An Interview with Rod Benjamin of Bergstrom Nutrition

By Dr. Joseph Mercola

DM: Dr. Joseph Mercola

RB: Rod Benjamin

Introduction:

DM: Welcome, everyone. This is Dr. Mercola, and today we’re here to discuss a topic that is becoming progressively more recognized as a really important tool in optimizing our health. That is the clinical use of sulfur as an adjunct in our diet. Certainly, diet is one of the primary main tools that I advocate for optimizing your ability to reduce your risk for chronic degenerative diseases. But the practical question becomes, how do you obtain that sulfur?

In an effort to provide another resource, joining me today is Rod Benjamin, who’s the director of technical development for Bergstrom Nutrition. They are based out in Vancouver, Washington. They have the world’s only GRAS-designated proprietary and patented MSM. We’re really excited that Rod could join us today and provide us with some insights into this really important topic. He’s been doing this for quite some time, as you’ll find out, and has acquired a wealth of information that he’s excited to share with us. So, thank you for joining us today.

RB: Thank you, Dr. Mercola.

DM: I think the central crux that we’d like to discuss is the use of sulfur. But before we get into MSM, which you’re heavily involved with, I’d like to sort of help people understand how you got to this point.

Because the MSM is a form of DMSO, it’s a similar type of product. I first became aware of DMSO decades ago. I mean, 60 Minutes has been on for at least 40 years. I think there was a 60 Minutes [episode] with Stan Jacob in the 70s.

RB: Correct. Yeah.

DM: They used DMSO. At that time, it was really controversial, certainly in the veterinary medicine. They were using it very successfully for thoroughbred race horses. They were applying it topically, and they were getting phenomenal results. So phenomenal and fantastic, that 60 Minutes actually filmed a segment on it.

That was how I first became aware. It actually far predated my entrance into medical school. I’m wondering if you could help expand on that and sort of set the stage, so we can have the discussion on MSM.

RB: Dr. Jacob actually was very interested in DMSO. It had been used as a therapeutic compound in race horses and allowed them to go back onto the track faster. It supported their
soft tissues, helped with muscle soreness and soft-tissue injury, actually helped pulmonary or lung function.

DM: And when did he figure that out? He found that in the late ‘60s or so?

RB: Yeah. Late ‘60s and into the early ‘70s.

DM: Are there any specific race horses that he actually used it with that got results? Or was it just generally known within the industry? How did 60 Minutes find out about it?

RB: That was actually, you know… It was used in the race horses. But you have to remember that Stan Jacob is a medical doctor.

DM: Right.

RB: What he’s interested in is knowing about how it had been used in veterinary medicine for supporting these race horses and whatnot.

But another interesting this about DMSO is the temperature that it freezes out is about 65 degrees Fahrenheit. Dr. Jacob had been very deeply involved in looking at cryogenic preservation of tissues and organs for transplant. Through his knowledge – here’s a substance that seems to be very low toxicity, because it’s being used in race horses and whatnot, but it also has these other properties that would allow it to be frozen.

Now, if you were to freeze organs and things in water, you actually get rupture of the cell membranes. That damages the cells and the tissue and makes it so it’s not able to be transplanted.

He started looking at DMSO from that – for that reason. Along that line, he found that he was able to freeze organs and thaw them back out with a very minimal damage. But along that line, they had really evaluated the toxicity of this. What are the potential side effects if you were to put an organ that has been preserved in DMSO into someone? It’s they’re going to have a fairly large amount of DMSO in the body. And what are going to be the effects of that?

And really, a lot of the pharmaceutical companies that were in business at that time – the top five – actually started doing extensive research on, like I’ve said, it started out as toxicity studies. But then, they started finding that there were some very interesting therapeutic advantages to using DMSO.

DM: Benefits.

RB: Yeah, definitely some benefits being seen. That basically led to tons of research. They say DMSO could be one of the most researched drugs out there today.

DM: Do they classify it technically as a drug now?

RB: DMSO is classified as a drug within the United States.

DM: Do people need a prescription to get it? Because many people use it, but they just buy the veterinary product and then apply it topically. How does that work?
RB: They do it… Regulatory-wise, actually, DMSO for human usage must be obtained by prescription.

DM: Okay.

RB: Now DMSO is available. You can buy it at a lot of veterinary supply stores and things like that, but it’s not to be used for humans, okay? It’s also a great industrial solvent. That’s how they kind of sell that. It’s a little under the radar there.

DM: Well, getting back to the veterinary uses, what are the benefits that are noticed in animals? I mean, is it actually reducing swelling, inflammation…

RB: It’s reducing inflammation.

DM: Arthritic types of conditions?

RB: Yeah. Exactly. Primarily, anti-inflammatory and reduction of swelling. It’s actually used for a lot of things. It improves or seems to improve cell wall permeability. It also can be used to help deliver other active ingredients.

DM: And actually, I use that clinically myself. Because as you mentioned earlier or alluded to, it’s a phenomenal solvent, and that it does have the other ability to penetrate your skin and transfer right directly into the bloodstream. It can also take with it anything that’s dissolved in it.

