I am wondering if you have noticed any similar synergies between the A and the K?

DV: No, definitely not.

DM: Really?

DV: No.

DM: Interesting.

DV: Completely different.

DM: Because there seems to be a profound interaction between the A and D, and I thought it just seems like there might have been one with A and K.

DV: No.

With Vitamin K, we know so exactly the place where it works on enzymes. It is co-enzyme--a very definite enzyme--and we just know exactly how it works. It does not interfere with Vitamin A.

DM: Excellent.

Well, I want to thank you for all that you're doing. I will definitely connect with you to have some follow-up questions when our schedules coincide. You've been most gracious with your time, and you've done tremendous research that is going to benefit large amounts of people.

One of the purposes of our site is to speed up the time at which this useful information could be applied at a broader level, so people can benefit and not have to wait for decades before the life's work of brilliant researchers like you reaches them.

DV: Yeah. We in The Netherlands have a proverb. We say, “Our noses are pointed at the same direction.” So, we are collaborating together to get these things as a benefit for the people.

DM: Absolutely. I thank you for your time, and we will be in touch at a later date.

[END]