RB: Right.

DM: Many people may not know that vitamin B12 is the largest vitamin out there. As a result of that, you don’t absorb it very well. You can swallow it. But unless you have a really functioning, highly-functioning intrinsic factor system, you’ll develop something called pernicious anemia. But essentially, you need that intrinsic factor to combine with vitamin B12 to absorbed. Without it, it just passes right through you. Many people, as they age, lose the ability to make intrinsic factor, which is why they develop an anemia called pernicious anemia.

As a result, many people inject B12. Or you can use sublingual sprays, but sublingual sprays are relatively new innovation. A while back, what we had done was dissolve the B12 in the DMSO. You would apply the DMSO on your skin. It would take it right through, right into your bloodstream, essentially getting the benefits of an injectable B12 without the hassle of the needles. It’s just another potent demonstration of one of the benefits of DMSO. It could be used as a carrier vehicle to introduce substances into the bloodstream.

RB: Correct. That is my say. But as far as the way a person using it for that purpose, you have to be very careful, because it does take things directly in the bloodstream and…

DM: Well, it could also take the dirt or any toxins you might have in your system.

RB: Exactly.

DM: It will take them right through. You have to make sure it’s on clean skin. Or it would take the soap used to clean your skin right through your bloodstream.
RB: Exactly. That’s why it’s best to – in using it in that manner – do it under a doctor’s supervision and what not.

DM: It’s a really interesting substance.

RB: It is. Dr. Stanley Jacob, as you’d mentioned, one of the interesting things…This is something… I’m talking about the 60 Minutes interview that he said he has one main regret on that interview. It was he talked about MSM – or I mean, DMSO has a wide variety of uses.

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He said it wasn’t well-received per se by the pharmaceutical or drug industry at that time, because they had a very much of a singular idea or focus for therapeutic agents. In other words, you have one thing that’s wrong with you. You take one drug for this one thing, or maybe one drug or medicinal entity to address, you know, five different things.

But he said DMSO – and MSM together with that – in his opinion is much more of a therapeutic principle. It’s similar to exercise or proper nutrition. Instead of that singular focus that is so prevalent within the drug or pharmas per se, it’s much more of a therapeutic principle, which is overall body wellness.

DM: Which strongly suggests that it’s providing some missing link. Maybe you can expand on that, because it appears that the missing link might be related to sulfur. Sulfur is just becoming more widely appreciated, and that we have a decrease of that in most people’s diet. It’s certainly such an important critical role, especially in detoxification and also in inflammatory conditions. For detoxification, sulfur is part of probably one of the most important antioxidants that our body produces, which is glutathione.

RB: Right.

DM: Without sulfur, glutathione just can’t work. So, maybe you can touch on some of the components of how it works, or at least Dr. Jacob’s or your impression, as to DMSO/MSM. Talk about the connections between DMSO and MSM.

RB: I’m going to go back to the part of DMSO that I’d mentioned, where they found that a lot or approximately on average 15 percent of any DMSO dosage that you take converts to MSM in the body. This huge plethora of research that was done on DMSO and those therapeutic properties begs the question: how many of those therapeutic properties are due to the DMSO? Or are they due to its metabolite, MSM, once it’s been converted in vivo or within the body?

Now, in that, sulfur, as you mentioned, is very important. It’s in over 150 different compounds within the body. It’s virtually sulfur’s component of every cell within the body. It’s extremely important. Now, as far as MSM’s role within the body, it’s very complicated. And I will say that it’s not a hundred percent understood. I’ve been working with this compound for 16 years to try and answer that question. We understand a part of the mechanism of action, but not all of it.

We have pharmacokinetic studies and pharmacodynamics studies that actually look at… Basically, that’s to determine once you take MSM (these were basically oral studies), what
happens to it? Where does it go? How long does it take to get into the body? How long does it remain in the body? And where is it dispersed?

DM: But is there research supporting that it actually is a valuable source of sulfur? Any tagged studies with radio isomers?

RB: That’s where I was leading to with that. It’s that there’s been radiolabeled, where you take a radioactive tag, put on the sulfur itself, and put it into the body. Actually, in 1986, Richmond did a study on that, and it showed that it was taken up into serum proteins. That sulfur was actually incorporated in the serum proteins.

We also have done [something] like the pharmacokinetic study, which showed that radiolabeled sulfur was taken up into hair, skin, and nails. Keratin is a very high sulfur-containing compound, which is a building block for your nails and your hair. But it also showed up in almost all tissues, spleen, and liver. It went all over.

But the interesting thing in that was we were looking at the radiolabel on the sulfur. I believe that it does give up the sulfur. We’ve seen that, for instance, for human clinical trials now, there’s been shown a decrease in homocysteine levels when supplemented with MSM versus a placebo.

But the interesting thing is we did – and this is why I say it… It’s complicated. We did a study where we said, “Okay, let’s give it to healthy human volunteers.” We did actually three different dosages – one gram, two grams, and three grams. We measured urinary sulfur output by measuring sulfate, thinking that sulfate will be a waste sulfur product that would show up excreted in the urine.

Yeah, we did the different doses to see if it was in a dose-dependent manner that we’d be able to correlate back and, say, “Yeah, MSM is giving up at sulfur. It’s coming out, you know, more.”

We found that they were indeed dose-related, but the interesting thing was it was inversely related. The more MSM you took, the less sulfate was excreted in your urine. What that says is it’s much more complicated than just a strict sulfur donor. It is affecting the compartmentalization of sulfur and sulfur metabolism within the body. That suggests that MSM is actually allowing better metabolism, better incorporation of the sulfur throughout the body. It’s not just a simple sulfur donor, but…

DM: Well, let’s just clear up some of the transition from MSM to DMSO.

RB: Sure.

DM: Because DMSO, it predated MSM.

RB: Correct.

DM: I mean, that was the original application of this technology. It has some other benefits as you mentioned. It seemed to be useful in cryogenic preservation of tissues, which MSM doesn’t do.

RB: No.
DM: But it appears, and maybe to this day, strongly suggests that the bulk of therapeutic clinical benefits was related to the fact that about 15 percent of it was converted to MSM as a downstream metabolite.

The downside of using DMSO – even though it’s not legal to use it for humans, many people wind up [doing so] because there’s an easy work around, you can buy it in the veterinary supply store – is that you’re going to have quite a significant odor. It’s really offensive to many people that you’re around with. It’s not too dissimilar with taking very large amounts [inaudible 17:22]. They’re probably even worse than that.

RB: Right.

DM: It seems that the contemporary version of DMSO, at least in humans, is MSM, which is legal in humans. For those who like to know the chemical name, MSM is an acronym that’s short for methylsulfonylmethane.

RB: Correct.

DM: It’s obviously much easier to say MSM. That’s why we say MSM. But in case anyone’s wondering what that stands for… It is not to be confused with MMS, which is another product. But MSM – the nutritional product.

So, why don’t you tell us how you first became interested in it? Because you’ve been doing this for about 16 years, just before the turn of the century. Was that in any way related to a connection with Dr. Jacob?

RB: Well basically, I was always interested in DMSO, because I was born and raised in Pacific Northwest close to Portland, Oregon.

DM: Okay.

RB: And then I can remember, actually as a kid, newspaper articles about DMSO. I can remember thinking that. You know, you have to remember that as a child, you have limited actual understanding of what’s going on.

DM: Sure.

RB: But it was like, I read about DMSO, and I was like, “Wow! There’s this new super drug that’s been discovered. Wow, it’s like the cure-all of everything.” Actually, for a while, it was kind of promoted as that. There were some issues with FDA about that.

DM: This was prior to the FDA reclassification?

RB: Yes. This was the one that first came out. It was in the local papers, of course. Growing up, I was like, “Wow, that would be so neat, to be able to discover something that would be so beneficial and so helpful to overall health and wellness of people.”

It’s funny I wanted to be a scientist from the time I was a very small kid. Then I was just thinking, “Wow, it would be so neat,” because I really kind of thought, well, there’s not that
many new things to be discovered out there as we continued to progress. I remember thinking about that.

It turns out that the founder of the company that I work for, he worked with Dr. Jacob and was learning that. When he formed this company, I had went on and became a chemist. He actually contacted me and asked me if I’d be interested in coming to work for him. It was kind of interesting, kind of [inaudible 19:57] or something. DMSO is related to DMSO, something that I had been…

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DM: Or MSM is related to DMSO.

RB: Right. His company manufactured the MSM. He asked if I’d be interested in coming to work for him. I have to say where I had second guess on – that was I was working for a company that made hundreds of different compounds. And here, I was going to work for a company that made one and only one thing. But I did it and…

DM: Which gave you a chance to participate in one of your childhood dreams.

RB: Exactly. It has not disappointed me, because the more we learn about it, the more amazed I am.

DM: Why don’t you highlight some of the more recent clinical studies that tend to support some of your initial excitement and enthusiasm that have probably even increased it further?

RB: Yeah. Well, as I was, you know, interested a little bit. If I can talk just a little bit about how MSM… Originally, I want to work there [because] DMSO, it was like, “Wow, it’s good for all of these different things.” We kind of knew that going on. There was a lot of anecdotal evidence. In other words, people have tried it. Dr. Jacob had used it for treating patients for all kinds of different maladies.

DM: DMSO?

RB: DMSO and MSM.

DM: Okay.

RB: What he did (because of the disagreeable odor), he started diluting DMSO with MSM fairly early on, because that would minimize that disagreeable odor and taste.

DM: How did he apply it? Topically still?

RB: Actually, it was being used intravenously or topically, depending on the specific condition that he was trying to treat. He would play around with the DMSO-MSM ratio, depending on… I mean, if someone was extremely sensitive to that taste and odor of the DMSO, he would scale back the DMSO, increase the MSM, and treat them that way to minimize that disagreeable [odor].

DM: He realized early on that MSM may be one of the important components here?
RB: Yes. Yes, very early on. He used it a lot for that. But we focused very early on, saying, you know – this was actually part of Dr. Jacob’s advice to us: “If you go out there and say that this is good for all of these things, people are going to look at you like you’re a snake oil salesman.” That is kind of the mentality.

But as we continued to research it, we found – tying into the mechanism and what it actually does – how it could indeed be useful in a number of different areas. We started looking at some of the latest research. Within the last two years, there have been at least four human clinical trials on MSM and its ability to help with exercise recovery. Basically, that ties back to oxidative…

DM: Would that be related to the muscle injuries like DOMS, delayed onset muscle stiffness or soreness?

RB: Yes. And actually, in one of the studies, they were looking at the VAS pain scores. That’s muscle soreness due to exercise. There was a significant reduction in the MSM-treated group versus placebo. That’s directly tied to the muscle soreness.

But more than that, it looked also at… There was a study that looked at creatine kinase (CK) and lactate dehydrogenase. Now, these are enzymes that are produced from muscular damage. Like CK, that’s an enzyme that they’d look at if you have a heart attack. So, large muscle injury.

This was actually done in healthy human volunteers running a 10-kilometer race, and then they measured the CK afterwards. You’re talking large muscles damaged, because they weren’t properly conditioned. They’re going out. They’re running this marathon. Then they measured the CK (that’s creatine kinase), post-run and found that MSM significantly reduced the CK. It protected the muscles from that.

Now, it appears – and there have been numbers of different studies looking at this – that it protects from oxidative damage. You’re looking at... And of course, now we start getting into the different markers. I don’t want to go there, because that gets pretty technical – you know, MDA, protein carbonyls, and things like that. But they measured these markers of oxidative damage, cellular damage, done by oxidative stress. MSM does seem to protect that.

Now, you’ve mentioned glutathione. They also have – both in animal model and human models – these researches showing an increase in glutathione. But even on top of that, glutathione has two different states within the body. There’s reduced glutathione and oxidized glutathione. The ratio of those two talks about the overall oxidative status or the ability of the blood plasma to address oxidative stress. MSM did improve that overall ratio. In other words, you have much more reduced glutathione that’s able to deal with these free radicals and whatnot.

If you start looking at that, you have oxidative stress controlling that. Well, oxidative stress can lead to inflammation. Inflammation leads to more oxidative stress. It’s a cyclical type of thing. Even in the Wall Street Journal… The New York Times fairly recently has put out articles talking about low-level chronic inflammation and its potential role in chronic disease like, for instance, diabetes, cancer, vascular disease, and things of that nature.

That’s, I think, kind of the key of how MSM really – and DMSO also does the same thing – by controlling that oxidative stress or protecting from the oxidative damage can have these therapeutic [benefits].
DM: Glutathione is an endogenous antioxidant. That means our body makes it. MSM by itself is not an antioxidant.

RB: No.

DM: It seems to work by improving the body’s ability to make its own antioxidants.

RB: Correct.

DM: Now, there are exogenous antioxidants that are found in nature that are really potent also. The one that comes to mind most obviously is astaxanthin, which seems to be the premier new antioxidant of the 21st century. I’m wondering if you’re aware if there are any studies that compare the antioxidant benefit from MSM versus something like astaxanthin.

RB: Uhmmm…

DM: There may not be any, because it’s relatively new.

RB: None. And there are no per se side-by-side studies that do that. You know, you have your super fruits, the astaxanthin, and those kinds of studies.

DM: Astaxanthin isn’t really in fruits. It’s an extract from marine algae.

RB: Oh, okay.

DM: Haematococcus. It’s produced when these algae are stressed. It basically allows them to survive and go through very harsh conditions. It’s extracted out. And it seems to have an enormous benefit throughout the animal kingdom. It’s somewhat similar to the benefit of MSM in delayed onset muscle soreness. It’s actually being allowed in athletes to pursue quite incredible feats.

Salmon, being an example (which have some of the highest concentrations of astaxanthin), perform one of the most significant athletic feats in the animal kingdom, which is spawning and swimming upstream. It’s a ridiculous athletic feat, but they’re able to do it. Many of the scientists believe that’s a large part related to the astaxanthin. Because otherwise, with the oxidative stress and damage to the muscle tissue, they really couldn’t survive without some type of adjunctive support.

RB: Yeah. To my knowledge, there have been no side-by-side comparative studies of those. But you will see similar markers.

DM: Sure.

RB: Between some of them used in some of the MSM studies as you do in astaxanthin.

DM: Yeah. My guess and take is that they work synergistically. They perform similar functions, but definitely indeed distinct different functions. They both benefit each other. Ultimately, the way antioxidants work is to transfer electrons around.

RB: Right.
DM: Astaxanthin works a little bit differently. It absorbs it without an electron, but it essentially spares electrons. It keeps them in the body rather than consuming them, trying to eradicate these free radicals, which is one of the primary mechanisms. If you don’t have antioxidants, you get free radical damage, which really significantly impairs the function your DNA and your proteins.

RB: Right.

DM: The DNA makes the proteins, but ultimately it’s mediated through proteins. If your proteins aren’t working well, you don’t work too well.

RB: Right. I think with the MSM, it actually works more on an intercellular level. It’s mitigating the expression of reactive oxygen and nitrogen species. Once they’re made, MSM will not neutralize them per se. I think there’s a little bit of a different mechanism. And I like to say I really believe the two would work synergistically together.

DM: That’s terrific. I think that the challenge… Ultimately, I think – and it sounds that you would agree – that one of the primary mechanisms (although they’re still not well-elucidated this time) is that it may be serving as a source of sulfur, so our body can use this sulfur to create antioxidants like glutathione. But also for other structural proteins, where sulfur is an important component.

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RB: Yes.

DM: I don’t recall specifically, but I believe there are some non-essential amino acids that require sulfur. If you don’t have the sulfur as a building block, you can’t make them.

RB: Right. MSM is 34 percent sulfur by weight.

DM: Yeah. It wouldn’t be unreasonable to assume that it’s one of the main ways that it’s effective.

RB: Correct.

DM: Ideally, we’d like to get our sulfur from food if we can. That’s a bit of a challenge, because there’s been a transition or way from many traditional foods that really have been the big sources of sulfur, like collagen or keratin, that we just don’t eat too much nowadays. You can if you do bone broths and you cook down these bones, which have the connective tissue where the sulfur lies and dissolves into the water. Then you can drink the bone broth of the soup. But most of us don’t do that. This MSM seems to be a useful adjunct to rebuild those sulfur stores.

I’m wondering: are there any food sources of MSM, or is it just really available as a supplement?

RB: Well, MSM is in almost all raw foods. It’s in leafy green vegetables. Interestingly enough, there’s MSM in beer and coffee. Actually, it’s been identified as one of the main flavoring constituent in port wines.

DM: One of my favorites.
RB: It is naturally occurring in a number of foods. But a very interesting thing is that raw milk has actually the highest naturally occurring content of MSM.

DM: Interesting.

RB: There’s a study that was…

DM: Although when it’s been pasteurized, that MSM somewhat disappears?

RB: Yes. There’s actually a study that I came across. It wasn’t specifically looking at MSM. It was actually looking at all volatile sulfur compounds, because there is a – recognized by consumers – difference between the taste and odor of raw milk versus pasteurized milk. They were trying to determine what was the cause of that difference in taste and odor.

DM: MSM can be volatilized as a gas?

RB: Yes. The interesting thing is MSM is an extremely stable molecule from a chemistry standpoint. I don’t mean to bore you with it, but it’s a sulfur with two double-bonded oxygens and two methyl groups. For lack of a better way of saying it, it’s a very happy little molecule. It’s very stable.

DM: Stable.

RB: It’s stable to extremes of pH, temperature, and things like that. A lot would say, “Oh, well, you destroy MSM when you cook things.” You’re not destroying it. What happens is it volatilizes very easily. It’s just driven off. In ultra-high-temperature pasteurizations – because that’s what they looked at, UHT. They looked at the different [kinds]: skim milk, one percent, two percent, and 3.8 percent of homogenized milk. It actually cut the MSM content approximately by 50 percent.

DM: Interesting.

RB: By pasteurizing it. Essentially, that’s a flash heating process. In that short period of time that they did that, it drove off half of the MSM.

DM: That’s something similar that happens with vegetables when we cook them.

RB: Yes, because MSM is also very water-soluble. Think about it. When you’re cooking vegetables, generally steam is coming off. The MSM is carried off in the steam.

Plus, MSM has a unique property. It sublimes very easily. “Sublimation” is a technical word that basically means it can go from a solid to a gaseous form without going into that intermediate liquid phase. You think of ice, water, steam. Well, it’s like saying that you could go directly from ice to steam without going to the water phase in between. That’s kind of what happens with MSM. That’s why it’s easily removed in processing.

DM: It’s somewhat of a supportive argument for consuming raw foods or at least foods minimally processed.

RB: Yes. So, do you need to supplement with MSM? That would be… If you had…
DM: Before you answer that.

RB: Okay.

DM: Can you just give us an idea or a perspective of what type of concentrations we’re talking about? Even in raw milk, which you suggested as one of the highest concentrations of MSM.

RB: It is in part per million.

DM: How many milligrams would be in a quart of raw milk?

RB: Oh, goodness. To tell you the truth, I’d have to figure that out. I do know that…

DM: Is it like one milligram, 10, 20, or 100?

RB: See, because I know in quarts, and you’re talking English system going into metric. I know that it contains around eight parts per million. So, how many? I’d have to convert that into milligrams to say exactly how much you’re getting.

DM: About. Do you have any idea? Is it a milligram? Is it a hundred milligrams? Is it a tenth of a milligram?

RB: In a quart of milk?

DM: Or a glass of milk, whatever you might.

RB: In a glass of milk, you know. I really don’t know. But I’ll say, I’m going to figure it out. I’m sorry.

DM: Okay.

RB: I can’t answer that question.

DM: It just helps to put a better frame on it.

RB: Yeah. But it is basically trace amounts.

DM: Okay. Probably, less than a milligram.

RB: Yeah. I believe, you know, in looking… Bergstrom Nutrition’s brand of MSM has a lot of toxicity studies that have been done on it and whatnot. But as part of that, we had to do an evaluation based upon how much MSM is consumed in the average diet. Now, this is something that FDA uses. It’s looking at what is the average amount of raw vegetables…

DM: That would be useful [inaudible 36:00].

RB: Milk, and all of these different things. It was saying that at a maximum, you’re looking at about two to four grams of MSM consumed in a diet maximum in an average person.

DM: Is it per gram per day?
RB: Well, because the toxicity studies allowed us to go up, they were up at eight grams a day. We could consume two to three in functional food and beverage.

DM: So, it is common to get that many milligrams of MSM? What do you suggest?

RB: That’s the upper limit, okay?

DM: You could potentially get it.

RB: Potentially.

DM: That is interesting. So, there’s a significant amount of MSM in food therapeutically, or at least potentially, if you have the right types of foods that are high in MSM, assuming that they were – if it’s from vegetables, of course – grown in soil that has not only sulfur, but bioavailable sulfur, which has a lot more to do than just dumping it into the soil, because the microbes there have to digest it to make it available to the plants so they can incorporate into the tissue.

RB: Exactly.

DM: It’s just a big complex process. Then you have to have that, then you have to eat it, and then not cook the heck out of it. But you can get very therapeutic levels, I mean, in gram quantities.

RB: Yeah.

DM: According to the FDA. It wouldn’t be unreasonable to consider that if someone had a highly processed diet, or is, for some reason, consuming foods that really were devoid of this nutrient (because they weren’t grown properly), then it might make sense to consider adding something that was in the foods to begin with, which is MSM, in relatively high levels – gram quantities.

Because in a lot of supplements, we just take in microgram quantities, like selenium (actually one of the components of glutathione), which we believe MSM helps create. But you would never take a gram of selenium, unless you have a death wish.

RB: Right.

DM: But these, you’d have to take a few grams of MSM, because it’s really more of a food than it is a micronutrient.

RB: Yeah, correct. Toxicity studies have shown that MSM is extremely safe and that it can be taken at very, very high doses. Even if you have a very rich diet full of a lot of raw vegetables and things like that where you’re going to get a fairly large amount of MSM, you can still supplement and not hit that toxicity level. MSM is extremely safe.

DM: Can you provide us with some conditions that people might have? Before you answer that, let me just expand on this. If your diet is not optimized, it would probably make sense, considering all the well-known and recently appreciated benefits of sulfur’s importance in the human diet, which isn’t really widely known. Even the traditional clinical science or nutrition
doesn’t really focus on that at all. I don’t even know. It’s certainly not required to be in the label content with the sulfur content as a food.

It’s just not appreciated how important this is. But there’s an emerging consensus that we should probably put some focus on this. Because it was just assumed that we weren’t deficient in it, but that may not be the case. So, there’s this whole justification that people could use to consume it as an additional source, if they weren’t getting an optimized diet.

But then there’s also another segment of the population who may have some clinical condition, where additional sources of sulfur like MSM may be therapeutic. Could you provide us with a list of those conditions, where if people have these, they might consider using some supplemental sulfur sources?

[----- 40:00 -----]

RB: Well, a lot of chronic inflammatory conditions – fibromyalgia, even chronic fatigue syndrome, people that are suffering from aches and pains. I mean, a lot of those kinds of conditions, I believe, would potentially benefit from MSM.

I think we all have been subject to [all kinds of conditions], you know, [where] you kind of sit around. Most people are less active through the winters. When spring time comes around, you’ve got to go out. You’ve got to start putting in the garden and doing that kind of work. You end up with sore muscles and things like that. MSM can definitely… Even the clinical evidence shows that MSM helps prevent those sore muscles and achy joints.

But it also seems to be preventative. I remember I was talking about the protection from oxidative damage. Now, oxidative damage can lead to premature aging and again to low-level chronic inflammation, which can lead to those diseases. You say, what conditions is it good for? I really think everybody can benefit from it (because the data suggests its potential preventative effect), so that you don’t end up with these kinds of conditions.

DM: Yeah. I think that’s probably wise overall. I’m not sure that it’s the same mechanism for some of the disease you mentioned, like fibromyalgia or chronic fatigue, which probable don’t have necessarily an inflammatory component. It’s more of an autoimmune issue going on that needs to be re-regulated. But certainly, inflammatory conditions like most arthritis, and possibly even autoimmune diseases, but through a different mechanism like optimizing different pathways where sulfur was deficient.

And then certainly, people who are suffering from toxicity, because glutathione, as you mentioned, really requires sulfur. If there’s sulfur deficiency, your body’s not going to make enough. Glutathione is absolutely essential for removing heavy metals and many of the toxins that they were exposed to. However, it’s not just simply glutathione. There are many other variables that need to be addressed in addition to that. You just can’t optimize magically your glutathione levels and expect to get better.

It’s really part of a whole comprehensive approach. As part of a comprehensive approach, it can be a very important tool.

RB: Yeah, definitely.
DM: Can you discuss some of the dosages that one might consider? Is there a need to start this at a lower rate because of some type of buildup that needs to occur? Or can one just go into it? Maybe we can review the dosaging.

RB: Each individual is a little bit different. The effective amounts in the clinical studies do show from about one and a half grams on to about six grams for effective dose. But some people have had mild adverse events, which would be minor intestinal distress. Some have had swelling of the ankles, and maybe a mild skin rash, which would be like a detoxifying effect. That can usually be mitigated or minimized by cutting back on the initial dosage.

Of course, in that case you might want to start out with half a gram, so 500 milligrams for a couple of weeks and then slowly increase until you get up to the desired dose.

DM: How does MSM become packaged typically? Five hundred milligrams or half a gram?

RB: Generally, in tablet or capsule form. You see anywhere from 750 or 500 up to a thousand milligrams.

DM: Okay. It’s usually swallowed as a capsule. I believe one could take MSM and dissolve it in water. It doesn’t dissolve completely, but it does dissolve. But there’s probably a significant taste issue there.

RB: There can be. I know that you can take a teaspoon, which is roughly three grams, and put it in an eight-ounce glass of water. It has very small impact on the taste. I do know people that have trouble swallowing. Because MSM has been used quite a bit in elderly population, and a lot of them have trouble swallowing pills.

DM: Sure.

RB: I have advised a lot of them to use [MSM] powder in their favorite beverage. Generally, if you’re using eight ounces of liquid, you can get up to three grams dissolved fairly easily.

DM: When did MSM first become popular? Was it in the mid-90s or so? Or ‘80s?

RB: Well, it was initially recognized in the mid-80s by the work of Robert Herschler. But it really started moving into the human usage in the late ‘90s, about 1997, 1998, to 1999.

DM: Now, there are a number of different places or manufacturers that produce MSM. Like anything – any supplement or any food – quality is a major issue. Because in the production of supplements specifically, there’s a lot of opportunity for introduction of mistakes, errors, or inferior-quality raw materials that produce things. I’m wondering if you can give us any cautions, concerns, or guidelines that one could use to identify a company that’s producing high-quality MSM.

RB: Well, there are different methods of purification of MSM.

DM: If there’s a purified form, what’s the raw material that it’s being purified from?

RB: The raw material is made from DMSO.

DM: Okay. You take DMSO.
RB: DMSO.

DM: And where does the DMSO come from?

RB: DMSO is manufactured from DMS, dimethyl sulfide.

DM: Okay.

RB: So, you have those three compounds, which are dimethyl sulfur compounds that are kind of a family of compounds all tied together as part of the Earth’s natural sulfur cycle and whatnot. Essentially, when we make MSM, we’re more or less doing it in the same manner that it’s done in nature. In nature, DMS – dimethyl sulfide – is produced in the oceans by phytoplankton and algae. It’s a very volatile compound. It rises up in the atmosphere.

DM: Is that also produced in volcanoes? Or is that hydrogen sulfate?

RB: That’s hydrogen sulfide generally. But the DMS goes up into the atmosphere, where it comes in contact with the ozone and high-energy ultraviolet light. It actually oxidizes the DMS to DMSO and DMSO2, which is MSM. That’s synonymous.

DM: Okay.

RB: Then it comes back to the Earth as rain. That’s the Earth’s natural sulfur cycle. And that’s essentially the way it’s made.

Now, the key is the purification of that. It’s best if it’s purified by distillation. Engineering handbooks on different ways of purification, there are two main ones: crystallization and distillation. Distillation is by far superior.

DM: There are some companies that use the former approach, because it’s less expensive.

RB: Yeah, crystallization, a lot less energy-intensive. But a lot of the problems with that is you’re essentially crystalizing it out of a parent solvent or liquid. If there are any impurities, which could be salts of heavy metals, you could have aromatic hydrocarbons in that… It’s actually the parent solvent. It’s usually water. It is dependent upon water quality.

Anyway, when those crystals form, they form what they call occlusions, which are imperfections within the crystals, where these impurities could be entrapped, and you end up with less pure MSM. By distillation, essentially, it’s like distilling water. You drive it off in its gaseous phase and then condense it back into its solid phase.

DM: A lot of pure product.

RB: Oh, yeah.

DM: What percentage of companies would use crystallization, which has much potential for contamination and an impure product versus the distillation?

RB: Actually, there is probably about, I’d say, 70, well… There are two companies that actually use distillation.
DM: So, two companies making MSM that produces [it through distillation]. Almost everyone else uses crystallization?

RB: Everyone else uses crystallization as a method of purification, yes.

DM: Okay. If someone is seeking to find a source of MSM, you need… Many of these are sort of privately labeled or branded, but you have to ultimately go back to where they're buying their source from, and then find out if, in fact, it was crystallized or distilled.

RB: Correct.

DM: Okay. And there are only two companies that use distillation?

RB: Yes. Actually, one provides approximately about 80 percent of the U.S. domestic market and probably about 65 to 70 percent of the international market. They provide MSM.

DM: Okay. So, it’s the big player. You want to make sure…

RB: It’s definitely the big player. They’re also a single-purpose facility. The nice thing about that is there is absolutely no danger of cross-contamination of other products, because all of the plumbing within that facility is dedicated strictly to MSM production.

DM: Okay. Are there any other criteria that you should look for when you’re seeking to purchase MSM?

RB: Just look in to make sure that you have efficacious dosage on it. Other than that, it’s basically making sure that it’s purified.

DM: Purified from distillation.

RB: Purified from distillation.

DM: Now, we talked initially when we first started the discussion about Stanley Jacob and him essentially being the father of this whole field.

RB: Correct.

DM: And developing the whole process and the science behind it. He’s really looked at as one of the major pioneers. But I believe he has only sort of endorsed or has come to work with one company producing MSM. Is that correct?

RB: That is correct. He endorses… The branded name of the ingredient is OptiMSM (it’s kind of a play on “optimism,” I guess), and is produced by Bergstrom Nutrition.

DM: Okay.

RB: He’s on the staff as one of their medical advisors.

DM: Okay.
RB: Still.

DM: Good.

RB: Yeah.

DM: Is this Bergstrom Nutrition the one that does the distillation?

RB: Correct.

DM: And the one that is the major supplier of MSM in the world?

RB: Yes.

DM: Okay. Probably, if you’re going to be choosing to use this – what appears to be a very highly beneficial, very safe, non-toxic supplement – you want to get one that has the OptiMSM from Bergstrom Nutrition.

RB: Correct.

DM: Stay away from ones made from crystallization. They may be okay, but you don’t know. You’re just like rolling the dice. You just… It doesn’t make sense to use an inferior quality if you’re going to make the commitment. And probably, the price difference is minimal.

RB: Yeah. It would be for, you know.

DM: This final product.

RB: Yeah, the final product [inaudible 52:19] consumer.

DM: The pennies, you know.

RB: Exactly. Pennies per dose at the most.

DM: Well, that’s great. Are there any other comments you’d like to make about MSM? Its therapeutic benefits? Or elaborate any further points that you’d mentioned earlier?

RB: I think we’ve covered it quite well. I think that’s good unless if you have any other questions for me that you’d like me to elaborate on.

DM: I think it’s really exciting. As I’ve said (and I want to reinforce), sulfur is the emerging stealth player in nutrition and for a variety of mechanisms that appears to be working through [not only] detoxification, but also as an anti-inflammatory.

Glutathione is just… I mean, it’s just so widely appreciated that it’s so foundationally essential to have a good or a highly functioning glutathione system. If you don’t have enough sulfur in your diet, you’re not going to be able to have that. That’s one mechanism, but then also just from the general structure of proteins.

I mean, because of the progressively decreasing quality of the vast majority of the people in Western countries, their ability to consume sulfur – typically in the form of MSM in their diet and in the form of raw foods – is decreasing and has been decreasing for decades. It would make
sense that if you’re suffering from this decrease in normal sulfur that you would get from your diet, supplementing with something that’s relatively safe and relatively inexpensive would seem to make a lot of sense.

It’s one that should be considered. It’s not one that we’ve recommended before, but that’s because we’re like many others – kind of somewhat late to the game in really fully appreciating the benefits and the importance of sulfur. We’re still light years ahead of the traditional clinical nutritionist, who are basically clueless about the awareness at least of sulfur deficiency, which I think will change.

Very similar to vitamin D deficiency, which was essentially absolutely just not appreciated until this century, largely because of the technology we had to measure it clinically. It was just research before; it wasn’t really known how widely deficient people were in vitamin D. But that’s a really good example. I mean, now everyone knows we need vitamin D. It’s just widely appreciated. But not too long ago – 15 years ago for sure, maybe 12 years ago – virtually everyone was clueless about this.

I think we’re going to see a similar transition with sulfur. I don’t know if it’s going to be as rapid or as widely adopted, but I really think we’re going to move in that direction. I’m excited. I think it has an enormous potential. It’s something that should be seriously considered if inflammatory conditions or detoxification especially is a challenge. Or if you have a mystery illness that you to seem to be doing everything right, but not getting better. It’s certainly virtually side-effect-free and certainly inexpensive enough to give it a try.

RB: Yeah. I definitely agree.

DM: Well, thank you for joining us. I appreciate your time, effort, energy, and all your efforts to help bring this product to the market.

RB: Well, thank you for having me. I appreciate the opportunity to come and talk about MSM.

DM: Okay. All right.

[END]